

# **Sleep and cardiometabolic risk: a cluster analysis of actigraphy-derived sleep profiles in adults and children**

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**Abstract:**

**Study objectives:** Sleep plays an important role in cardiometabolic health. While the importance of considering sleep as a multidimensional construct is widely appreciated, studies have largely focused on the role of individual sleep characteristics. The association between actigraphy-derived sleep profiles and cardiometabolic health in healthy adults and children has not been examined.

**Methods:** This study used actigraphy-measured sleep data collected between February 2015 and March 2016 in the Child Health CheckPoint study. Participants wore actigraphy monitors (GENEActiv Original, Cambs, UK) on their non-dominant wrist for seven days and sleep characteristics (period, efficiency, timing and variability) were derived from raw actigraphy data. Actigraphy-derived sleep profiles of 1,043 Australian children aged 11-12 years and 1337 adults were determined using K-means cluster analysis. The association between cluster membership and biomarkers of cardiometabolic health (blood pressure, body mass index, apolipoproteins, glycoprotein acetyls, composite metabolic syndrome severity score) were assessed using Generalised Estimating Equations, adjusting for geographic clustering, with sex, socioeconomic status, maturity stage (age for adults, pubertal status for children) and season of data collection as covariates.

**Results:** Four actigraphy-derived sleep profiles were identified in both children and adults: *Short sleepers*, *Late to bed*, *Long sleepers*, and *Overall good sleepers*. The *Overall good sleeper* pattern (characterised by adequate sleep period time, high efficiency, early bedtime and low day-to-day variability) was associated with better cardiometabolic health in the majority of comparisons (80%).

**Conclusion:** Actigraphy-derived sleep profiles are associated with cardiometabolic health in adults and children. The *Overall good sleeper* pattern is associated with more favourable cardiometabolic health.

**Key words:** Sleep, children, profiles, cardiometabolic health

### **The Statement of Significance**

While the importance of understanding the multidimensional nature of sleep is widely recognised, few studies have examined sleep as a multidimensional construct. This is the first study to determine the association between actigraphy-derived sleep profiles and cardiometabolic health in a community sample of adults and children. Four actigraphy-derived sleep profiles were examined *Short sleepers*, *Late to bed*, *Long sleepers*, and *Overall good sleepers*. The *Overall good sleeper* pattern is associated with more favourable cardiometabolic health (blood pressure, body mass index, apolipoproteins, glycoprotein acetyls, composite metabolic syndrome severity score). Four characteristics of sleep examined (sleep period, midsleep, sleep efficiency, day-to-day variability) appear to play an important role in cardiometabolic health. Future efforts to improve population sleep need to consider all characteristics of sleep, rather than isolated variables.

## **Introduction:**

Cardiometabolic diseases are the leading cause of morbidity, mortality, and disability.<sup>1,2</sup> Several public health initiatives have been proposed and initiated to improve the detection, prevention and treatment of cardiometabolic risk factors, including obesity, hypertension, elevated blood glucose and cholesterol levels, and elevated inflammatory markers.<sup>1</sup> While lifestyle behaviours, such as physical activity and diet, have long been recognised as important modifiable risk factors of cardiometabolic disease, sleep has recently been suggested as an equally important, modifiable risk factor.<sup>3,4</sup>

Sleep is thought to play an important role in regulating complex physiological processes that are critical for maintaining metabolic homeostasis.<sup>5</sup> Short sleep duration, poor sleep quality, delayed sleep timing and variable sleep patterns are thought to adversely affect diet, activity levels and processes occurring in the hypothalamic–pituitary–adrenal axis (HPA), resulting in increased oxidative stress, systemic inflammation, endothelial dysfunction and sympathetic systemic activation.<sup>6-8</sup> These changes manifest as raised inflammatory markers, hypertension, dyslipidemia and obesity, which are all known to increase cardiovascular risk. Given that cardiometabolic risk factors track into adulthood,<sup>9-11</sup> it is important to understand how sleep may be associated with these risk factors both in adults and children.

A number of methods have been used to assess cardiometabolic risk in adults and children.<sup>12-16</sup>

Several studies use a “metabolic syndrome score”, a composite score of multiple biomarkers reflective of cardiometabolic risk. While there is currently no universal definition, Eisenmann<sup>16</sup> provides recommendations on a continuous score, which can be used for both adults and children. It

has been shown to track from childhood to young adulthood<sup>17-20</sup> and predict the development of type 2 diabetes and cardiovascular disease (CVD) morbidities in adulthood.<sup>21, 22</sup> Other cardiometabolic risk factors such as obesity, blood pressure, certain inflammatory markers (e.g. glycoprotein acetyls [GlycA]) and dyslipidemia (i.e. apolipoprotein B/A1 ratio [Apo B/A1]) are also of interest. This is particularly because these biomarkers are independent predictors of cardiometabolic diseases<sup>23, 24</sup> and track into adulthood.<sup>20</sup>

While body mass index (BMI) and blood pressure, measured in terms of systolic and diastolic blood pressure, are well-known measures of cardiovascular risk, GlycA and ApoB/A1 are relatively new and novel biomarkers, with few studies investigating links with sleep.<sup>25-27</sup> High sensitivity C-reactive protein (hsCRP), which is commonly examined in sleep studies, is a marker of acute and (in adults) chronic inflammation. A recently described composite nuclear magnetic resonance (NMR) marker, GlycA, is suggested to better reflect chronic inflammation and in adults is predictive of cardiometabolic risk, however, there are few data from children and adolescents.<sup>28, 29 30</sup> Recent studies also suggest GlycA is a strong predictor of future cardiovascular events,<sup>24, 31</sup> incident type 2 diabetes mellitus,<sup>32</sup> and overall mortality,<sup>24</sup> beyond traditional measures of inflammation, such as hsCRP.<sup>33</sup> Apolipoproteins are structural and functional proteins of lipoprotein particles (e.g. LDL, HDL, vLDL) that have an important role in lipid metabolism.<sup>34</sup> ApoB/A1 reflects the ratio of apolipoprotein A (the largest structural component of HDL and responsible for reverse cholesterol transport) and apolipoprotein B (the largest structural component of LDL and responsible for circulating cholesterol transport), and has been suggested to more accurately reflect cholesterol balance and potential atherogenic and anti-atherogenic particles.<sup>34</sup> ApoB/A1 ratio has been reported an important predictor of cardiovascular risk, superior to conventional lipid profiles and tracks from childhood to adulthood.<sup>35</sup>

To date, few studies have examined the association between sleep and cardiometabolic risk, with most studies adopting a variable-based approach, and almost all focusing on sleep duration.<sup>25</sup> While traditional variable-based approaches may provide insight into how isolated sleep characteristics are associated with cardiometabolic risk factors, analyses do not reflect the multidimensional nature of sleep. Given that sleep is a multidimensional construct, it is essential to adopt a “whole person approach” that considers all characteristics of sleep within the individual, particularly when considering population health.<sup>36</sup>

In line with efforts to better understand sleep as a multidimensional construct and as a determinant of cardiometabolic health, the current study aimed to determine the association between actigraphy-derived sleep profiles and cardiometabolic health of Australian children aged 11-12 years and their parents. In this study, we examined cardiometabolic health in terms of BMI and blood pressure, a continuous cardiometabolic risk score, and biomarkers of inflammation (GlycA) and dyslipidaemia (ApoB/A1).

### **Methods:**

Data examined in this study were collected between February 2015 and March 2016 as part of the Child Health CheckPoint (CheckPoint) study, a one-off, comprehensive physical health and biomarker cross-sectional study nested between waves 6 and 7 of the Longitudinal Study of Australian Children (LSAC) at child age 11-12 years. The LSAC commenced in 2004 with the recruitment of two cohorts (B and K – the latter not relevant to this paper), which have since been

followed biennially<sup>37</sup>. Further details of the CheckPoint study design and recruitment are outlined elsewhere.<sup>38,39</sup>

**Ethics and Consent:** The CheckPoint study protocol was approved by The Royal Children's Hospital Melbourne Human Research Ethics Committee (33225D) and the Australian Institute of Family Studies Ethics Committee (14-26). The attending parent/caregiver provided written informed consent for themselves and their child to participate in the study.

### **Measures:**

#### *Sleep*

Objectively-measured sleep characteristics were collected using tri-axial, wrist-worn GENEActiv accelerometers (Activinsights, Cambs, UK). This device has been used in previous studies to examine sleep of adults<sup>40</sup> and children.<sup>41,42</sup> The GENEActiv has been shown to be valid for measuring sleep duration and efficiency when compared to the Actiwatch<sup>43</sup> and polysomnography<sup>40</sup> in adults, but not in children. GENEActiv-measured sleep duration correlate well with both sleep diary and self-reported sleep durations in children.<sup>44</sup> Participants were included for analysis if they had at least four nights of sleep data recorded, had an average sleep time >200 min and at least one non-school night (Fri-Sat) of sleep data. Sleep characteristics were derived from raw accelerometer data and processed using *Cobra* custom software developed by co-author FF (available on request to FF). Details of data processing have been reported elsewhere.<sup>45</sup> The van Hees<sup>40</sup> sleep algorithm was used to detect sleep and wake between self-reported bedtime and get up time, and collapsed into 1-min epochs. Each minute was classified as sleep or wake if it contained a majority of sleep or wake 5-s epochs, respectively. Minutes containing equal numbers of sleep and wake 5-s epochs were classified as sleep. Sleep onset was defined as the start of the first three consecutive minutes scored

as sleep. Sleep offset was defined as the end of the last five consecutive minutes scored as sleep. Sleep data for the first night were excluded, as recordings started at 2300. Further details of sleep data processing has been reported elsewhere.<sup>45-47</sup>

Four actigraphy-derived sleep variables were used to develop sleep clusters. These included sleep period (the difference between sleep onset and offset), sleep timing (the midpoint between sleep onset and offset), day-to-day sleep variability (the coefficient of variation of sleep period) and sleep efficiency (the percent of minutes scored as sleep between onset and offset). These variables are poorly correlated (a requirement of the cluster analysis<sup>48</sup>) and were selected to represent sleep duration, timing, variability and quality (respectively). K-means cluster analysis was then used to identify sleep clusters. This process, summarized in the methods section and reported in detail elsewhere,<sup>47</sup> identified four sleep clusters that were labelled *Late to bed*, *Long sleeper*, *Short sleepers*, and *Overall good sleepers* for both adults and children within the CheckPoint study.

### *Cardiometabolic health*

We examined whether sleep cluster membership was associated with cardiometabolic health, considered in terms of cardiometabolic markers, anthropometric measures and a composite metabolic syndrome score.

### *Cardiometabolic markers*

Semi-fasted venous blood samples were taken from consenting adults and children in the CheckPoint study. In some cases, participants declined to provide venous samples but provided capillary blood samples instead. Appropriately trained researchers or phlebotomists collected venous blood samples within assessment centres. Samples were then processed within 2 h on-site and stored at  $-80^{\circ}\text{C}$  prior



to shipping in dry ice as a single batch to the Melbourne Children's Bioresource Center (Murdoch Children's Research Institute) for processing. Further detail of blood collection, storage, and processing has been reported elsewhere.<sup>49</sup> Biomarkers examined in this study included concentrations of triglycerides, total cholesterol, HDL, LDL, ApoB/A1 and GlycA. Further detail as to how these measures were derived have been reported elsewhere.<sup>29</sup>

### *Anthropometric measures*

Waist circumference was measured by trained research assistants with a steel anthropometric measuring tape (Lufkin Executive Diameter W606PM, Maryland) and assessed as the narrowest point between the 10th rib and iliac crest, or midpoint between if no visible narrowing. Two measures were taken, or a third (if the first two values differed by  $\geq 1$  cm), and the average was calculated. Height was assessed using a portable rigid stadiometer (Invicta IP0955, Leicester, UK). Two measures were taken, or a third (if the first two values differed by  $\geq 0.5$  cm), and the average was calculated. Weight was recorded via the InBody 230 Bioelectrical Impedance Analyser scales.<sup>50</sup> BMI ( $\text{kg}/\text{m}^2$ ) was determined and BMI z-score calculated for children using the Centers for Disease Control CDC reference dataset<sup>49</sup>. Waist circumference measures have been shown to have good intra-rater and inter-rater reliability  $>0.88$ .<sup>51-53</sup> Similarly, the intra-rater and inter-rater reliability of BMI measures have been shown to be greater than 0.90.<sup>54</sup>

### *Blood pressure*

Blood pressure was measured by a trained research assistant. Blood pressure cuff size was selected based on arm circumference. Readings were taken using the SphygmoCor<sup>55</sup> automated blood pressure monitoring device after participants were seated for a minimum of three minutes of quiet

rest. Automated blood pressure recordings in children, following similar protocols adopted in this study have been shown to have good intra-rater reliability ( $r=0.83-0.86$ ).<sup>56</sup>

Three blood pressure measures were considered: systolic blood pressure (SBP), diastolic blood pressure (DBP) and mean arterial pressure (MAP). Mean arterial pressure was determined using the following calculation:  $MAP = [SBP+(2*DBP)]/3$  and was used to calculate a metabolic syndrome score.

#### *Metabolic syndrome severity score*

The metabolic syndrome is a cluster of cardiovascular risk factors that identify individuals who are more likely to develop future CVD and Type 2 diabetes.<sup>21, 57</sup> While there is no standard method of assessing metabolic syndrome, methods that use binary cut-offs have been criticised, with growing research in favor of z-score calculations.<sup>58</sup>

In the current study, a metabolic syndrome severity score (MetSS) was calculated to reflect metabolic syndrome severity. In line with Eisenmann's recommendations,<sup>16</sup> we used the sum of the z-scores of MAP, triglycerides, glucose, waist circumference, and HDL. Since HDL is inversely related to metabolic risk, it was subtracted. A higher score indicates a less favorable cardiometabolic profile. While an age- and sex- adjusted metabolic syndrome severity score has been recommended,<sup>16</sup> we used an unadjusted score as our analysis adjusted for sex, children's puberty stage, and adult's age.

#### *Covariates*

Analyses were adjusted for socioeconomic position (SEP), sex, parental age, children's puberty stage and season of data collection. SEP was operationalised using a composite measure consisting of self-

reported parental income, education and occupation, which was derived from the LSAC dataset.<sup>59, 60</sup> Using this scale, higher scores represent higher socio-economic position. Puberty was assessed using the Puberty Development Scale, a validated questionnaire that requires participants to answer five questions, using a four-point scale, with higher overall score representing advanced pubertal development.<sup>61, 62</sup> Season of data collection included all four seasons of the year: Summer (December-February), Autumn (March-May), Winter (June-August), Spring (September-November), as defined in Australia. These covariates were selected as they have been associated with cluster membership and cardiovascular outcomes.<sup>47</sup> The primary sampling unit of the original (LSAC) cohort was postal code, therefore we included an indication of which participants belonged to the same postal code.

### **Statistical Analysis:**

All actigraphy variables were computed for each day. Measures of sleep duration, timing and quality, were averaged using a 5:2 weighting for a weeknight (Sunday–Thursday) and weekend (Friday–Saturday).

Details on how sleep clusters were developed have been reported elsewhere.<sup>47</sup> Briefly, cluster analysis was performed for both adults and children separately using SPSS, Software version 25 and guided by methods outlined by Mooi and Sarstedt<sup>48</sup>. Sleep variability data were normalised using log transformation and all sleep values standardised (using z-score) prior to analysis. The agglomerative hierarchical clusters method (using Ward’s method and squared Euclidean distance) was used to help determine the number of clusters. K-means cluster analysis was then used to determine specific sleep clusters. Given that cluster analysis is primarily exploratory in nature and practical considerations have been suggested to be of utmost importance when deciding on the

number of clusters,<sup>48</sup> we selected the optimal number of clusters by visualizing the hierarchical cluster dendrogram and considering the coefficient change in the hierarchical agglomerative schedule (Supplement 1), as well as the interpretability of K-means cluster solutions. Stability of clusters was assessed following the common approach outlined by Mooi and colleagues<sup>48</sup>; whereby we repeated the cluster analysis on a random split of the original sample and compared the cluster centroids of the two solutions. One-way ANOVA did not find a significant difference in cluster centroids (p-value 0.7 for children and 0.176 for adults), suggesting a high degree of stability in the overall solution..

Cardiometabolic markers were examined for normality through visual inspection of histogram plots and assessment of kurtosis. Skewed variables were assessed by visual inspection, assessment of kurtosis (>3) and skewness (>1) values and were normalised using log transformation (glycA for adults; glycA and ApoB/A1 for children). All outcome variables were standardised prior to analysis.

The association between sleep cluster membership and cardiometabolic risk was assessed using Generalised Estimating Equation (GEE) in which standardised cardiometabolic risk measures were considered as dependent variables and cluster membership as predictor. Robust standard errors were used to account for the clustered sampling design of the study by adjusting for geographic clustering of observations by postal code. All outcome measures were normally distributed and modelled using a linear model, adjusted for sex, SEP, maturity stage (age for adults, puberty score for children) and season of data collection. P-values have been reported. Since many comparisons were undertaken, Holm Sequential Bonferroni correction was performed to address the risk of capitalisation on chance.

## **Results:**

As presented in Figure 1, of the 1874 parent-child CheckPoint participants, 1043 children and 1337 adults had complete sleep data available for cluster analysis. Table 1 presents a comparison of participants included and excluded for analysis. As shown, children included for analysis were younger, had less advanced pubertal status, were of higher SEP and lower BMI z-score compared to those excluded. Similar differences were observed for adults, except, those included for analysis were older than those excluded. There were no sex differences.

Table 2 presents sample characteristics. Most participants were born in Australia and spoke English at home. Few were of Indigenous background. Sleep characteristics of the four actigraphy-derived sleep profiles examined are reported in Table 3. As presented, each cluster was named according to key sleep characteristics. Cluster names are provided as mnemonic labels only. Further details of sleep clusters and correlates have been reported elsewhere.<sup>47</sup>

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Adjusted GEE results for adults and children are presented in Table 4. As shown, cluster membership was significantly associated with MetSS, BMI and ApoB/A1 in adults and MetSS in children. Compared to *Overall good sleepers*, adults with a *Late to bed* sleep profile had a higher MetSS and BMI, while children with a *Short Sleep* profile had significantly higher MetSS, BMI and ApoB/A1. Adjusted marginal means are presented in Table 5

Figure 2 illustrates cluster membership and adjusted, standardised effect sizes for each cardiometabolic outcome measure. As shown, the *Overall good sleeper* pattern is associated with better cardiometabolic health in both adults and children. As illustrated, effect sizes are generally larger for adults, compared to children.

<<Insert Table 4 here>>

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## **Discussion:**

This is the first study to determine the association between actigraphy-derived sleep profiles and cardiometabolic risk in a community sample of adults and children. We examined cardiometabolic risk in terms of a continuous metabolic syndrome severity score, as well as traditional and novel biomarkers that have been shown to track into adulthood and predict the development of type 2 diabetes and CVD morbidities in adulthood.<sup>20-24</sup> We found that *Overall good sleepers* had better cardiometabolic health across a variety of individual and summary cardiometabolic indicators in both adults and children. The differences were most pronounced for MetSS in both adults and children, and for BMI and ApoB/A1 levels in adults.

In our study, we found that MetSS (and to a lesser extent other cardiometabolic risk factors) was worse in the short sleep group in children and the late sleep group in adults. Short sleep and delayed sleep timing have been associated with poorer cardiometabolic health.<sup>25, 36, 63-65</sup> Short sleep is thought to increase allostatic load, increase appetite for unhealthy foods and cause fatigue, which limits physical activity.<sup>66, 67</sup> In contrast, delayed sleep timing is thought to provide fewer opportunities for physical activity, greater opportunities for sedentary behaviours and may also be a marker of a generally chaotic lifestyle.<sup>63, 68</sup> This may explain why the *Late to bed* adults (perhaps busy parents of children) in our sample are particularly prone to less favourable cardiometabolic health. These findings have important implications when considering sleep interventions to help improve

cardiometabolic health- while it is important to consider all sleep characteristics, short sleep duration in children and delayed sleep timing in adults may be of particularly importance.

### **Previous studies and interpretation of results**

Studies examining the association between sleep and cardiometabolic risk in non-clinical samples have typically adopted a variable-based approach and examined the role of isolated, or at the most two or three, often subjectively-measured sleep characteristics.<sup>36</sup> Nevertheless, previous studies that have examined the role of sleep duration, quality, timing and variability tend to support findings in the current study. That is, sleep is a multidimensional construct and all characteristics of sleep are likely to play an important role in cardiometabolic health.

Short sleep duration is thought to adversely affect cardiometabolic health via a number of mechanisms. One theory suggests that short sleep increases allostatic load and disrupts processes occurring in the hypothalamic–pituitary–adrenal axis and the autonomic sympathetico-adrenal system. This results in increased cortisol and catecholamine release, oxidative stress, systemic inflammation, endothelial dysfunction, sympathetic systemic activation and subsequent hypertension, dyslipidemia and obesity.<sup>6, 7</sup> Another theory suggests that short sleep simply results in more time awake, particularly at night, and therefore greater time exposed to psychological stressors and unhealthy behaviours such as snacking on high-calorie foods, excess caffeine consumption and sedentary screen-time activities.<sup>69</sup> Supporting these hypotheses, systematic reviews suggest short sleep is associated with increased risk of metabolic syndrome<sup>70</sup> in adults and adiposity<sup>25, 71</sup> and hypertension<sup>65, 72</sup> in both adults and children. While some studies report an association between short

sleep duration and unfavourable blood lipid profiles and raised inflammatory markers, systematic reviews are yet to support this association.<sup>25, 65</sup>

Sleep quality, such as sleep duration, is thought to play an important role in mediating inflammatory processes and regulating catecholamine and growth hormone levels.<sup>11, 73</sup> Poor sleep quality has been associated with obesity,<sup>74</sup> hypertension<sup>11, 75</sup> and metabolic syndrome.<sup>76</sup> However, sleep quality has been defined in a variety of ways including validated questionnaires, subjective rating scales and objective measures of sleep efficiency. Consistent with our measure of sleep efficiency, Feliciano and colleagues,<sup>64</sup> in a study of 829 adolescents aged 13 years, reported higher sleep efficiency was associated with a more favorable cardiometabolic profile, measured in terms of a metabolic risk score, systolic blood pressure and HDL cholesterol levels.

Sleep timing and variability are also thought to play an important role in cardiometabolic health. Observational studies consistently suggest that findings that shift workers are at an increased risk of cardiometabolic disease and deranged cardiometabolic markers are attributable to variable sleep schedules and circadian misalignment (i.e. sleep timing).<sup>77</sup> Poor sleep timing has also been shown detrimental to children's health. For example, Olds and colleagues,<sup>68</sup> in a study of 2200 Australian children and adolescents, reported later bedtimes and rise time were associated with higher BMI, independent of sleep duration. The authors hypothesised that delayed sleep timing provided fewer opportunities for physical activity and greater opportunities for sedentary behaviours and increased calorie consumption (i.e. staying up late at night watching television and eating snacks). Indeed, Golley and colleagues,<sup>63</sup> in a study of the same 2200 Australian children and adolescents, reported delayed bedtimes were associated with a higher intake of energy-dense, nutrient-poor foods.

To date, there are no studies, that we are aware of, that have applied cluster analysis to determine the association between sleep profiles and cardiometabolic health in adults and children. Although some studies attempt to decipher how different sleep characteristics are associated with different health outcomes, they generally only examine the effects of two or three different sleep characteristics, which are often measured subjectively.<sup>36</sup> Of the few available studies<sup>25, 64</sup> that have examined multiple characteristics of sleep, findings are consistent with the current study, that multiple characteristics of sleep may be important for health.

### **Strengths and limitations**

To our knowledge this is the first population-based study to examine the association between actigraphy-derived sleep profiles and cardiometabolic health of adults and children, using objective, free-living sleep measures of duration, timing, quality and variability. Strengths include the objective examination of sleep via actigraphy and assessment of a wide range of standard and novel biomarkers in a large number of adults and children, as well as accounting for children's pubertal stage, seasonal influences and sampling clustering. However, there are several methodological issues that also need to be considered. Firstly, although the GENEActiv monitor has been shown valid for measuring sleep when compared to polysomnography in adults,<sup>40</sup> there are as yet no studies that have validated the monitor against polysomnography in children. Secondly, the narrow age range for children (11-12 years) precludes generalisation to other childhood ages and SEP. Thirdly, this study is cross-sectional and hence we are unable to infer causality. Fourth, we examined sleep clusters based on four sleep characteristics (duration, timing, variability and quality), each operationalised by a single variable (sleep period, midsleep, coefficient of variation and sleep efficiency). While this is a standard approach, it must be noted that there are a number of potentially different sleep characteristics and variables that may be assessed (e.g. number of night-time awakenings). Further,

although clusters were developed using a heuristic approach, guided by a recent review which suggested sleep duration, quality, timing, and variability are important sleep characteristics for the of health children,<sup>25</sup> a model-based approach could have also been used.<sup>36</sup> This study only examines adults and children in the CheckPoint study who had complete sleep data available and who agreed to have blood samples take, blood pressure assessed and/or body mass index calculated. It is also important to note that participants included in the current study were Australian children aged 11-12 year and adults (mean age 43 years), who were of higher SES and lower BMI compared to those excluded from the analysis. Results are therefore no longer representative of Australian children (aged 11-12 years) and their parents and cannot used to make generalisations to other childhood and adult age groups as well as other cultures and SES groups. Lastly, we acknowledge that testing more than one hypothesis increases the chances of significant findings. While there are tests to correct for multiplicity, they were not appropriate for the current study as outcomes were correlated.

**Meaning and implications for clinicians and policy makers and areas in need of future research:**

The findings of this study suggest that *patterns* of sleep (sleep period, quality, timing and variability) play an important role in cardiometabolic health. An *Overall good sleep* pattern is desirable for favourable cardiometabolic health. For example, compared to *Overall good sleepers*, adults in the *Late to bed* group was associated with a 0.29 SD increase in BMI (approximately 1.7 kg/m<sup>2</sup>), while children in the *Short sleep* group was associated with a 0.18 SD increase in BMI (approximately 0.6 kg/m<sup>2</sup>). Our study moves beyond the traditional approach of examining individual self-report sleep characteristics and provides a more holistic view of population sleep. Further research is however needed to determine the relative importance of each sleep characteristics and to determine how sleep as a component of the 24-h day affects cardiometabolic health.



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## Figures

**Figure 1:** Flow diagram of participants included for analysis

**Figure 2:** Visual representation of standardised  $\beta$  coefficients for GEE analysis, adjusted for sex, age (for parents), pubertal stage (for children), socioeconomic position, season of data collection.

**Table 1:** Comparison of CheckPoint children and adults included and excluded for analyses

Children			
	Included	Excluded	P-value
Age (years)			
n	1043	831	
Mean (SD)	12.0 (0.4)	12.1 (0.4)	0.000
Sex			
n	1043	831	
% (males)	50%	53%	0.244
Pubertal stage			
n	963	757	
Mean (SD)	2.1(0.6)	2.2(0.620)	0.040
SEP			
n	1038	829	
Mean (SD)	0.23 (1.02)	0.11 (0.96)	0.009
BMI z-score			
n	1043	828	
Mean (SD)	0.39 (1.14)	0.60 (1.15)	0.000
Adults			
Age (years)			
n	1337	537	
Mean (SD)	44.0 (5.1)	43.2 (5.6)	0.003
Sex			
n	1337	537	
% (males)	13%	12%	0.205
SEP			
n	1331	533	
Mean (SD)	0.21 (0.99)	0.09 (0.98)	0.015
BMI (kg/m <sup>2</sup> )			
n	1330	527	
Mean (SD)	27.4 (5.9)	28.9 (6.5)	0.000

SEP=Socioeconomic position; BMI=body mass index



**Table 2:** Sample characteristics

	<b>Children</b>	<b>Parents</b>
<b>Characteristics</b>		
Values are %, unless indicated		
<i>Demographic</i>		
Age in years, mean (SD)	12.0 (0.4)	44.0 (5.1)
Sex (% males)	50	13
SEP, mean (SD)	0.23 (1.02)	0.21 (0.99)
Not born in Australia	0.8	19.7
Speak a language other than English at home	7.6	9.3
Parent is of Indigenous background	0.8	0.8
<i>Season of data collection (%)</i>		
Summer	24.1	25.0
Autumn	20.9	19.7
Winter	27.2	27.3
Spring	27.8	28.0
<i>Remoteness of area of residence</i>		
Highly accessible	54.6	42.6
Accessible	27.0	21.1
Moderate	15.0	11.7
Remote	1.7	1.3
Very remote	0.7	0.5
Not determined	0.7	0.5

SEP=Socioeconomic position; BMI=body mass index. Remoteness of area of residence was derived using the Accessibility/Remoteness Index of Australia (ARIA) remoteness area code<sup>49</sup>

**Table 3:** Sleep characteristics of clusters

	<b>All</b>		<b>Cluster 1</b>		<b>Cluster 2</b>		<b>Cluster 3</b>		<b>Cluster 4</b>	
			<i>Short sleepers</i>		<i>Late to bed</i>		<i>Long sleepers</i>		<i>Overall good sleepers</i>	
<b>Children</b>										
n	1043		284 (27%)		182 (17%)		254 (24%)		323 (31%)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Efficiency (%)	86.0	4.7	88.9	3.3	85.0	4.2	81.4	4.1	87.6	3.2
Time in bed (min)	544	43	505	33	541	38	577	37	552	29
Midsleep (24-hr:min)	2:35	48	2:30	34	3:46	38	2:15	33	2:16	36
Variability (%)	10.4	5.3	12.6	4.5	13.8	5.6	11.2	4.8	5.8	1.8
Bedtime (24-hr:min)	21:59	52	22:18	41	22:54	46	21:26	35	21:40	38
Rise time (24-hr:min)	7:24	50	7:37	36	8:33	44	7:17	39	7:10	37
<b>Adults</b>										
n	1337		347 (26%)		269 (20%)		297 (22%)		424 (32%)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Efficiency (%)	85.8	6.8	87.7	4.8	86.6	5.3	78.1	6.7	89.1	4.6
Time in bed (min)	497	54	464	42	473	47	544	47	508	42
Midsleep (24-hr:min)	2:51	52	2:12	45	3:46	38	2:58	46	2:45	36
Variability (%)	9.6	5.9	11.2	5.1	15.0	6.4	9.4	5.0	5.0	2.2
Bedtime (24-hr:min)	22:41	60	22:24	58	23:41	61	22:25	49	22:33	44
Rise time (24-hr:min)	7:02	58	6:09	44	7:43	45	7:31	55	6:59	39

**Table 4:** Adjusted GEE analysis to determine the association between cluster membership and standardised cardiometabolic health in children and adults

<i>Children</i>												
Cluster	MetSS (P-value: 0.003)		BMI (P-value: 0.135)		SBP (P-value: 0.766)		DBP (P-value: 0.526)		ApoB/A1 (P-value: 0.065)		GlycA (P-value: 0.414)	
	$\beta$ (95% CI)	P-value	$\beta$ (95% CI)	P-value	$\beta$ (95% CI)	P-value	$\beta$ (95% CI)	P-value	$\beta$ (95% CI)	P-value	$\beta$ (95% CI)	P-value
Short sleepers	0.32(0.12,0.51)	<b>0.001</b>	0.18(0.01,0.34)	0.035	0.07(-0.08,0.22)	0.360	0.05(-0.13,0.22)	0.606	0.26(0.06,0.46)	0.011	0.15(-0.06,0.36)	0.163
Late to bed	-0.05(-0.29,0.20)	0.715	0.01(-0.18,0.20)	0.937	-0.01(-0.20,0.18)	0.923	-0.01(-0.22,0.20)	0.915	0.07(-0.17,0.30)	0.569	0.12(-0.12,0.35)	0.331
Long sleepers	0.09(-0.11,0.28)	0.388	0.11(-0.04,0.26)	0.161	0.01(-0.16,0.17)	0.953	-0.09(-0.26,0.08)	0.314	0.09(-0.11,0.29)	0.366	0.14(-0.05,0.34)	0.149
<i>Adults</i>												
Cluster	MetSS (P-value: 0.009)		BMI (P-value: 0.001)		SBP (P-value: 0.062)		DBP (P-value: 0.629)		ApoB/A1 (P-value: 0.038)		GlycA (P-value: 0.055)	
	$\beta$ (95% CI)	P-value	$\beta$ (95% CI)	P-value	$\beta$ (95% CI)	P-value	$\beta$ (95% CI)	P-value	$\beta$ (95% CI)	P-value	$\beta$ (95% CI)	P-value
Short sleepers	0.02(-0.13,0.17)	0.814	0.12(-0.01,0.26)	0.072	0.10(-0.03,0.24)	0.133	0.07(-0.06,0.20)	0.284	-0.10(-0.25,0.05)	0.189	-0.08(-0.24,0.08)	0.346
Late to bed	0.28(0.10,0.47)	<b>0.003</b>	0.29(0.15,0.44)	<b>&lt;0.001</b>	0.13(-0.04,0.29)	0.131	0.05(-0.11,0.21)	0.554	0.13(-0.02,0.29)	0.099	0.08(-0.07,0.23)	0.274
Long sleepers	0.12(-0.04,0.28)	0.130	0.13(0.00,0.26)	0.051	-0.06(-0.21,0.08)	0.384	-0.02(-0.17,0.12)	0.749	0.09(-0.07,0.24)	0.262	0.15(-0.02,0.32)	0.091

Reference group: *Overall good sleepers*; Overall significance indicated P-value beside headings.

95% CI= 95% confidence interval; MetSS= Metabolic syndrome severity score; BMI= body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; ApoB/A1: Apolipoprotein B/A1; GlycA: glycoprotein acetyls

Bolded text: P-values that remained significant following Holm Sequential Bonferroni adjustment have been bolded.

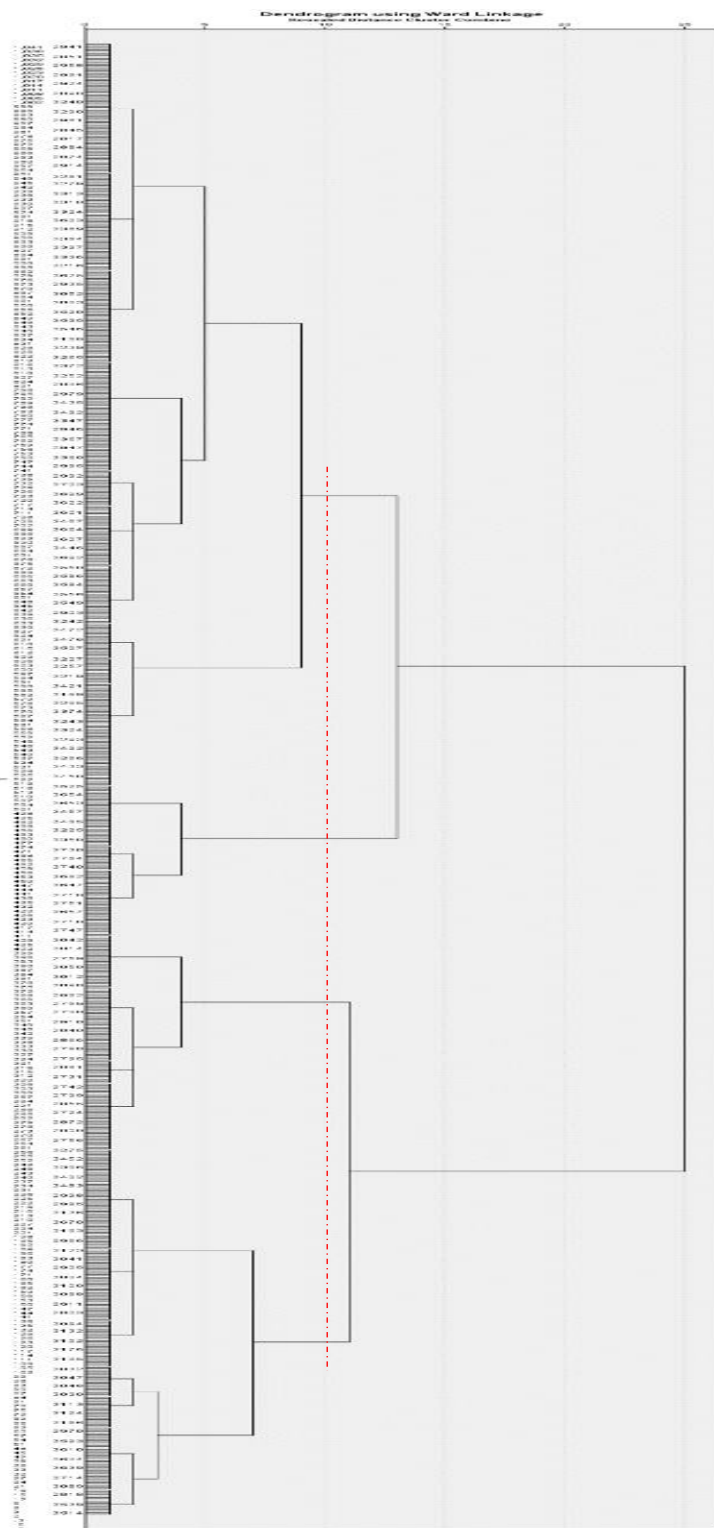
**Table 5:** Adjusted estimated marginal means for each cardiometabolic health outcome measure, according to sleep cluster

<i>Children</i>						
	MetSS	BMI (kg/m <sup>2</sup> )	SBP (mmHg)	DBP (mmHg)	ApoB/A1 (g/L)	GlycA (mmol/L)
Sleep cluster	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)
Short sleep	0.71(0.28,1.15)	19.2(18.8,19.6)	108.3(107.3,109.2)	62.7(62.0,63.5)	0.48(0.46,0.49)	0.99(0.96,1.01)
Late to bed	-0.32(-0.85,0.21)	18.9(18.4,19.4)	107.6(106.5,108.8)	62.4(61.5,63.4)	0.46(0.44,0.48)	0.98(0.96,1.00)
Long sleep	0.06(-0.35,0.46)	18.9(18.5,19.3)	107.8(106.8,108.7)	62.0(61.2,62.7)	0.46(0.45,0.48)	0.98(0.97,1.00)
Good sleep	-0.19(-0.57,0.19)	18.6(18.3,18.9)	107.7(106.3,108.6)	62.5(61.8,63.2)	0.45(0.44,0.47)	0.97(0.95,0.98)
<i>Adults</i>						
	MetSS	BMI (kg/m <sup>2</sup> )	SBP (mmHg)	DBP (mmHg)	ApoB/A1 (g/L)	GlycA (mmol/L)
Sleep cluster	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)
Short sleep	1.02(0.60,1.44)	27.9(27.3,28.6)	122.7(121.5,124.0)	74.7(73.8,75.7)	0.55(0.53,0.57)	1.05(1.02,1.07)
Late to bed	1.89(1.35,2.43)	28.9(28.2,29.7)	123.1(121.3,124.8)	74.5(73.4,75.7)	0.59(0.56,0.61)	1.07(1.05,1.10)
Long sleep	1.36(0.89,1.83)	28.0(27.3,28.6)	120.6(119.1,122.2)	73.9(72.8,75.0)	0.58(0.56,0.60)	1.09(1.06,1.12)
Good sleep	0.96(0.56,1.36)	27.2(26.5,27.8)	121.5(120.0,122.9)	74.1(73.2,75.0)	0.57(0.55,0.59)	1.06(1.04,1.09)

95% CI= 95% confidence interval; MetSS= Metabolic syndrome severity score; BMI= body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; ApoB/A1: Apolipoprotein B/A1; GlycA: glycoprotein acetyls



# Children's Dendrogram



**Agglomeration Schedule**

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	2932	2933	.004	0	0	528
2	3625	3627	.008	0	0	298
3	2959	3549	.014	0	0	362
4	3384	3396	.019	0	0	167
5	3723	3726	.025	0	0	878
6	3349	3373	.032	0	0	41
7	3234	3247	.039	0	0	25
8	3069	3070	.046	0	0	520
9	3236	3248	.054	0	0	480
10	3048	3050	.063	0	0	518
11	3369	3371	.073	0	0	84
12	2943	2944	.083	0	0	99
13	3615	3623	.094	0	0	83
14	2839	2864	.105	0	0	524
15	2851	2873	.116	0	0	410
16	3414	3430	.126	0	0	311
17	2995	2997	.139	0	0	536
18	2808	2819	.151	0	0	401
19	3533	3535	.163	0	0	484
20	3540	3550	.176	0	0	161
21	3287	3291	.189	0	0	52
22	2862	2881	.203	0	0	365
23	2927	2936	.217	0	0	250
24	3628	3643	.231	0	0	133
25	2908	3234	.245	0	7	371
26	3638	3640	.260	0	0	69
27	3333	3360	.276	0	0	489
28	2947	2964	.292	0	0	569
29	3534	3546	.309	0	0	151
30	3399	3421	.325	0	0	233
31	3305	3337	.341	0	0	82
32	3268	3286	.358	0	0	214
33	3145	3636	.376	0	0	177
34	3564	3579	.394	0	0	787
35	3446	3649	.412	0	0	475
36	2759	2762	.430	0	0	432
37	3370	3385	.449	0	0	111
38	3084	3101	.468	0	0	425
39	2934	2937	.487	0	0	353
40	2883	2898	.508	0	0	421
41	3324	3349	.529	0	6	393
42	3308	3311	.550	0	0	226
43	2968	2975	.571	0	0	515
44	3055	3061	.593	0	0	707
45	2871	2872	.616	0	0	124
46	2853	2858	.638	0	0	198
47	3568	3589	.662	0	0	186
48	3104	3110	.685	0	0	131
49	3320	3344	.708	0	0	367
50	2972	3567	.732	0	0	122
51	2930	3544	.756	0	0	146
52	3287	3318	.781	21	0	209
53	2863	2876	.805	0	0	170
54	3272	3285	.830	0	0	478
55	3180	3183	.855	0	0	800
56	3529	3553	.880	0	0	511
57	2829	2834	.907	0	0	532
58	2843	2867	.933	0	0	523
59	3315	3322	.961	0	0	440

60	3677	3688	.989	0	0	485
61	3379	3403	1.017	0	0	384
62	2952	2958	1.045	0	0	299
63	3293	3312	1.074	0	0	271
64	3335	3336	1.103	0	0	389
65	2919	2925	1.133	0	0	362
66	3126	3132	1.163	0	0	592
67	3299	3310	1.193	0	0	150
68	3610	3616	1.224	0	0	452
69	3638	3650	1.255	26	0	241
70	3601	3630	1.285	0	0	217
71	3346	3363	1.316	0	0	260
72	3118	3136	1.347	0	0	123
73	3424	3449	1.379	0	0	517
74	3684	3700	1.410	0	0	275
75	2816	2833	1.443	0	0	334
76	2888	3211	1.476	0	0	416
77	3611	3639	1.509	0	0	460
78	3345	3375	1.542	0	0	554
79	2879	2899	1.575	0	0	327
80	3572	3592	1.609	0	0	246
81	3350	3364	1.642	0	0	437
82	3305	3314	1.676	31	0	656
83	3606	3615	1.710	0	13	508
84	3356	3369	1.745	0	11	546
85	3437	3461	1.780	0	0	218
86	2960	2965	1.815	0	0	425
87	3215	3239	1.850	0	0	466
88	2904	2910	1.886	0	0	580
89	3200	3216	1.923	0	0	556
90	3152	3156	1.959	0	0	769
91	3591	3598	1.995	0	0	435
92	2924	2956	2.032	0	0	322
93	3265	3283	2.069	0	0	593
94	3556	3561	2.107	0	0	386
95	3400	3427	2.144	0	0	467
96	2978	2990	2.182	0	0	569
97	3275	3301	2.220	0	0	269
98	2870	2887	2.258	0	0	228
99	2943	2951	2.296	12	0	684
100	2877	2889	2.335	0	0	176
101	3230	3251	2.373	0	0	134
102	2921	2931	2.412	0	0	353
103	3645	3671	2.452	0	0	241
104	3033	3034	2.491	0	0	518
105	3701	3706	2.531	0	0	370
106	3689	3696	2.571	0	0	490
107	3019	3025	2.612	0	0	722
108	3279	3317	2.652	0	0	400
109	3140	3154	2.693	0	0	181
110	3463	3464	2.734	0	0	424
111	3370	3409	2.775	37	0	598
112	2974	2981	2.817	0	0	227
113	3487	3491	2.859	0	0	344
114	3660	3665	2.902	0	0	719
115	3217	3232	2.944	0	0	667
116	3552	3565	2.988	0	0	445
117	2807	2822	3.033	0	0	625
118	2987	2993	3.077	0	0	405
119	2941	2955	3.122	0	0	182
120	3077	3091	3.167	0	0	503
121	3607	3631	3.212	0	0	274
122	2972	3576	3.258	50	0	375



123	3118	3125	3.306	72	0	619
124	2871	2892	3.353	45	0	464
125	3281	3321	3.400	0	0	564
126	3392	3440	3.448	0	0	665
127	3288	3331	3.496	0	0	420
128	2950	3292	3.544	0	0	422
129	3253	3266	3.593	0	0	318
130	3517	3531	3.641	0	0	562
131	3100	3104	3.690	0	48	430
132	2773	2775	3.739	0	0	695
133	3622	3628	3.789	0	24	345
134	3229	3230	3.839	0	101	556
135	2976	2985	3.889	0	0	405
136	3240	3280	3.939	0	0	566
137	3383	3397	3.989	0	0	453
138	3391	3393	4.039	0	0	463
139	2824	2837	4.089	0	0	276
140	2973	2977	4.140	0	0	515
141	3282	3348	4.191	0	0	437
142	3167	3676	4.242	0	0	522
143	3647	3659	4.294	0	0	628
144	3407	3442	4.346	0	0	294
145	3429	3436	4.398	0	0	680
146	2930	3080	4.451	51	0	395
147	2966	2983	4.503	0	0	372
148	3289	3339	4.556	0	0	304
149	3343	3398	4.609	0	0	639
150	3299	3541	4.662	67	0	656
151	3524	3534	4.715	0	29	688
152	3072	3085	4.768	0	0	642
153	2998	3001	4.822	0	0	357
154	3750	3751	4.877	0	0	613
155	3707	3731	4.931	0	0	481
156	3456	3690	4.986	0	0	475
157	3435	3444	5.040	0	0	413
158	3570	3585	5.095	0	0	547
159	2986	3138	5.150	0	0	495
160	3695	3704	5.206	0	0	628
161	3540	3557	5.261	20	0	551
162	3441	3454	5.317	0	0	536
163	3243	3274	5.372	0	0	667
164	3614	3624	5.428	0	0	632
165	3699	3712	5.484	0	0	380
166	3122	3133	5.539	0	0	611
167	3382	3384	5.596	0	4	747
168	2817	2831	5.653	0	0	649
169	3103	3111	5.710	0	0	482
170	2836	2863	5.767	0	53	565
171	2954	3319	5.824	0	0	440
172	3419	3433	5.881	0	0	474
173	3278	3342	5.938	0	0	389
174	3052	3064	5.996	0	0	351
175	3358	3361	6.053	0	0	576
176	2866	2877	6.111	0	100	414
177	3145	3646	6.169	33	0	452
178	3425	3633	6.227	0	0	356
179	2737	2738	6.285	0	0	432
180	3663	3678	6.344	0	0	488
181	3134	3140	6.403	0	109	368
182	2922	2941	6.462	0	119	528
183	3423	3460	6.521	0	0	320
184	2996	3144	6.580	0	0	674
185	2869	3041	6.640	0	0	436

186	3568	3582	6.700	47	0	765
187	2735	2740	6.760	0	0	797
188	3295	3313	6.820	0	0	444
189	3635	3668	6.881	0	0	335
190	2749	2751	6.941	0	0	586
191	3206	3244	7.002	0	0	319
192	3637	3667	7.063	0	0	606
193	3372	3408	7.125	0	0	384
194	2765	2774	7.187	0	0	555
195	3012	3017	7.249	0	0	660
196	2800	2826	7.312	0	0	471
197	3323	3367	7.375	0	0	545
198	2853	2874	7.437	46	0	358
199	3657	3685	7.500	0	0	443
200	2918	3249	7.563	0	0	465
201	3563	3583	7.626	0	0	254
202	2878	2900	7.690	0	0	464
203	3224	3226	7.754	0	0	461
204	3472	3477	7.818	0	0	697
205	3250	3543	7.882	0	0	407
206	3148	3153	7.947	0	0	324
207	3316	3325	8.012	0	0	663
208	2969	2982	8.077	0	0	489
209	2961	3287	8.143	0	52	422
210	3114	3117	8.208	0	0	438
211	3071	3076	8.275	0	0	509
212	2989	2992	8.341	0	0	499
213	3515	3520	8.408	0	0	668
214	2946	3268	8.474	0	32	360
215	2909	2948	8.541	0	0	561
216	2999	3451	8.607	0	0	301
217	3599	3601	8.674	0	70	547
218	3420	3437	8.741	0	85	359
219	3469	3484	8.809	0	0	597
220	2743	2760	8.877	0	0	591
221	3415	3426	8.946	0	0	587
222	2923	2953	9.015	0	0	717
223	3457	3462	9.084	0	0	262
224	3542	3548	9.153	0	0	562
225	3422	3432	9.223	0	0	450
226	3308	3355	9.293	42	0	546
227	2974	3395	9.362	112	0	664
228	2870	2902	9.432	98	0	410
229	3269	3300	9.503	0	0	545
230	2854	2859	9.573	0	0	617
231	3587	3600	9.644	0	0	512
232	3471	3480	9.715	0	0	602
233	3399	3405	9.787	30	0	456
234	3386	3410	9.859	0	0	399
235	3334	3381	9.931	0	0	609
236	3015	3016	10.004	0	0	825
237	3102	3129	10.076	0	0	505
238	2915	3065	10.149	0	0	468
239	2780	2797	10.222	0	0	454
240	2897	2911	10.295	0	0	365
241	3638	3645	10.369	69	103	590
242	2845	2850	10.443	0	0	401
243	3273	3290	10.518	0	0	304
244	3270	3303	10.593	0	0	415
245	2825	2835	10.669	0	0	383
246	3572	3573	10.744	80	0	709
247	3455	3466	10.819	0	0	377
248	3718	3734	10.895	0	0	570

249	3164	3168	10.971	0	0	492
250	2927	2928	11.047	23	0	513
251	3119	3120	11.123	0	0	408
252	3259	3304	11.200	0	0	781
253	3233	3260	11.276	0	0	566
254	3563	3603	11.353	201	0	610
255	2785	2809	11.431	0	0	672
256	3664	3672	11.508	0	0	590
257	3670	3693	11.586	0	0	577
258	3431	3438	11.664	0	0	576
259	3593	3608	11.743	0	0	435
260	3346	3380	11.822	71	0	400
261	3711	3713	11.902	0	0	316
262	3457	3473	11.983	223	0	677
263	3479	3702	12.064	0	0	392
264	3256	3302	12.146	0	0	317
265	3428	3467	12.227	0	0	463
266	2757	2784	12.310	0	0	578
267	3673	3692	12.392	0	0	572
268	3525	3537	12.475	0	0	615
269	3275	3353	12.558	97	0	418
270	3208	3221	12.641	0	0	770
271	3293	3306	12.725	63	0	758
272	2963	3347	12.809	0	0	369
273	3040	3043	12.893	0	0	705
274	3607	3612	12.977	121	0	666
275	3656	3684	13.061	0	74	606
276	2824	2884	13.146	139	0	736
277	3297	3351	13.230	0	0	694
278	3198	3218	13.315	0	0	640
279	3051	3074	13.400	0	0	631
280	2754	2772	13.485	0	0	366
281	3722	3728	13.571	0	0	594
282	3081	3088	13.657	0	0	506
283	3641	3679	13.743	0	0	683
284	2957	3115	13.830	0	0	553
285	2788	2804	13.917	0	0	676
286	2939	2945	14.005	0	0	734
287	3010	3020	14.093	0	0	657
288	3742	3749	14.182	0	0	530
289	3413	3450	14.270	0	0	526
290	3172	3178	14.359	0	0	469
291	3476	3481	14.448	0	0	599
292	2790	2846	14.537	0	0	406
293	3222	3235	14.627	0	0	328
294	3407	3609	14.717	144	0	539
295	2886	2894	14.808	0	0	465
296	3214	3258	14.899	0	0	646
297	3307	3328	14.990	0	0	453
298	3617	3625	15.081	0	2	709
299	2952	2980	15.172	62	0	568
300	3588	3618	15.264	0	0	429
301	2991	2999	15.356	0	216	644
302	2852	2896	15.449	0	0	653
303	3494	3496	15.541	0	0	472
304	3273	3289	15.634	243	148	658
305	2761	2764	15.728	0	0	486
306	3083	3112	15.823	0	0	531
307	3497	3501	15.918	0	0	622
308	3176	3182	16.013	0	0	502
309	2890	3212	16.109	0	0	593
310	3554	3575	16.206	0	0	559
311	3387	3414	16.302	0	16	661

312	2767	2778	16.400	0	0	616
313	3516	3519	16.499	0	0	402
314	2795	2810	16.599	0	0	524
315	3022	3032	16.699	0	0	777
316	3687	3711	16.800	0	261	637
317	3256	3276	16.900	264	0	654
318	3241	3253	17.001	0	129	573
319	3206	3207	17.102	191	0	428
320	3423	3443	17.202	183	0	597
321	3037	3054	17.304	0	0	581
322	2924	2949	17.407	92	0	571
323	3209	3231	17.510	0	0	640
324	3127	3148	17.613	0	206	619
325	3261	3262	17.716	0	0	480
326	3046	3223	17.819	0	0	706
327	2879	2914	17.923	79	0	416
328	3204	3222	18.027	0	293	768
329	2842	3196	18.132	0	0	789
330	3089	3577	18.238	0	0	690
331	2820	2838	18.343	0	0	412
332	3362	3365	18.449	0	0	474
333	3056	3073	18.557	0	0	520
334	2816	2841	18.665	75	0	774
335	3003	3635	18.773	0	189	577
336	3682	3683	18.882	0	0	686
337	3296	3341	18.991	0	0	448
338	3157	3173	19.100	0	0	724
339	3470	3495	19.210	0	0	550
340	2812	2818	19.320	0	0	621
341	3736	3738	19.431	0	0	805
342	3596	3620	19.541	0	0	652
343	3116	3123	19.652	0	0	679
344	3474	3487	19.763	0	113	550
345	3622	3658	19.875	133	0	854
346	3745	3746	19.987	0	0	784
347	3558	3581	20.100	0	0	661
348	3389	3655	20.214	0	0	508
349	3493	3681	20.327	0	0	602
350	3332	3368	20.441	0	0	598
351	3052	3068	20.555	174	0	655
352	3150	3597	20.669	0	0	624
353	2921	2934	20.783	102	39	731
354	3284	3294	20.898	0	0	685
355	3210	3246	21.014	0	0	732
356	3425	3621	21.131	178	0	600
357	2998	3000	21.248	153	0	603
358	2853	2885	21.365	198	0	689
359	3420	3453	21.483	218	0	782
360	2946	3264	21.601	214	0	793
361	3194	3202	21.720	0	0	748
362	2919	2959	21.839	65	3	730
363	2832	2848	21.958	0	0	588
364	3518	3539	22.077	0	0	552
365	2862	2897	22.197	22	240	653
366	2754	2796	22.317	280	0	555
367	3320	3402	22.438	49	0	554
368	3134	3142	22.559	181	0	755
369	2963	2988	22.681	272	0	607
370	3701	3710	22.802	105	0	490
371	2908	3228	22.924	25	0	647
372	2966	2967	23.047	147	0	752
373	2798	2802	23.172	0	0	496
374	3468	3475	23.299	0	0	618

375	2972	3096	23.426	122	0	553
376	2763	2793	23.553	0	0	774
377	3455	3465	23.680	247	0	743
378	2912	2940	23.808	0	0	519
379	2880	2901	23.936	0	0	631
380	3698	3699	24.064	0	165	541
381	2756	2768	24.193	0	0	486
382	3009	3023	24.322	0	0	459
383	2794	2825	24.451	0	245	636
384	3372	3379	24.580	193	61	626
385	3492	3504	24.710	0	0	744
386	3551	3556	24.840	0	94	691
387	2907	2926	24.971	0	0	617
388	3027	3029	25.102	0	0	657
389	3278	3335	25.232	173	64	654
390	3146	3162	25.364	0	0	498
391	3729	3732	25.495	0	0	530
392	3479	3708	25.627	263	0	725
393	3324	3590	25.759	41	0	539
394	2745	2747	25.892	0	0	616
395	2930	2935	26.024	146	0	726
396	2789	2814	26.158	0	0	589
397	3571	3605	26.292	0	0	737
398	2783	3011	26.426	0	0	741
399	3386	3459	26.561	234	0	708
400	3279	3346	26.696	108	260	500
401	2808	2845	26.832	18	242	728
402	3516	3538	26.968	313	0	795
403	3197	3201	27.105	0	0	651
404	3488	3499	27.243	0	0	567
405	2976	2987	27.381	135	118	521
406	2790	2847	27.521	292	0	487
407	3250	3530	27.663	205	0	511
408	3087	3119	27.806	0	251	873
409	2787	2830	27.950	0	0	630
410	2851	2870	28.094	15	228	731
411	3602	3632	28.239	0	0	477
412	2820	2823	28.384	331	0	838
413	3435	3458	28.530	157	0	517
414	2865	2866	28.676	0	176	746
415	3257	3270	28.823	0	244	620
416	2879	2888	28.970	327	76	689
417	2758	2779	29.117	0	0	822
418	3275	3352	29.264	269	0	735
419	2776	2799	29.411	0	0	586
420	3271	3288	29.560	0	127	573
421	2827	2883	29.710	0	40	625
422	2950	2961	29.861	128	209	658
423	3604	3629	30.012	0	0	605
424	3463	3485	30.163	110	0	618
425	2960	3084	30.315	86	38	727
426	3031	3035	30.468	0	0	660
427	3252	3326	30.622	0	0	794
428	3205	3206	30.777	0	319	736
429	3588	3594	30.932	300	0	702
430	3075	3100	31.087	0	131	629
431	3026	3028	31.243	0	0	741
432	2737	2759	31.399	179	36	687
433	3190	3195	31.555	0	0	739
434	3521	3523	31.712	0	0	691
435	3591	3593	31.869	91	259	611
436	2869	3038	32.027	185	0	807
437	3282	3350	32.184	141	81	749

438	3114	3135	32.343	210	0	531
439	3161	3165	32.502	0	0	585
440	2954	3315	32.662	171	59	457
441	3092	3108	32.822	0	0	816
442	3193	3219	32.982	0	0	768
443	3648	3657	33.143	0	199	745
444	3109	3295	33.304	0	188	720
445	3522	3552	33.467	0	116	551
446	3562	3595	33.630	0	0	615
447	3340	3359	33.794	0	0	607
448	3277	3296	33.959	0	337	718
449	3483	3486	34.123	0	0	819
450	3422	3447	34.288	225	0	778
451	3720	3733	34.453	0	0	670
452	3145	3610	34.618	177	68	791
453	3307	3383	34.784	297	137	665
454	2770	2780	34.950	0	239	713
455	2748	2777	35.117	0	0	627
456	3378	3399	35.284	0	233	544
457	2954	3388	35.451	440	0	849
458	2913	2920	35.619	0	0	746
459	3009	3021	35.789	382	0	853
460	3578	3611	35.961	0	77	605
461	3213	3224	36.134	0	203	634
462	2766	2801	36.306	0	0	841
463	3391	3428	36.479	138	265	799
464	2871	2878	36.652	124	202	753
465	2886	2918	36.826	295	200	734
466	3203	3215	37.000	0	87	651
467	3400	3651	37.179	95	0	666
468	2915	3062	37.359	238	0	707
469	3172	3177	37.539	290	0	785
470	2938	2962	37.720	0	0	714
471	2800	2813	37.902	196	0	523
472	3490	3494	38.084	0	303	744
473	3159	3170	38.266	0	0	827
474	3362	3419	38.449	332	172	723
475	3446	3456	38.632	35	156	742
476	2984	2994	38.815	0	0	752
477	3580	3602	38.998	0	411	760
478	3272	3298	39.182	54	0	732
479	3329	3338	39.367	0	0	620
480	3236	3261	39.553	9	325	848
481	3707	3716	39.739	155	0	803
482	3103	3128	39.926	169	0	629
483	3189	3191	40.114	0	0	733
484	3533	3555	40.302	19	0	702
485	3653	3677	40.490	0	60	700
486	2756	2761	40.678	381	305	695
487	2790	2849	40.868	406	0	756
488	3644	3663	41.059	0	180	686
489	2969	3333	41.250	208	27	639
490	3689	3701	41.443	106	370	745
491	3163	3181	41.638	0	0	725
492	3160	3164	41.833	0	249	751
493	3227	3309	42.028	0	0	595
494	3366	3412	42.224	0	0	623
495	2986	3155	42.420	159	0	766
496	2798	2815	42.617	373	0	672
497	3661	3669	42.814	0	0	767
498	3146	3166	43.012	390	0	724
499	2989	3004	43.213	212	0	855
500	3279	3401	43.414	400	0	718

501	3044	3053	43.616	0	0	824
502	3176	3680	43.818	308	0	751
503	3057	3077	44.022	0	120	584
504	3093	3124	44.228	0	0	699
505	3102	3106	44.434	237	0	755
506	2929	3081	44.641	0	282	813
507	2725	2729	44.848	0	0	692
508	3389	3606	45.056	348	83	747
509	2891	3071	45.266	0	211	655
510	2868	2895	45.476	0	0	612
511	3250	3529	45.687	407	56	788
512	3584	3587	45.899	0	231	610
513	2927	2971	46.112	250	0	568
514	3662	3719	46.325	0	0	742
515	2968	2973	46.539	43	140	664
516	3394	3416	46.753	0	0	641
517	3424	3435	46.969	73	413	743
518	3033	3048	47.186	104	10	867
519	2857	2912	47.408	0	378	580
520	3056	3069	47.631	333	8	705
521	2976	3130	47.855	405	0	603
522	3141	3167	48.079	0	142	683
523	2800	2843	48.303	471	58	753
524	2795	2839	48.530	314	14	676
525	3686	3703	48.758	0	0	719
526	3376	3413	48.986	0	289	776
527	2746	2805	49.214	0	0	669
528	2922	2932	49.443	182	1	786
529	2753	2781	49.671	0	0	649
530	3729	3742	49.902	391	288	904
531	3083	3114	50.134	306	438	678
532	2806	2829	50.366	0	57	739
533	3714	3721	50.598	0	0	798
534	2828	2917	50.831	0	0	790
535	2803	3024	51.064	0	0	775
536	2995	3441	51.298	17	162	644
537	3559	3619	51.533	0	0	779
538	3527	3586	51.770	0	0	738
539	3324	3407	52.006	393	294	840
540	3058	3066	52.245	0	0	701
541	3666	3698	52.485	0	380	670
542	3082	3086	52.725	0	0	699
543	2875	2906	52.965	0	0	717
544	3327	3378	53.208	0	456	879
545	3269	3323	53.450	229	197	564
546	3308	3356	53.694	226	84	609
547	3570	3599	53.938	158	217	652
548	3039	3047	54.184	0	0	853
549	3730	3748	54.429	0	0	842
550	3470	3474	54.680	339	344	697
551	3522	3540	54.934	445	161	883
552	3518	3545	55.188	364	0	642
553	2957	2972	55.450	284	375	726
554	3320	3345	55.712	367	78	708
555	2754	2765	55.975	366	194	821
556	3200	3229	56.238	89	134	789
557	2742	2771	56.502	0	0	712
558	3147	3149	56.766	0	0	592
559	3554	3574	57.032	310	0	688
560	3755	3760	57.299	0	0	842
561	2909	2942	57.569	215	0	714
562	3517	3542	57.838	130	224	730
563	3237	3263	58.110	0	0	818

564	3269	3281	58.382	545	125	663
565	2821	2836	58.655	0	170	728
566	3233	3240	58.931	253	136	647
567	3482	3488	59.209	0	404	802
568	2927	2952	59.488	513	299	852
569	2947	2978	59.767	28	96	684
570	3718	3743	60.047	248	0	803
571	2893	2924	60.328	0	322	833
572	3673	3705	60.610	267	0	796
573	3241	3271	60.893	318	420	770
574	3709	3727	61.176	0	0	805
575	3761	3763	61.460	0	0	966
576	3358	3431	61.746	175	258	632
577	3003	3670	62.035	335	257	624
578	2741	2757	62.325	0	266	713
579	3018	3042	62.614	0	0	722
580	2857	2904	62.906	519	88	808
581	3037	3059	63.197	321	0	703
582	3694	3740	63.490	0	0	911
583	3139	3158	63.783	0	0	873
584	3057	3067	64.077	503	0	706
585	3143	3161	64.373	0	439	764
586	2749	2776	64.670	190	419	884
587	3415	3434	64.968	221	0	716
588	2832	2840	65.266	363	0	808
589	2789	2855	65.567	396	0	759
590	3638	3664	65.870	241	256	799
591	2743	2752	66.174	220	0	817
592	3126	3147	66.478	66	558	845
593	2890	3265	66.785	309	93	788
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598	3332	3370	68.331	350	111	776
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601	2728	2736	69.278	0	0	823
602	3471	3493	69.595	232	349	831
603	2976	2998	69.914	521	357	870
604	3715	3737	70.235	0	0	767
605	3578	3604	70.560	460	423	868
606	3637	3656	70.885	192	275	791
607	2963	3340	71.211	369	447	874
608	2786	2861	71.538	0	0	681
609	3308	3334	71.866	546	235	836
610	3563	3584	72.196	254	512	738
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612	2792	2868	72.859	0	510	830
613	3750	3753	73.191	154	0	784
614	3220	3255	73.524	0	0	804
615	3525	3562	73.857	268	446	740
616	2745	2767	74.190	394	312	897
617	2854	2907	74.524	230	387	675
618	3463	3468	74.862	424	374	677
619	3118	3127	75.201	123	324	766
620	3257	3329	75.540	415	479	826
621	2812	3513	75.881	340	0	822
622	3497	3506	76.225	307	0	828
623	3366	3452	76.571	494	0	735
624	3003	3150	76.919	577	352	913
625	2807	2827	77.268	117	421	833
626	3372	3406	77.617	384	0	869



627	2739	2748	77.969	0	455	711
628	3647	3695	78.322	143	160	839
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630	2787	2856	79.038	409	0	876
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636	2794	2811	81.230	383	0	815
637	3687	3735	81.603	316	0	796
638	3756	3759	81.979	0	0	890
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643	3151	3675	83.876	0	0	827
644	2991	2995	84.258	301	536	809
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646	3214	3357	85.025	296	0	865
647	2908	3233	85.408	371	566	857
648	3063	3078	85.793	0	0	801
649	2753	2817	86.178	529	168	835
650	3113	3613	86.565	0	0	806
651	3197	3203	86.953	403	466	733
652	3570	3596	87.342	547	342	856
653	2852	2862	87.731	302	365	813
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655	2891	3052	88.517	509	351	909
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657	3010	3027	89.307	287	388	867
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664	2968	2974	92.138	515	227	852
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667	3217	3243	93.390	115	163	773
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670	3666	3720	94.651	541	451	862
671	3036	3049	95.074	0	0	872
672	2785	2798	95.498	255	496	871
673	3179	3185	95.923	0	0	785
674	2970	2996	96.354	0	184	783
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676	2788	2795	97.219	285	524	871
677	3457	3463	97.654	262	618	898
678	3083	3137	98.094	531	0	909
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680	3429	3448	98.978	145	0	723
681	2786	2860	99.422	608	0	817
682	3238	3330	99.873	0	0	918
683	3141	3641	100.324	522	283	868
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685	3199	3284	101.256	0	354	879
686	3644	3682	101.731	488	336	757
687	2730	2737	102.206	0	432	942
688	3524	3554	102.683	151	559	765
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718	3277	3279	118.252	448	500	848
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725	3163	3479	122.166	491	392	906
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728	2808	2821	123.879	401	565	815
729	2903	3245	124.453	0	0	863
730	2919	3517	125.038	362	562	859
731	2851	2921	125.625	410	353	786
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737	3122	3571	129.224	611	397	783
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739	2806	3190	130.448	532	433	894
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742	3446	3662	132.304	475	514	877
743	3424	3455	132.930	517	377	905
744	3490	3492	133.568	472	385	831
745	3648	3689	134.206	443	490	904
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747	3382	3389	135.484	167	508	840
748	3194	3198	136.125	361	640	781
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755	3102	3134	140.710	505	368	845
756	2790	2844	141.374	487	635	933
757	3642	3644	142.045	0	686	912
758	3293	3297	142.722	271	694	920
759	2755	2789	143.400	0	589	830
760	3566	3580	144.086	0	477	957
761	3507	3508	144.775	0	0	958
762	3526	3654	145.471	0	0	881
763	3030	3060	146.182	0	0	896
764	3143	3169	146.894	585	0	921
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782	3420	3470	160.976	359	697	928
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785	3172	3179	163.519	469	673	889
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788	2890	3250	166.111	593	511	926
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793	2946	3269	170.545	360	663	874
794	2886	3252	171.453	734	427	935
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796	3673	3687	173.286	572	637	877
797	2724	2735	174.213	0	187	823
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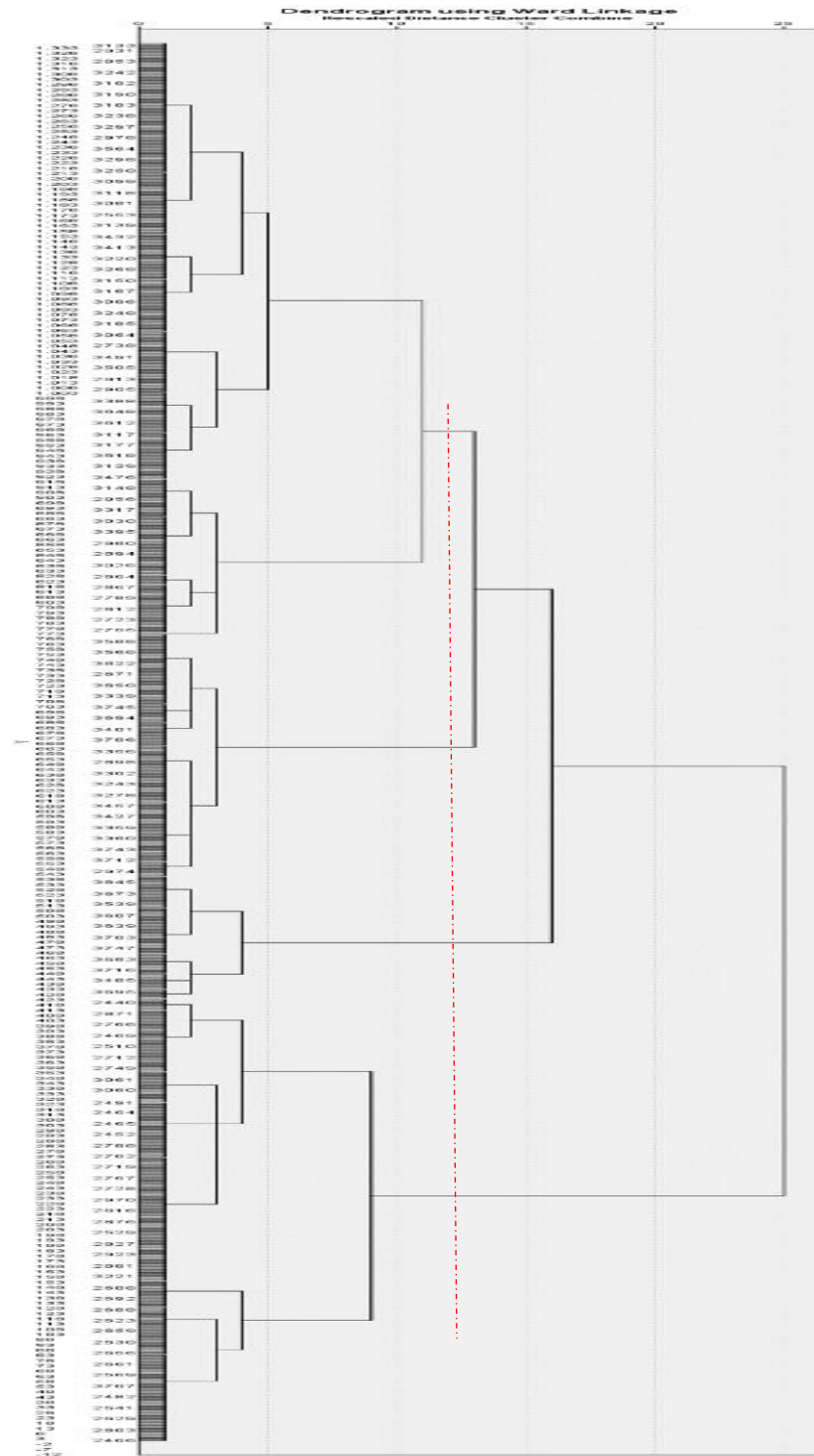
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840	3324	3382	222.071	539	747	927
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842	3730	3755	224.657	549	560	858
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846	2865	2875	229.905	746	717	939
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854	3503	3622	240.692	0	345	862
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857	2908	2950	244.960	647	658	963
858	3730	3754	246.432	842	0	966
859	2919	3521	247.916	730	691	943
860	2842	3256	249.411	789	654	971
861	3660	3661	250.914	719	767	932
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863	2903	3547	253.972	729	0	981
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869	3372	3415	263.421	626	716	976
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871	2785	2788	266.726	672	676	939
872	2869	3036	268.402	866	671	944
873	3087	3139	270.088	408	583	951
874	2946	2963	271.781	793	607	989
875	3210	3237	273.485	732	818	919
876	2787	2828	275.210	630	790	935
877	3446	3673	276.979	742	796	924
878	3722	3723	278.753	698	5	937

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880	2756	2763	282.352	695	774	930
881	3526	3559	284.184	762	779	973
882	3063	3097	286.020	801	0	959
883	3522	3527	287.857	551	738	975
884	2749	2755	289.704	586	830	917
885	3332	3362	291.554	776	723	949
886	3009	3022	293.457	853	777	978
887	2791	3072	295.387	795	642	954
888	2723	3006	297.364	0	0	956
889	3160	3172	299.343	751	785	972
890	3756	3758	301.356	638	0	937
891	2960	3040	303.370	727	705	964
892	3107	3171	305.387	0	0	959
893	2943	2969	307.406	684	809	989
894	2806	2853	309.467	739	689	947
895	2854	2966	311.563	675	752	962
896	3030	3046	313.665	763	706	951
897	2732	2745	315.783	0	616	929
898	3354	3457	317.901	812	677	967
899	3358	3411	320.024	704	600	946
900	3193	3227	322.151	826	595	982
901	2954	3275	324.318	849	735	988
902	2989	3691	326.504	855	715	979
903	2726	3188	328.708	780	0	980
904	3648	3729	330.916	745	530	934
905	3424	3471	333.174	743	831	1000
906	3163	3423	335.464	725	819	988
907	2782	2783	337.832	693	825	956
908	3131	3175	340.250	750	832	997
909	2891	3083	342.676	655	678	940
910	2851	2927	345.128	786	852	970
911	3694	3741	347.652	582	710	936
912	3642	3647	350.240	757	839	957
913	3003	3180	352.829	624	800	960
914	3044	3095	355.428	824	806	965
915	3515	3524	358.063	668	864	1003
916	3141	3145	360.717	868	791	993
917	2742	2749	363.423	841	884	1001
918	3238	3439	366.146	682	0	953
919	3210	3267	368.876	875	645	983
920	3293	3422	371.614	758	778	991
921	3143	3187	374.392	764	0	972
922	3445	3489	377.224	700	771	998
923	2803	2852	380.140	843	813	964
924	3387	3446	383.067	844	877	987
925	3482	3509	386.004	802	850	958
926	2890	3189	388.979	788	733	980
927	3109	3324	391.998	720	840	968
928	3420	3476	395.025	782	828	1002
929	2724	2732	398.089	823	897	994
930	2756	2800	401.216	880	753	994
931	3192	3194	404.452	773	865	999
932	3503	3660	407.699	862	861	979
933	2746	2790	410.964	838	756	995
934	3648	3745	414.295	904	784	992
935	2787	2886	417.643	876	794	976
936	3694	3709	421.032	911	805	985
937	3722	3756	424.438	878	890	992
938	2725	2727	427.906	820	834	977
939	2785	2865	431.404	871	846	961
940	2891	2930	435.004	909	851	1015
941	3099	3146	438.613	769	724	965

942	2730	3010	442.228	687	867	996
943	2909	2919	445.873	814	859	975
944	2869	3090	449.565	872	792	1005
945	3012	3058	453.373	660	829	996
946	3220	3358	457.223	804	899	967
947	2753	2806	461.178	835	894	969
948	3007	3013	465.275	0	811	990
949	3208	3332	469.379	770	885	991
950	2970	3151	473.491	783	827	1004
951	3030	3087	477.609	896	873	978
952	3242	3564	481.733	837	787	981
953	3238	3418	485.911	918	810	982
954	2791	3511	490.099	887	721	984
955	3089	3626	494.409	816	798	993
956	2723	2782	498.724	888	907	990
957	3566	3642	503.317	760	912	1010
958	3482	3507	507.960	925	761	1002
959	3063	3107	512.635	882	892	1019
960	2976	3003	517.628	870	913	1007
961	2785	2832	522.790	939	808	974
962	2854	3005	528.015	895	0	1007
963	2807	2908	533.257	833	857	970
964	2803	2960	539.129	923	891	1005
965	3044	3099	545.106	914	941	997
966	3730	3761	551.096	858	575	1006
967	3220	3354	557.223	946	898	998
968	3109	3236	563.578	927	848	1011
969	2753	2794	570.032	947	815	1008
970	2807	2851	576.488	963	910	1008
971	2842	3282	583.040	860	836	1011
972	3143	3160	589.623	921	889	986
973	3525	3526	596.304	740	881	1013
974	2741	2785	603.369	821	961	995
975	2909	3522	610.505	943	883	1012
976	2787	3372	617.730	935	869	1014
977	2725	2743	625.006	938	817	1020
978	3009	3030	632.425	886	951	1025
979	2989	3503	639.909	902	932	1023
980	2726	2890	647.430	903	926	1003
981	2903	3242	655.053	863	952	1012
982	3193	3238	662.892	900	953	1022
983	3199	3210	670.762	879	919	1017
984	2758	2791	678.702	822	954	1009
985	3694	3762	686.705	936	847	1006
986	3102	3143	694.800	845	972	1019
987	3387	3391	702.921	924	856	1021
988	2954	3163	711.110	901	906	1018
989	2943	2946	719.593	893	874	1000
990	2723	3007	728.109	956	948	1016
991	3208	3293	737.508	949	920	999
992	3648	3722	746.969	934	937	1010
993	3089	3141	757.144	955	916	1004
994	2724	2756	767.383	929	930	1001
995	2741	2746	778.026	974	933	1029
996	2730	3012	788.996	942	945	1016
997	3044	3131	800.338	965	908	1025
998	3220	3445	811.911	967	922	1013
999	3192	3208	823.604	931	991	1017
1000	2943	3424	835.560	989	905	1014
1001	2724	2742	847.964	994	917	1020
1002	3420	3482	860.431	928	958	1028
1003	2726	3515	873.097	980	915	1015
1004	2970	3089	886.030	950	993	1030

1005	2803	2869	900.430	964	944	1026
1006	3694	3730	915.719	985	966	1027
1007	2854	2976	931.077	962	960	1018
1008	2753	2807	947.722	969	970	1032
1009	2722	2758	965.276	0	984	1030
1010	3566	3648	983.233	957	992	1027
1011	2842	3109	1001.665	971	968	1024
1012	2903	2909	1021.798	981	975	1021
1013	3220	3525	1042.554	998	973	1036
1014	2787	2943	1064.386	976	1000	1034
1015	2726	2891	1086.966	1003	940	1024
1016	2723	2730	1113.197	990	996	1035
1017	3192	3199	1139.580	999	983	1022
1018	2854	2954	1166.225	1007	988	1031
1019	3063	3102	1196.135	959	986	1026
1020	2724	2725	1226.802	1001	977	1029
1021	2903	3387	1257.844	1012	987	1023
1022	3192	3193	1289.631	1017	982	1028
1023	2903	2989	1324.417	1021	979	1034
1024	2726	2842	1359.492	1015	1011	1032
1025	3009	3044	1395.355	978	997	1033
1026	2803	3063	1438.976	1005	1019	1031
1027	3566	3694	1483.793	1010	1006	1036
1028	3192	3420	1529.860	1022	1002	1039
1029	2724	2741	1583.129	1020	995	1035
1030	2722	2970	1639.287	1009	1004	1033
1031	2803	2854	1696.166	1026	1018	1038
1032	2726	2753	1753.061	1024	1008	1037
1033	2722	3009	1838.462	1030	1025	1038
1034	2787	2903	1931.501	1014	1023	1037
1035	2723	2724	2028.237	1016	1029	1040
1036	3220	3566	2127.700	1013	1027	1041
1037	2726	2787	2273.867	1032	1034	1039
1038	2722	2803	2477.102	1033	1031	1040
1039	2726	3192	2725.977	1037	1028	1041
1040	2722	2723	3038.427	1038	1035	1042
1041	2726	3220	3407.134	1039	1036	1042
1042	2722	2726	4168.000	1040	1041	0

# Adult's dendrogram





**Agglomeration Schedule**

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	3135	3143	.001	0	0	46
2	3242	3261	.005	0	0	110
3	3252	3253	.011	0	0	457
4	3215	3218	.016	0	0	561
5	3304	3309	.022	0	0	591
6	2975	2976	.028	0	0	587
7	3257	3272	.034	0	0	362
8	2909	2921	.040	0	0	641
9	3293	3301	.046	0	0	364
10	2717	2720	.053	0	0	304
11	2965	2980	.060	0	0	689
12	3290	3316	.068	0	0	215
13	3231	3249	.076	0	0	660
14	3291	3303	.085	0	0	132
15	3161	3167	.094	0	0	329
16	3578	3586	.104	0	0	524
17	2791	2792	.114	0	0	301
18	3572	3591	.124	0	0	315
19	2545	2550	.135	0	0	56
20	3238	3265	.146	0	0	360
21	3402	3427	.157	0	0	269
22	3315	3323	.169	0	0	576
23	3606	3619	.181	0	0	185
24	3103	3105	.193	0	0	190
25	2541	2557	.206	0	0	558
26	3371	3385	.219	0	0	495
27	2625	2643	.232	0	0	475
28	2592	2599	.246	0	0	112
29	3602	3609	.259	0	0	423
30	3114	3118	.273	0	0	456
31	2564	2569	.287	0	0	884
32	2626	2639	.301	0	0	259
33	2957	2969	.316	0	0	157
34	3523	3535	.330	0	0	198
35	2954	2981	.346	0	0	202
36	2926	2930	.361	0	0	625
37	3191	3205	.377	0	0	342
38	2533	2543	.393	0	0	180
39	2851	2857	.409	0	0	453
40	3016	3021	.426	0	0	88
41	3349	3373	.444	0	0	135
42	3600	3620	.461	0	0	116
43	2488	2499	.479	0	0	545
44	2633	2640	.497	0	0	460
45	3360	3369	.516	0	0	492
46	3133	3135	.534	0	1	323
47	3737	3745	.553	0	0	643
48	3352	3366	.572	0	0	451
49	2888	2911	.590	0	0	241
50	2996	3014	.609	0	0	875
51	2618	2619	.629	0	0	278
52	3644	3654	.648	0	0	548
53	2827	2831	.668	0	0	609
54	2880	2886	.688	0	0	716

55	3403	3421	.709	0	0	316
56	2524	2545	.729	0	19	943
57	3539	3556	.750	0	0	573
58	2568	2582	.771	0	0	513
59	3266	3275	.793	0	0	336
60	2936	2971	.814	0	0	532
61	3302	3330	.835	0	0	605
62	2819	2849	.857	0	0	101
63	2767	2771	.879	0	0	375
64	2905	2939	.900	0	0	673
65	2677	2682	.922	0	0	515
66	3182	3202	.944	0	0	440
67	3109	3126	.966	0	0	594
68	2875	2908	.988	0	0	553
69	3226	3244	1.010	0	0	477
70	3095	3098	1.033	0	0	456
71	2874	2884	1.055	0	0	657
72	3568	3576	1.078	0	0	416
73	2817	2845	1.101	0	0	555
74	2829	2837	1.123	0	0	419
75	3288	3311	1.146	0	0	400
76	3260	3292	1.170	0	0	210
77	2858	2859	1.193	0	0	348
78	2805	2832	1.217	0	0	377
79	3137	3180	1.241	0	0	827
80	3386	3391	1.265	0	0	218
81	2565	3130	1.289	0	0	313
82	3206	3222	1.313	0	0	238
83	2997	3012	1.337	0	0	435
84	2915	3184	1.362	0	0	445
85	2642	3313	1.386	0	0	257
86	3375	3377	1.411	0	0	605
87	3063	3064	1.436	0	0	989
88	3007	3016	1.461	0	40	438
89	3286	3325	1.486	0	0	974
90	2920	2947	1.511	0	0	240
91	3374	3399	1.536	0	0	165
92	3164	3177	1.561	0	0	961
93	2866	2878	1.587	0	0	609
94	3317	3351	1.613	0	0	766
95	2999	3001	1.639	0	0	706
96	3116	3141	1.665	0	0	674
97	3169	3192	1.692	0	0	426
98	2933	2964	1.718	0	0	516
99	2932	2970	1.745	0	0	224
100	3157	3158	1.772	0	0	856
101	2819	2825	1.800	62	0	523
102	2946	2951	1.827	0	0	522
103	3447	3454	1.854	0	0	811
104	2879	2899	1.882	0	0	554
105	2806	2828	1.911	0	0	449
106	2795	2801	1.939	0	0	338
107	2597	2610	1.968	0	0	278
108	2953	2960	1.997	0	0	549
109	2732	2757	2.027	0	0	436
110	3217	3242	2.056	0	2	620
111	3247	3279	2.086	0	0	612

112	2592	3186	2.115	28	0	499
113	2555	2882	2.146	0	0	592
114	2486	2497	2.177	0	0	413
115	2583	2897	2.208	0	0	240
116	3600	3626	2.239	42	0	540
117	2624	2637	2.270	0	0	460
118	3015	3025	2.301	0	0	490
119	3662	3671	2.332	0	0	679
120	3223	3240	2.364	0	0	654
121	3203	3234	2.396	0	0	575
122	3211	3212	2.427	0	0	412
123	3139	3154	2.459	0	0	333
124	2476	2782	2.491	0	0	488
125	2517	2522	2.523	0	0	507
126	3392	3416	2.556	0	0	394
127	3641	3645	2.588	0	0	634
128	3361	3380	2.621	0	0	368
129	3575	3621	2.654	0	0	418
130	3429	3433	2.687	0	0	1073
131	2910	2923	2.721	0	0	645
132	3291	3334	2.754	14	0	309
133	2753	2756	2.787	0	0	284
134	2793	2803	2.821	0	0	377
135	3349	3368	2.854	41	0	476
136	3489	3501	2.888	0	0	792
137	2959	3214	2.922	0	0	561
138	2820	2854	2.956	0	0	419
139	3099	3102	2.990	0	0	501
140	3227	3264	3.024	0	0	740
141	2794	3081	3.058	0	0	450
142	3093	3101	3.092	0	0	633
143	2943	2945	3.126	0	0	522
144	3065	3069	3.160	0	0	790
145	2490	2841	3.195	0	0	401
146	3584	3604	3.231	0	0	613
147	2902	2927	3.266	0	0	241
148	3632	3663	3.302	0	0	471
149	2661	2669	3.338	0	0	941
150	2919	3499	3.374	0	0	325
151	3437	3444	3.410	0	0	900
152	3104	3119	3.447	0	0	390
153	3017	3019	3.484	0	0	631
154	2988	3524	3.520	0	0	239
155	3552	3563	3.557	0	0	531
156	2889	2940	3.594	0	0	244
157	2957	2991	3.631	33	0	506
158	3598	3603	3.669	0	0	576
159	3207	3210	3.706	0	0	194
160	2796	2812	3.744	0	0	322
161	3129	3494	3.782	0	0	424
162	2850	2876	3.820	0	0	739
163	2863	3120	3.858	0	0	719
164	3107	3112	3.896	0	0	655
165	3374	3396	3.935	91	0	779
166	3505	3517	3.973	0	0	289
167	2750	2769	4.012	0	0	328
168	2815	2842	4.051	0	0	338

169	3040	3041	4.091	0	0	907
170	3251	3269	4.130	0	0	444
171	2560	2563	4.170	0	0	245
172	3614	3636	4.210	0	0	548
173	3245	3268	4.250	0	0	788
174	2455	2456	4.290	0	0	786
175	3195	3235	4.330	0	0	530
176	3412	3430	4.371	0	0	883
177	2579	2587	4.411	0	0	692
178	2906	2922	4.451	0	0	532
179	3020	3026	4.492	0	0	490
180	2533	2549	4.533	38	0	512
181	3492	3495	4.574	0	0	774
182	3436	3674	4.615	0	0	503
183	3033	3630	4.656	0	0	631
184	3347	3365	4.697	0	0	243
185	3606	3611	4.738	23	0	388
186	2465	2471	4.779	0	0	411
187	3236	3263	4.821	0	0	440
188	2895	2913	4.863	0	0	603
189	2979	2986	4.905	0	0	713
190	3103	3115	4.947	24	0	665
191	2601	2605	4.989	0	0	758
192	2824	2833	5.031	0	0	407
193	3577	3613	5.074	0	0	307
194	3207	3237	5.116	159	0	687
195	2865	2907	5.159	0	0	311
196	3005	3024	5.202	0	0	717
197	3241	3277	5.245	0	0	929
198	3523	3540	5.288	34	0	885
199	3029	3559	5.331	0	0	464
200	3142	3181	5.374	0	0	1083
201	3582	3596	5.417	0	0	496
202	2954	2966	5.461	35	0	547
203	3335	3355	5.505	0	0	794
204	2687	3655	5.549	0	0	514
205	2847	2873	5.593	0	0	641
206	3256	3283	5.637	0	0	477
207	2985	3000	5.682	0	0	516
208	3132	3155	5.726	0	0	674
209	3295	3312	5.771	0	0	788
210	3260	3298	5.816	76	0	591
211	2901	2904	5.862	0	0	735
212	2631	2992	5.907	0	0	475
213	3339	3348	5.953	0	0	611
214	2528	2551	5.999	0	0	430
215	3290	3299	6.045	12	0	468
216	2894	2912	6.092	0	0	681
217	3208	3220	6.140	0	0	405
218	3386	3387	6.187	80	0	733
219	3446	3449	6.235	0	0	410
220	2826	2834	6.283	0	0	595
221	2591	2596	6.331	0	0	619
222	2651	3533	6.379	0	0	489
223	2955	2973	6.428	0	0	645
224	2932	2948	6.477	99	0	587
225	3034	3379	6.525	0	0	844

226	2609	2616	6.574	0	0	700
227	2529	2535	6.623	0	0	439
228	2822	2861	6.673	0	0	716
229	2738	2747	6.722	0	0	295
230	3282	3328	6.772	0	0	809
231	2663	2671	6.821	0	0	455
232	3083	3084	6.871	0	0	714
233	2650	2664	6.921	0	0	566
234	3487	3500	6.972	0	0	347
235	3122	3159	7.023	0	0	552
236	3675	3676	7.074	0	0	793
237	3058	3061	7.125	0	0	904
238	3206	3219	7.176	82	0	745
239	2988	3527	7.229	154	0	646
240	2583	2920	7.281	115	90	443
241	2888	2902	7.334	49	147	801
242	3432	3448	7.386	0	0	414
243	3347	3390	7.439	184	0	787
244	2889	2931	7.492	156	0	392
245	2530	2560	7.545	0	171	910
246	2903	2916	7.599	0	0	664
247	2475	2766	7.652	0	0	841
248	3162	3179	7.706	0	0	445
249	2950	2982	7.760	0	0	549
250	2575	2590	7.814	0	0	454
251	3144	3152	7.868	0	0	726
252	2659	2660	7.922	0	0	572
253	3735	3741	7.976	0	0	724
254	2510	2523	8.031	0	0	557
255	2840	2862	8.085	0	0	952
256	2638	2654	8.140	0	0	324
257	2641	2642	8.196	0	85	858
258	2814	2835	8.252	0	0	556
259	2626	2629	8.308	32	0	489
260	3564	3566	8.364	0	0	346
261	3165	3194	8.420	0	0	795
262	2978	3011	8.477	0	0	717
263	3411	3634	8.533	0	0	471
264	3587	3612	8.590	0	0	684
265	3682	3701	8.647	0	0	518
266	2439	2445	8.704	0	0	601
267	3601	3616	8.760	0	0	698
268	2956	2958	8.817	0	0	706
269	3397	3402	8.874	0	21	357
270	3333	3342	8.932	0	0	345
271	3554	3590	8.989	0	0	577
272	3320	3343	9.046	0	0	482
273	3239	3513	9.104	0	0	731
274	2495	2823	9.162	0	0	696
275	3382	3383	9.221	0	0	539
276	2816	2846	9.280	0	0	728
277	2784	2790	9.339	0	0	849
278	2597	2618	9.398	107	51	862
279	3306	3346	9.458	0	0	395
280	3550	3607	9.518	0	0	349
281	2924	2949	9.577	0	0	625
282	3074	3090	9.638	0	0	761

283	3679	3690	9.698	0	0	784
284	2753	2788	9.758	133	0	915
285	3474	3479	9.819	0	0	497
286	2952	2972	9.880	0	0	770
287	3491	3496	9.941	0	0	669
288	3035	3647	10.002	0	0	1086
289	3505	3512	10.063	166	0	792
290	2602	2628	10.125	0	0	875
291	3404	3425	10.186	0	0	708
292	3106	3113	10.248	0	0	474
293	3071	3091	10.310	0	0	594
294	2780	2783	10.371	0	0	340
295	2735	2738	10.433	0	229	637
296	3660	3667	10.495	0	0	615
297	2686	2694	10.558	0	0	831
298	3359	3362	10.620	0	0	839
299	2761	2809	10.683	0	0	688
300	3451	3456	10.746	0	0	534
301	2791	2821	10.809	17	0	555
302	3319	3370	10.872	0	0	560
303	2984	2987	10.935	0	0	752
304	2717	2718	10.998	10	0	772
305	2614	3197	11.062	0	0	513
306	2487	2506	11.125	0	0	904
307	3577	3617	11.189	193	0	980
308	3224	3274	11.253	0	0	791
309	3278	3291	11.318	0	132	480
310	2562	2584	11.382	0	0	614
311	2865	2881	11.447	195	0	657
312	2665	2678	11.512	0	0	922
313	2553	2565	11.577	0	81	614
314	2573	2603	11.642	0	0	598
315	3572	3615	11.707	18	0	541
316	3403	3439	11.772	55	0	589
317	3121	3163	11.838	0	0	668
318	3426	3438	11.904	0	0	493
319	3419	3643	11.970	0	0	901
320	3435	3443	12.037	0	0	626
321	2566	2598	12.104	0	0	686
322	2796	2852	12.171	160	0	722
323	3133	3166	12.239	46	0	396
324	2638	2656	12.307	256	0	712
325	2900	2919	12.375	0	150	669
326	2961	2968	12.444	0	0	689
327	2681	3589	12.513	0	0	727
328	2734	2750	12.582	0	167	747
329	3161	3213	12.651	15	0	726
330	3123	3124	12.720	0	0	380
331	2798	2808	12.790	0	0	544
332	2742	2746	12.859	0	0	652
333	3127	3139	12.929	0	123	390
334	2733	2748	12.998	0	0	682
335	3053	3059	13.068	0	0	714
336	3266	3297	13.138	59	0	783
337	2474	2479	13.209	0	0	817
338	2795	2815	13.279	106	168	849
339	2505	2542	13.350	0	0	723

340	2763	2780	13.421	0	294	595
341	2785	2804	13.492	0	0	705
342	3191	3246	13.564	37	0	466
343	3128	3170	13.635	0	0	655
344	2653	2994	13.707	0	0	834
345	3333	3354	13.779	270	0	891
346	3542	3564	13.852	0	260	585
347	3487	3498	13.925	234	0	1045
348	2858	2868	13.997	77	0	553
349	3550	3573	14.070	280	0	650
350	3711	3724	14.145	0	0	469
351	3340	3356	14.219	0	0	960
352	2995	3022	14.294	0	0	618
353	3096	3100	14.368	0	0	665
354	2515	2544	14.443	0	0	592
355	3075	3078	14.519	0	0	810
356	3070	3094	14.594	0	0	616
357	3397	3669	14.670	269	0	503
358	3471	3475	14.745	0	0	636
359	2745	2759	14.821	0	0	550
360	3238	3258	14.896	20	0	913
361	3367	3389	14.973	0	0	671
362	3257	3331	15.049	7	0	740
363	3543	3551	15.126	0	0	473
364	3255	3293	15.203	0	9	903
365	3580	3642	15.279	0	0	693
366	3610	3639	15.356	0	0	679
367	3055	3056	15.433	0	0	798
368	3345	3361	15.511	0	128	504
369	3372	3395	15.588	0	0	789
370	3635	3668	15.666	0	0	727
371	3493	3508	15.743	0	0	735
372	3085	3087	15.821	0	0	450
373	2615	2649	15.899	0	0	607
374	2843	2872	15.978	0	0	447
375	2767	2813	16.057	63	0	970
376	3514	3534	16.137	0	0	494
377	2793	2805	16.218	134	78	833
378	2890	3156	16.298	0	0	635
379	2990	3003	16.379	0	0	822
380	3123	3183	16.460	330	0	829
381	3567	3597	16.541	0	0	925
382	3054	3072	16.622	0	0	798
383	2581	2617	16.704	0	0	748
384	2611	2630	16.786	0	0	1035
385	3271	3273	16.868	0	0	745
386	3160	3216	16.951	0	0	530
387	2504	2511	17.035	0	0	467
388	3606	3625	17.118	185	0	866
389	3134	3196	17.202	0	0	829
390	3104	3127	17.285	152	333	1000
391	2672	3624	17.369	0	0	524
392	2889	2914	17.454	244	0	874
393	3092	3097	17.539	0	0	744
394	3381	3392	17.624	0	126	492
395	3306	3326	17.709	279	0	836
396	2918	3133	17.794	0	323	874

397	2838	2848	17.880	0	0	851
398	2622	3221	17.966	0	0	927
399	2612	2621	18.052	0	0	815
400	3250	3288	18.138	0	75	509
401	2490	2513	18.225	145	0	739
402	3545	3581	18.312	0	0	588
403	2567	2572	18.399	0	0	832
404	3712	3729	18.486	0	0	469
405	3208	3233	18.575	217	0	721
406	3151	3188	18.664	0	0	930
407	2776	2824	18.753	0	192	778
408	3111	3125	18.842	0	0	680
409	2492	2503	18.931	0	0	610
410	3446	3708	19.021	219	0	653
411	2465	2472	19.111	186	0	835
412	3211	3259	19.201	122	0	731
413	2483	2486	19.292	0	114	899
414	3432	3442	19.382	242	0	811
415	3296	3300	19.473	0	0	903
416	3568	3599	19.564	72	0	866
417	3686	3706	19.656	0	0	972
418	3344	3575	19.748	0	129	789
419	2820	2829	19.840	138	74	736
420	3699	3714	19.933	0	0	1078
421	3287	3337	20.026	0	0	764
422	3364	3423	20.119	0	0	949
423	3602	3627	20.212	29	0	860
424	3129	3504	20.306	161	0	968
425	2739	2772	20.400	0	0	711
426	3169	3262	20.495	97	0	912
427	2786	2830	20.590	0	0	998
428	3146	3149	20.685	0	0	800
429	3558	3571	20.781	0	0	593
430	2528	2570	20.876	214	0	912
431	2534	2574	20.972	0	0	765
432	3526	3548	21.069	0	0	573
433	3531	3549	21.165	0	0	767
434	3185	3189	21.262	0	0	584
435	2997	3002	21.360	83	0	842
436	2732	2740	21.457	109	0	711
437	2494	2802	21.555	0	0	824
438	3007	3562	21.653	88	0	730
439	2529	2561	21.752	227	0	870
440	3182	3236	21.851	66	187	837
441	2760	2762	21.951	0	0	667
442	2571	2576	22.050	0	0	686
443	2583	2877	22.150	240	0	670
444	3228	3251	22.251	0	170	654
445	2915	3162	22.352	84	248	719
446	3010	3028	22.453	0	0	852
447	2843	2869	22.554	374	0	757
448	2507	2509	22.656	0	0	749
449	2773	2806	22.758	0	105	833
450	2794	3085	22.861	141	372	790
451	3352	3633	22.964	48	0	708
452	3006	3023	23.068	0	0	993
453	2851	3145	23.172	39	0	801



454	2575	2595	23.276	250	0	931
455	2663	2670	23.381	231	0	914
456	3095	3114	23.487	70	30	810
457	3252	3307	23.592	3	0	620
458	3473	3486	23.698	0	0	846
459	3138	3153	23.804	0	0	795
460	2624	2633	23.910	117	44	694
461	3570	3648	24.017	0	0	693
462	3518	3538	24.124	0	0	821
463	3458	3460	24.231	0	0	985
464	3029	3622	24.339	199	0	834
465	3593	3652	24.447	0	0	685
466	3191	3276	24.555	342	0	976
467	2501	2504	24.664	0	387	1039
468	3290	3329	24.774	215	0	937
469	3711	3712	24.884	350	404	907
470	2540	2546	24.994	0	0	581
471	3411	3632	25.104	263	148	923
472	3407	3424	25.215	0	0	900
473	3543	3546	25.326	363	0	1023
474	3106	3171	25.437	292	0	871
475	2625	2631	25.548	27	212	862
476	3349	3422	25.660	135	0	710
477	3226	3256	25.772	69	206	794
478	3322	3358	25.884	0	0	710
479	3018	3310	25.996	0	0	766
480	3278	3363	26.109	309	0	1032
481	3694	3713	26.222	0	0	580
482	3318	3320	26.335	0	272	905
483	2585	2634	26.448	0	0	758
484	3661	3664	26.562	0	0	773
485	3172	3178	26.676	0	0	827
486	3628	3640	26.791	0	0	698
487	2675	2685	26.905	0	0	701
488	2476	2765	27.020	124	0	814
489	2626	2651	27.135	259	222	963
490	3015	3020	27.250	118	179	618
491	3067	3082	27.365	0	0	680
492	3360	3381	27.481	45	394	939
493	3406	3426	27.597	0	318	779
494	2594	3514	27.713	0	376	987
495	3338	3371	27.829	0	26	928
496	3582	3653	27.945	201	0	859
497	3108	3474	28.061	0	285	802
498	3480	3509	28.179	0	0	908
499	2586	2592	28.296	0	112	892
500	2458	2463	28.413	0	0	1038
501	3073	3099	28.530	0	139	845
502	2929	3232	28.648	0	0	661
503	3397	3436	28.766	357	182	948
504	3345	3376	28.886	368	0	948
505	3502	3530	29.005	0	0	908
506	2944	2957	29.124	0	157	842
507	2502	2517	29.244	0	125	999
508	3045	3049	29.363	0	0	1036
509	3250	3353	29.483	400	0	836
510	3076	3088	29.603	0	0	1021

511	3037	3414	29.723	0	0	920
512	2518	2533	29.843	0	180	899
513	2568	2614	29.965	58	305	700
514	2687	3684	30.088	204	0	1005
515	2677	2684	30.211	65	0	831
516	2933	2985	30.334	98	207	820
517	3742	3755	30.457	0	0	630
518	3682	3697	30.580	265	0	751
519	2775	2811	30.704	0	0	722
520	2928	2934	30.828	0	0	807
521	2774	2777	30.952	0	0	872
522	2943	2946	31.077	143	102	819
523	2787	2819	31.202	0	101	870
524	2672	3578	31.327	391	16	868
525	2749	3469	31.452	0	0	964
526	2527	2532	31.579	0	0	748
527	2443	3046	31.705	0	0	1044
528	2452	2459	31.832	0	0	977
529	2491	2526	31.959	0	0	909
530	3160	3195	32.086	386	175	687
531	3552	3561	32.213	155	0	854
532	2906	2936	32.340	178	60	820
533	2636	2652	32.468	0	0	1004
534	3434	3451	32.596	0	300	947
535	3685	3710	32.724	0	0	677
536	3384	3431	32.852	0	0	776
537	3608	3659	32.980	0	0	877
538	3657	3693	33.109	0	0	996
539	3327	3382	33.237	0	275	809
540	3565	3600	33.366	0	116	984
541	3572	3588	33.496	315	0	613
542	3709	3723	33.626	0	0	659
543	3147	3204	33.756	0	0	721
544	2798	3477	33.887	331	0	824
545	2484	2488	34.018	0	43	648
546	2885	2935	34.149	0	0	1110
547	2937	2954	34.281	0	202	822
548	3614	3644	34.412	172	52	980
549	2950	2953	34.545	249	108	927
550	2726	2745	34.677	0	359	966
551	3393	3409	34.810	0	0	776
552	3122	3187	34.943	235	0	1016
553	2858	2875	35.077	348	68	1011
554	2853	2879	35.210	0	104	838
555	2791	2817	35.344	301	73	970
556	2789	2814	35.478	0	258	882
557	2510	2519	35.612	254	0	696
558	2541	2556	35.746	25	0	931
559	3466	3467	35.881	0	0	769
560	3319	3350	36.016	302	0	629
561	2959	3215	36.152	137	4	783
562	3267	3569	36.288	0	0	932
563	2883	3488	36.425	0	0	699
564	2552	2604	36.562	0	0	1033
565	3510	3529	36.699	0	0	968
566	2650	2666	36.836	233	0	1142
567	3528	3557	36.974	0	0	1010

568	3173	3254	37.113	0	0	885
569	3417	3418	37.252	0	0	953
570	2454	2467	37.392	0	0	995
571	3284	3305	37.533	0	0	741
572	2658	2659	37.674	0	252	950
573	3526	3539	37.815	432	57	821
574	2770	2818	37.958	0	0	729
575	3190	3203	38.101	0	121	857
576	3315	3598	38.244	22	158	859
577	3554	3618	38.388	271	0	925
578	3047	3052	38.532	0	0	1115
579	2451	2712	38.676	0	0	861
580	3688	3694	38.820	0	481	889
581	2520	2540	38.965	0	470	1003
582	3583	3650	39.109	0	0	868
583	3321	3401	39.254	0	0	1061
584	3136	3185	39.399	0	434	962
585	3522	3542	39.545	0	346	932
586	2496	2558	39.691	0	0	909
587	2932	2975	39.837	224	6	936
588	3545	3638	39.983	402	0	876
589	3403	3441	40.130	316	0	911
590	2727	2754	40.277	0	0	882
591	3260	3304	40.425	210	5	764
592	2515	2555	40.574	354	113	777
593	3555	3558	40.723	0	429	848
594	3071	3109	40.872	293	67	997
595	2763	2826	41.022	340	220	1119
596	3683	3692	41.172	0	0	1041
597	3707	3719	41.322	0	0	1080
598	2573	2578	41.473	314	0	771
599	2807	3060	41.623	0	0	978
600	3703	3718	41.774	0	0	720
601	2439	2461	41.925	266	0	1027
602	2721	2752	42.078	0	0	1037
603	2836	2895	42.231	0	188	847
604	3743	3750	42.385	0	0	985
605	3302	3375	42.539	61	86	940
606	2481	2498	42.693	0	0	817
607	2615	2648	42.848	373	0	815
608	3646	3677	43.003	0	0	887
609	2827	2866	43.159	53	93	736
610	2492	2521	43.314	409	0	1006
611	3332	3339	43.470	0	213	883
612	3247	3294	43.627	111	0	960
613	3572	3584	43.786	541	146	901
614	2553	2562	43.946	313	310	892
615	3660	3673	44.106	296	0	893
616	3070	3080	44.267	356	0	1016
617	3476	3490	44.427	0	0	846
618	2995	3015	44.587	352	490	1102
619	2591	2607	44.748	221	0	1047
620	3217	3252	44.909	110	457	1088
621	3341	3623	45.070	0	0	684
622	2917	2925	45.231	0	0	664
623	2537	2547	45.393	0	0	867
624	3520	3560	45.555	0	0	1028

625	2924	2926	45.719	281	36	1014
626	3435	3440	45.883	320	0	1059
627	2620	2667	46.048	0	0	905
628	2600	2644	46.216	0	0	888
629	3319	3420	46.384	560	0	1085
630	3736	3742	46.553	0	517	1167
631	3017	3033	46.722	153	183	878
632	2778	2855	46.891	0	0	898
633	3086	3093	47.061	0	142	1022
634	3641	3649	47.230	127	0	828
635	2890	3229	47.400	378	0	683
636	3468	3471	47.570	0	358	1052
637	2735	2797	47.741	295	0	823
638	3209	3285	47.912	0	0	916
639	2435	2440	48.083	0	0	881
640	3201	3281	48.255	0	0	1125
641	2847	2909	48.427	205	8	1062
642	3717	3728	48.599	0	0	889
643	3732	3737	48.772	0	47	935
644	2531	2577	48.946	0	0	1116
645	2910	2955	49.120	131	223	918
646	2988	3544	49.295	239	0	936
647	2679	3027	49.470	0	0	955
648	2484	2516	49.647	545	0	799
649	2485	3057	49.824	0	0	1029
650	3521	3550	50.001	0	349	854
651	2645	2657	50.179	0	0	888
652	2725	2742	50.357	0	332	772
653	3446	3457	50.536	410	0	1171
654	3223	3228	50.717	120	444	957
655	3107	3128	50.897	164	343	959
656	2478	2839	51.078	0	0	841
657	2865	2874	51.259	311	71	819
658	3398	3415	51.441	0	0	1013
659	2695	3709	51.624	0	542	880
660	3008	3231	51.807	0	13	951
661	2929	3148	51.991	502	0	896
662	3243	3308	52.174	0	0	886
663	2898	3193	52.358	0	0	916
664	2903	2917	52.542	246	622	958
665	3096	3103	52.728	353	190	845
666	3462	3464	52.913	0	0	1090
667	2743	2760	53.099	0	441	979
668	3121	3140	53.285	317	0	930
669	2900	3491	53.471	325	287	774
670	2525	2583	53.658	0	443	1020
671	3367	3405	53.845	361	0	1087
672	2810	2860	54.032	0	0	807
673	2905	2941	54.220	64	0	1014
674	3116	3132	54.410	96	208	871
675	2711	2730	54.600	0	0	933
676	2714	2729	54.790	0	0	986
677	3685	3715	54.981	535	0	1060
678	2715	2723	55.172	0	0	1025
679	3610	3662	55.364	366	119	984
680	3067	3111	55.556	491	408	856
681	2894	2896	55.748	216	0	1034

682	2728	2733	55.942	0	334	992
683	2890	2942	56.137	635	0	896
684	3341	3587	56.332	621	264	1105
685	3593	3665	56.527	465	0	893
686	2566	2571	56.723	321	442	754
687	3160	3207	56.919	530	194	857
688	2761	2799	57.117	299	0	975
689	2961	2965	57.315	326	11	988
690	2668	3670	57.515	0	0	926
691	3681	3720	57.714	0	0	784
692	2579	2613	57.914	177	0	840
693	3570	3580	58.116	461	365	742
694	2624	2646	58.317	460	0	743
695	3658	3672	58.521	0	0	1046
696	2495	2510	58.725	274	557	1108
697	3270	3336	58.929	0	0	1155
698	3601	3628	59.134	267	486	996
699	2883	3515	59.338	563	0	1072
700	2568	2609	59.544	513	226	987
701	2673	2675	59.750	0	487	922
702	3753	3759	59.956	0	0	924
703	2450	2460	60.163	0	0	973
704	2438	2449	60.372	0	0	786
705	2755	2785	60.582	0	341	843
706	2956	2999	60.791	268	95	1051
707	3199	3225	61.002	0	0	929
708	3352	3404	61.212	451	291	839
709	3174	3198	61.423	0	0	954
710	3322	3349	61.635	478	476	940
711	2732	2739	61.847	436	425	966
712	2635	2638	62.063	0	324	1004
713	2887	2979	62.285	0	189	770
714	3053	3083	62.508	335	232	818
715	2977	3324	62.731	0	0	1072
716	2822	2880	62.956	228	54	838
717	2978	3005	63.180	262	196	951
718	2457	2468	63.406	0	0	934
719	2863	2915	63.633	163	445	1065
720	3703	3725	63.859	600	0	865
721	3147	3208	64.086	543	405	1139
722	2775	2796	64.313	519	322	872
723	2493	2505	64.540	0	339	1069
724	3716	3735	64.768	0	253	1008
725	3048	3051	64.995	0	0	1044
726	3144	3161	65.225	251	329	791
727	2681	3635	65.455	327	370	787
728	2764	2816	65.687	0	276	1098
729	2758	2770	65.920	0	574	915
730	3007	3013	66.154	438	0	944
731	3211	3239	66.388	412	273	1122
732	2856	2870	66.627	0	0	851
733	3386	3413	66.866	218	0	911
734	3066	3117	67.106	0	0	1042
735	2901	3493	67.346	211	371	847
736	2820	2827	67.586	419	609	1063
737	3722	3746	67.827	0	0	1012
738	2974	2989	68.069	0	0	955

739	2490	2850	68.311	401	162	1011
740	3227	3257	68.554	140	362	837
741	3176	3284	68.797	0	571	1071
742	3570	3651	69.041	693	0	1150
743	2624	2647	69.285	694	0	950
744	3079	3092	69.530	0	393	826
745	3206	3271	69.775	238	385	1107
746	3532	3585	70.022	0	0	1079
747	2719	2734	70.268	0	328	814
748	2527	2581	70.517	526	383	884
749	2500	2507	70.765	0	448	1116
750	3629	3631	71.016	0	0	887
751	3682	3702	71.267	518	0	850
752	2984	3032	71.519	303	0	1034
753	2674	2691	71.772	0	0	906
754	2539	2566	72.027	0	686	910
755	2469	2477	72.281	0	0	830
756	2716	2722	72.536	0	0	890
757	2843	2871	72.792	447	0	1095
758	2585	2601	73.049	483	191	941
759	3168	3230	73.307	0	0	965
760	2589	2632	73.567	0	0	1007
761	3074	3131	73.827	282	0	961
762	2983	3592	74.089	0	0	1046
763	2744	2779	74.352	0	0	1157
764	3260	3287	74.615	591	421	1056
765	2508	2534	74.879	0	431	943
766	3018	3317	75.143	479	94	1055
767	3519	3531	75.408	0	433	1106
768	3453	3459	75.674	0	0	947
769	3465	3466	75.941	0	559	1170
770	2887	2952	76.209	713	286	1051
771	2573	2588	76.479	598	0	1131
772	2717	2725	76.751	304	652	1118
773	3661	3698	77.025	484	0	793
774	2900	3492	77.300	669	181	1094
775	3731	3733	77.575	0	0	1068
776	3384	3393	77.850	536	551	1066
777	2515	2559	78.125	592	0	1063
778	2536	2776	78.401	0	407	1039
779	3374	3406	78.678	165	493	1089
780	3704	3726	78.955	0	0	808
781	3036	3410	79.234	0	0	939
782	2707	2731	79.513	0	0	1076
783	2959	3266	79.793	561	336	1015
784	3679	3681	80.074	283	691	1101
785	2470	2512	80.356	0	0	1024
786	2438	2455	80.639	704	174	977
787	2681	3347	80.923	727	243	1129
788	3245	3295	81.210	173	209	928
789	3344	3372	81.498	418	369	944
790	2794	3065	81.786	450	144	959
791	3144	3224	82.075	726	308	1158
792	3489	3505	82.363	136	289	1045
793	3661	3675	82.652	773	236	1054
794	3226	3335	82.942	477	203	913
795	3138	3165	83.238	459	261	1064

796	2462	3062	83.536	0	0	1026
797	2867	2892	83.835	0	0	898
798	3054	3055	84.139	382	367	978
799	2473	2484	84.443	0	648	1153
800	3068	3146	84.748	0	428	1022
801	2851	2888	85.053	453	241	1104
802	3108	3472	85.361	497	0	1001
803	3730	3738	85.670	0	0	1060
804	3525	3579	85.983	0	0	938
805	2680	3678	86.297	0	0	1092
806	2623	2993	86.611	0	0	1053
807	2810	2928	86.927	672	520	1184
808	3691	3704	87.243	0	780	1219
809	3282	3327	87.560	230	539	1032
810	3075	3095	87.880	355	456	1136
811	3432	3447	88.202	414	103	1049
812	3289	3400	88.527	0	0	1017
813	3754	3756	88.852	0	0	1074
814	2476	2719	89.178	488	747	995
815	2612	2615	89.505	399	607	858
816	2538	2593	89.833	0	0	1006
817	2474	2481	90.161	337	606	1096
818	3050	3053	90.490	0	714	989
819	2865	2943	90.821	657	522	918
820	2906	2933	91.152	532	516	1198
821	3518	3526	91.487	462	573	1106
822	2937	2990	91.823	547	379	1156
823	2735	2781	92.159	637	0	1037
824	2494	2798	92.495	437	544	979
825	3747	3748	92.834	0	0	1223
826	3077	3079	93.174	0	744	1202
827	3137	3172	93.515	79	485	942
828	3641	3689	93.857	634	0	1111
829	3123	3134	94.200	380	389	1050
830	2469	2480	94.543	755	0	1174
831	2677	2686	94.886	515	297	1080
832	2567	3511	95.230	403	0	971
833	2773	2793	95.574	449	377	992
834	2653	3029	95.918	344	464	878
835	2453	2465	96.262	0	411	1154
836	3250	3306	96.608	509	395	957
837	3182	3227	96.955	440	740	976
838	2822	2853	97.303	716	554	1127
839	3352	3359	97.653	708	298	923
840	2579	3537	98.005	692	0	963
841	2475	2478	98.358	247	656	1093
842	2944	2997	98.714	506	435	988
843	2736	2755	99.071	0	705	967
844	3034	3038	99.433	225	0	1099
845	3073	3096	99.797	501	665	997
846	3473	3476	100.165	458	617	1001
847	2836	2901	100.537	603	735	998
848	3555	3574	100.910	593	0	1077
849	2784	2795	101.285	277	338	1127
850	3682	3700	101.664	751	0	972
851	2838	2856	102.046	397	732	1062
852	3009	3010	102.427	0	446	1055

853	2464	2800	102.811	0	0	1211
854	3521	3552	103.195	650	531	860
855	2706	2708	103.579	0	0	1084
856	3067	3157	103.964	680	100	1067
857	3160	3190	104.351	687	575	1148
858	2612	2641	104.738	815	257	1120
859	3315	3582	105.130	576	496	990
860	3521	3602	105.526	854	423	1137
861	2433	2451	105.923	0	579	1168
862	2597	2625	106.320	278	475	1103
863	2514	2608	106.718	0	0	1190
864	2430	2432	107.117	0	0	1212
865	3666	3703	107.520	0	720	969
866	3568	3606	107.926	416	388	1054
867	2537	2580	108.339	623	0	945
868	2672	3583	108.753	524	582	1005
869	2606	2676	109.169	0	0	946
870	2529	2787	109.585	439	523	1020
871	3106	3116	110.001	474	674	1050
872	2774	2775	110.421	521	722	1119
873	3727	3744	110.843	0	0	1082
874	2889	2918	111.266	392	396	1065
875	2602	2996	111.689	290	50	958
876	2963	3545	112.112	0	588	1086
877	3594	3608	112.536	0	537	1240
878	2653	3017	112.960	834	631	1205
879	3516	3637	113.386	0	0	1077
880	2692	2695	113.816	0	659	1161
881	2435	2447	114.247	639	0	973
882	2727	2789	114.679	590	556	975
883	3332	3412	115.111	611	176	1091
884	2527	2564	115.544	748	31	1142
885	3173	3523	115.977	568	198	1150
886	3243	3394	116.411	662	0	1132
887	3629	3646	116.847	750	608	1176
888	2600	2645	117.284	628	651	1109
889	3688	3717	117.722	580	642	1167
890	2716	2737	118.160	756	0	1179
891	3248	3333	118.599	0	345	937
892	2553	2586	119.040	614	499	1220
893	3593	3660	119.481	685	615	1048
894	3470	3484	119.924	0	0	1221
895	3481	3485	120.370	0	0	1052
896	2890	2929	120.818	683	661	1130
897	3175	3200	121.266	0	0	965
898	2778	2867	121.715	632	797	1149
899	2483	2518	122.166	413	512	1108
900	3407	3437	122.618	472	151	1175
901	3419	3572	123.073	319	613	1195
902	2702	2703	123.534	0	0	1118
903	3255	3296	123.997	364	415	1066
904	2487	3058	124.465	306	237	1029
905	2620	3318	124.934	627	482	1091
906	2674	3450	125.404	753	0	1178
907	3040	3711	125.876	169	469	1101
908	3480	3502	126.350	498	505	1182
909	2491	2496	126.825	529	586	1164



910	2530	2539	127.300	245	754	1172
911	3386	3403	127.776	733	589	1049
912	2528	3169	128.252	430	426	1000
913	3226	3238	128.731	794	360	1201
914	2663	2690	129.211	455	0	1120
915	2753	2758	129.692	284	729	1098
916	2898	3209	130.175	663	638	1181
917	3758	3762	130.659	0	0	1012
918	2865	2910	131.144	819	645	1216
919	2768	2891	131.629	0	0	1113
920	3030	3037	132.122	0	511	993
921	2704	2705	132.615	0	0	1097
922	2665	2673	133.109	312	701	1031
923	3352	3411	133.607	839	471	1185
924	3753	3763	134.107	702	0	994
925	3554	3567	134.606	577	381	1010
926	2668	3687	135.106	690	0	1162
927	2622	2950	135.609	398	549	1103
928	3245	3338	136.114	788	495	974
929	3199	3241	136.620	707	197	1017
930	3121	3151	137.127	668	406	962
931	2541	2575	137.636	558	454	1134
932	3267	3522	138.145	562	585	990
933	2701	2711	138.656	0	675	1025
934	2437	2457	139.170	0	718	1024
935	3732	3760	139.689	643	0	1074
936	2932	2988	140.210	587	646	1126
937	3248	3290	140.731	891	468	1100
938	3525	3605	141.264	804	0	1188
939	3036	3360	141.800	781	492	1059
940	3302	3322	142.336	605	710	1085
941	2585	2661	142.876	758	149	1035
942	3137	3280	143.418	827	0	1181
943	2508	2524	143.962	765	56	1047
944	3007	3344	144.508	730	789	1099
945	2489	2537	145.056	0	867	1069
946	2606	2655	145.608	869	0	1040
947	3434	3453	146.162	534	768	1160
948	3345	3397	146.716	504	503	1089
949	2998	3364	147.274	0	422	1071
950	2624	2658	147.833	743	572	1189
951	2978	3008	148.398	717	660	1015
952	2840	2938	148.963	255	0	1149
953	3417	3428	149.529	569	0	1061
954	3174	3357	150.099	709	0	1151
955	2679	2974	150.683	647	738	1112
956	2844	2864	151.271	0	0	1133
957	3223	3250	151.860	654	836	1056
958	2602	2903	152.450	875	664	1053
959	2794	3107	153.040	790	655	1136
960	3247	3340	153.636	612	351	1144
961	3074	3164	154.232	761	92	1083
962	3121	3136	154.834	930	584	1202
963	2579	2626	155.437	840	489	1023
964	2446	2749	156.040	0	525	1075
965	3168	3175	156.644	759	897	1194
966	2726	2732	157.250	550	711	1076

967	2724	2736	157.861	0	843	1157
968	3129	3510	158.479	424	565	1208
969	3666	3721	159.099	865	0	1196
970	2767	2791	159.720	375	555	1159
971	2567	3506	160.343	832	0	1122
972	3682	3686	160.967	850	417	1160
973	2435	2450	161.596	881	703	1070
974	3245	3286	162.227	928	89	1139
975	2727	2761	162.864	882	688	1180
976	3182	3191	163.503	837	466	1088
977	2438	2452	164.143	786	528	1038
978	2807	3054	164.784	599	798	1036
979	2494	2743	165.426	824	667	1095
980	3577	3614	166.083	307	548	1105
981	2700	2710	166.745	0	0	1097
982	3031	3696	167.407	0	0	1173
983	3740	3761	168.076	0	0	1123
984	3565	3610	168.746	540	679	1137
985	3458	3743	169.418	463	604	1090
986	2698	2714	170.098	0	676	1084
987	2568	2594	170.783	700	494	1126
988	2944	2961	171.470	842	689	1156
989	3050	3063	172.162	818	87	1021
990	3267	3315	172.853	932	859	1213
991	3536	3547	173.548	0	0	1147
992	2728	2773	174.247	682	833	1159
993	3006	3030	174.948	452	920	1241
994	3752	3753	175.649	0	924	1226
995	2454	2476	176.354	570	814	1141
996	3601	3657	177.058	698	538	1111
997	3071	3073	177.764	594	845	1064
998	2786	2836	178.470	427	847	1145
999	2466	2502	179.185	0	507	1096
1000	2528	3104	179.906	912	390	1104
1001	3108	3473	180.628	802	846	1208
1002	3478	3507	181.354	0	0	1121
1003	2482	2520	182.080	0	581	1207
1004	2635	2636	182.826	712	533	1172
1005	2672	2687	183.584	868	514	1235
1006	2492	2538	184.344	610	816	1217
1007	2554	2589	185.105	0	760	1190
1008	3716	3734	185.865	724	0	1082
1009	3463	3751	186.629	0	0	1114
1010	3528	3554	187.396	567	925	1200
1011	2490	2858	188.170	739	553	1146
1012	3722	3758	188.951	737	917	1223
1013	3039	3398	189.733	0	658	1112
1014	2905	2924	190.518	673	625	1145
1015	2959	2978	191.312	783	951	1201
1016	3070	3122	192.112	616	552	1042
1017	3199	3289	192.915	929	812	1204
1018	3482	3497	193.720	0	0	1121
1019	3452	3461	194.527	0	0	1214
1020	2525	2529	195.336	670	870	1146
1021	3050	3076	196.148	989	510	1236
1022	3068	3086	196.960	800	633	1067
1023	2579	3543	197.776	963	473	1134

1024	2437	2470	198.592	934	785	1168
1025	2701	2715	199.420	933	678	1233
1026	2462	3044	200.247	796	0	1138
1027	2439	2444	201.079	601	0	1124
1028	3520	3553	201.910	624	0	1281
1029	2485	2487	202.745	649	904	1177
1030	3089	3150	203.580	0	0	1253
1031	2662	2665	204.418	0	922	1227
1032	3278	3282	205.258	480	809	1107
1033	2552	2627	206.104	564	0	1109
1034	2894	2984	206.960	681	752	1199
1035	2585	2611	207.818	941	384	1186
1036	2807	3045	208.680	978	508	1259
1037	2721	2735	209.548	602	823	1115
1038	2438	2458	210.421	977	500	1124
1039	2501	2536	211.296	467	778	1093
1040	2606	2689	212.178	946	0	1140
1041	3680	3683	213.064	0	596	1079
1042	3066	3070	213.956	734	1016	1193
1043	2683	2696	214.851	0	0	1161
1044	2443	3048	215.749	527	725	1177
1045	3487	3489	216.650	347	792	1094
1046	2983	3658	217.552	762	695	1206
1047	2508	2591	218.454	943	619	1211
1048	3593	3705	219.361	893	0	1215
1049	3386	3432	220.273	911	811	1228
1050	3106	3123	221.186	871	829	1148
1051	2887	2956	222.100	770	706	1102
1052	3468	3481	223.016	636	895	1135
1053	2602	2623	223.933	958	806	1110
1054	3568	3661	224.865	866	793	1195
1055	3009	3018	225.810	852	766	1198
1056	3223	3260	226.757	957	764	1213
1057	2431	2442	227.712	0	0	1169
1058	3378	3445	228.670	0	0	1155
1059	3036	3435	229.630	939	626	1185
1060	3685	3730	230.602	677	803	1196
1061	3321	3417	231.574	583	953	1251
1062	2838	2847	232.548	851	641	1130
1063	2515	2820	233.528	777	736	1229
1064	3071	3138	234.509	997	795	1203
1065	2863	2889	235.493	719	874	1166
1066	3255	3384	236.484	903	776	1228
1067	3067	3068	237.486	856	1022	1158
1068	3731	3749	238.491	775	0	1271
1069	2489	2493	239.506	945	723	1249
1070	2434	2435	240.523	0	973	1285
1071	2998	3176	241.548	949	741	1265
1072	2883	2977	242.581	699	715	1209
1073	3408	3429	243.618	0	130	1194
1074	3732	3754	244.657	935	813	1246
1075	2436	2446	245.728	0	964	1179
1076	2707	2726	246.800	782	966	1141
1077	3516	3555	247.889	879	848	1197
1078	3699	3739	248.985	420	0	1162
1079	3532	3680	250.086	746	1041	1188
1080	2677	3707	251.201	831	597	1227

1081	2699	2741	252.320	0	0	1187
1082	3716	3727	253.442	1008	873	1247
1083	3074	3142	254.566	961	200	1193
1084	2698	2706	255.691	986	855	1212
1085	3302	3319	256.844	940	629	1224
1086	2963	3035	258.001	876	288	1206
1087	3367	3455	259.160	671	0	1144
1088	3182	3217	260.323	976	620	1230
1089	3345	3374	261.493	948	779	1171
1090	3458	3462	262.664	985	666	1261
1091	2620	3332	263.837	905	883	1129
1092	2680	2688	265.015	805	0	1218
1093	2475	2501	266.194	841	1039	1165
1094	2900	3487	267.374	774	1045	1182
1095	2494	2843	268.556	979	757	1225
1096	2466	2474	269.742	999	817	1131
1097	2700	2704	270.939	981	921	1191
1098	2753	2764	272.136	915	728	1192
1099	3007	3034	273.333	944	844	1241
1100	3248	3314	274.545	937	0	1242
1101	3040	3679	275.759	907	784	1261
1102	2887	2995	276.975	1051	618	1199
1103	2597	2622	278.196	862	927	1216
1104	2528	2851	279.418	1000	801	1220
1105	3341	3577	280.643	684	980	1219
1106	3518	3519	281.873	821	767	1215
1107	3206	3278	283.134	745	1032	1132
1108	2483	2495	284.395	899	696	1153
1109	2552	2600	285.665	1033	888	1183
1110	2602	2885	286.971	1053	546	1184
1111	3601	3641	288.282	996	828	1176
1112	2679	3039	289.615	955	1013	1178
1113	2713	2768	290.959	0	919	1152
1114	2693	3463	292.320	0	1009	1214
1115	2721	3047	293.682	1037	578	1236
1116	2500	2531	295.044	749	644	1164
1117	2428	2429	296.442	0	0	1244
1118	2702	2717	297.848	902	772	1192
1119	2763	2774	299.272	595	872	1180
1120	2612	2663	300.710	858	914	1205
1121	3478	3482	302.153	1002	1018	1240
1122	2567	3211	303.603	971	731	1200
1123	3695	3740	305.078	0	983	1239
1124	2438	2439	306.559	1038	1027	1154
1125	3201	3388	308.045	640	0	1204
1126	2568	2932	309.545	987	936	1222
1127	2784	2822	311.072	849	838	1166
1128	3757	3764	312.599	0	0	1247
1129	2620	2681	314.140	1091	787	1235
1130	2838	2890	315.702	1062	896	1248
1131	2466	2573	317.286	1096	771	1217
1132	3206	3243	318.872	1107	886	1224
1133	2751	2844	320.503	0	956	1163
1134	2541	2579	322.141	931	1023	1183
1135	3468	3483	323.807	1052	0	1221
1136	2794	3075	325.482	959	810	1203
1137	3521	3565	327.161	860	984	1234

1138	2448	2462	328.861	0	1026	1231
1139	3147	3245	330.561	721	974	1257
1140	2548	2606	332.262	0	1040	1256
1141	2454	2707	333.970	995	1076	1254
1142	2527	2650	335.689	884	566	1186
1143	3503	3656	337.427	0	0	1239
1144	3247	3367	339.212	960	1087	1175
1145	2786	2905	341.017	998	1014	1209
1146	2490	2525	342.833	1011	1020	1222
1147	3536	3541	344.651	991	0	1250
1148	3106	3160	346.473	1050	857	1230
1149	2778	2840	348.295	898	952	1237
1150	3173	3570	350.118	885	742	1197
1151	3110	3174	351.942	0	954	1232
1152	2713	2967	353.768	1113	0	1210
1153	2473	2483	355.613	799	1108	1174
1154	2438	2453	357.464	1124	835	1267
1155	3270	3378	359.322	697	1058	1253
1156	2937	2944	361.216	822	988	1243
1157	2724	2744	363.123	967	763	1187
1158	3067	3144	365.040	1067	791	1283
1159	2728	2767	366.964	992	970	1254
1160	3434	3682	368.897	947	972	1251
1161	2683	2692	370.840	1043	880	1252
1162	2668	3699	372.786	926	1078	1252
1163	2751	2962	374.766	1133	0	1275
1164	2491	2500	376.775	909	1116	1263
1165	2475	2709	378.787	1093	0	1225
1166	2784	2863	380.813	1127	1065	1286
1167	3688	3736	382.841	889	630	1226
1168	2433	2437	384.878	861	1024	1262
1169	2431	2441	386.962	1057	0	1244
1170	3043	3465	389.121	0	769	1291
1171	3345	3446	391.284	1089	653	1245
1172	2530	2635	393.451	910	1004	1189
1173	3031	3042	395.642	982	0	1218
1174	2469	2473	397.874	830	1153	1273
1175	3247	3407	400.119	1144	900	1290
1176	3601	3629	402.404	1111	887	1258
1177	2443	2485	404.699	1044	1029	1231
1178	2674	2679	407.012	906	1112	1291
1179	2436	2716	409.352	1075	890	1262
1180	2727	2763	411.698	975	1119	1237
1181	2898	3137	414.112	916	942	1264
1182	2900	3480	416.526	1094	908	1278
1183	2541	2552	418.944	1134	1109	1207
1184	2602	2810	421.439	1110	807	1274
1185	3036	3352	423.966	1059	923	1245
1186	2527	2585	426.541	1142	1035	1249
1187	2699	2724	429.137	1081	1157	1233
1188	3525	3532	431.759	938	1079	1276
1189	2530	2624	434.433	1172	950	1274
1190	2514	2554	437.150	863	1007	1256
1191	2697	2700	439.909	0	1097	1268
1192	2702	2753	442.682	1118	1098	1267
1193	3066	3074	445.455	1042	1083	1292
1194	3168	3408	448.231	965	1073	1257

1195	3419	3568	451.013	901	1054	1280
1196	3666	3685	453.891	969	1060	1238
1197	3173	3516	456.771	1150	1077	1255
1198	2906	3009	459.679	820	1055	1248
1199	2887	2894	462.614	1102	1034	1243
1200	2567	3528	465.601	1122	1010	1270
1201	2959	3226	468.606	1015	913	1272
1202	3077	3121	471.632	826	962	1232
1203	2794	3071	474.671	1136	1064	1260
1204	3199	3201	477.769	1017	1125	1289
1205	2612	2653	480.882	1120	878	1266
1206	2963	2983	484.061	1086	1046	1234
1207	2482	2541	487.240	1003	1183	1297
1208	3108	3129	490.421	1001	968	1270
1209	2786	2883	493.602	1145	1072	1278
1210	2713	3004	496.785	1152	0	1275
1211	2464	2508	500.009	853	1047	1263
1212	2430	2698	503.235	864	1084	1259
1213	3223	3267	506.485	1056	990	1272
1214	2693	3452	509.752	1114	1019	1287
1215	3518	3593	513.052	1106	1048	1258
1216	2597	2865	516.441	1103	918	1229
1217	2466	2492	520.010	1131	1006	1297
1218	2680	3031	523.772	1092	1173	1294
1219	3341	3691	527.549	1105	808	1255
1220	2528	2553	531.412	1104	892	1260
1221	3468	3470	535.314	1135	894	1277
1222	2490	2568	539.232	1146	1126	1301
1223	3722	3747	543.277	1012	825	1238
1224	3206	3302	547.363	1132	1085	1264
1225	2475	2494	551.572	1165	1095	1305
1226	3688	3752	555.964	1167	994	1246
1227	2662	2677	560.409	1031	1080	1300
1228	3255	3386	565.049	1066	1049	1269
1229	2515	2597	569.710	1063	1216	1301
1230	3106	3182	574.376	1148	1088	1286
1231	2443	2448	579.054	1177	1138	1284
1232	3077	3110	583.765	1202	1151	1242
1233	2699	2701	588.484	1187	1025	1268
1234	2963	3521	593.245	1206	1137	1298
1235	2620	2672	598.182	1129	1005	1266
1236	2721	3050	603.123	1115	1021	1304
1237	2727	2778	608.087	1180	1149	1296
1238	3666	3722	613.126	1196	1223	1298
1239	3503	3695	618.219	1143	1123	1299
1240	3478	3594	623.347	1121	877	1277
1241	3006	3007	628.540	993	1099	1279
1242	3077	3248	633.869	1232	1100	1283
1243	2887	2937	639.210	1199	1156	1279
1244	2428	2431	644.732	1117	1169	1285
1245	3036	3345	650.268	1185	1171	1282
1246	3688	3732	655.838	1226	1074	1308
1247	3716	3757	661.496	1082	1128	1271
1248	2838	2906	667.222	1130	1198	1265
1249	2489	2527	673.050	1069	1186	1306
1250	3536	3595	679.162	1147	0	1299
1251	3321	3434	685.370	1061	1160	1287

1252	2668	2683	691.600	1162	1161	1281
1253	3089	3270	698.178	1030	1155	1302
1254	2454	2728	705.010	1141	1159	1303
1255	3173	3341	711.934	1197	1219	1289
1256	2514	2548	718.900	1190	1140	1295
1257	3147	3168	726.000	1139	1194	1269
1258	3518	3601	733.105	1215	1176	1311
1259	2430	2807	740.261	1212	1036	1284
1260	2528	2794	747.496	1220	1203	1309
1261	3040	3458	754.809	1101	1090	1282
1262	2433	2436	762.136	1168	1179	1273
1263	2464	2491	769.747	1211	1164	1293
1264	2898	3206	777.398	1181	1224	1290
1265	2838	2998	785.303	1248	1071	1312
1266	2612	2620	793.598	1205	1235	1280
1267	2438	2702	802.520	1154	1192	1293
1268	2697	2699	811.543	1191	1233	1296
1269	3147	3255	820.652	1257	1228	1317
1270	2567	3108	829.938	1200	1208	1292
1271	3716	3731	839.387	1247	1068	1276
1272	2959	3223	849.905	1201	1213	1288
1273	2433	2469	860.453	1262	1174	1305
1274	2530	2602	871.016	1189	1184	1294
1275	2713	2751	881.836	1210	1163	1310
1276	3525	3716	893.166	1188	1271	1318
1277	3468	3478	904.549	1221	1240	1313
1278	2786	2900	915.947	1209	1182	1304
1279	2887	3006	927.439	1243	1241	1312
1280	2612	3419	939.177	1266	1195	1316
1281	2668	3520	951.147	1252	1028	1295
1282	3036	3040	963.296	1245	1261	1307
1283	3067	3077	975.492	1158	1242	1302
1284	2430	2443	988.482	1259	1231	1324
1285	2428	2434	1001.574	1244	1070	1315
1286	2784	3106	1014.790	1166	1230	1288
1287	2693	3321	1029.057	1214	1251	1308
1288	2784	2959	1043.405	1286	1272	1309
1289	3173	3199	1058.648	1255	1204	1314
1290	2898	3247	1074.703	1264	1175	1319
1291	2674	3043	1091.048	1178	1170	1307
1292	2567	3066	1108.743	1270	1193	1314
1293	2438	2464	1126.710	1267	1263	1322
1294	2530	2680	1144.957	1274	1218	1320
1295	2514	2668	1163.621	1256	1281	1328
1296	2697	2727	1183.358	1268	1237	1310
1297	2466	2482	1203.205	1217	1207	1300
1298	2963	3666	1223.789	1234	1238	1311
1299	3503	3536	1245.993	1239	1250	1313
1300	2466	2662	1269.041	1297	1227	1306
1301	2490	2515	1292.157	1222	1229	1303
1302	3067	3089	1318.743	1283	1253	1317
1303	2454	2490	1345.539	1254	1301	1322
1304	2721	2786	1373.820	1236	1278	1323
1305	2433	2475	1405.314	1273	1225	1315
1306	2466	2489	1436.918	1300	1249	1320
1307	2674	3036	1469.185	1291	1282	1319
1308	2693	3688	1503.139	1287	1246	1316

1309	2528	2784	1537.374	1260	1288	1329
1310	2697	2713	1571.764	1296	1275	1321
1311	2963	3518	1608.133	1298	1258	1330
1312	2838	2887	1647.649	1265	1279	1325
1313	3468	3503	1688.980	1277	1299	1318
1314	2567	3173	1730.442	1292	1289	1323
1315	2428	2433	1772.956	1285	1305	1327
1316	2612	2693	1818.317	1280	1308	1326
1317	3067	3147	1864.487	1302	1269	1329
1318	3468	3525	1910.762	1313	1276	1330
1319	2674	2898	1965.360	1307	1290	1326
1320	2466	2530	2029.369	1306	1294	1328
1321	2697	2893	2093.892	1310	0	1325
1322	2438	2454	2158.978	1293	1303	1324
1323	2567	2721	2226.586	1314	1304	1331
1324	2430	2438	2310.630	1284	1322	1327
1325	2697	2838	2399.922	1321	1312	1333
1326	2612	2674	2493.593	1316	1319	1334
1327	2428	2430	2594.528	1315	1324	1332
1328	2466	2514	2704.265	1320	1295	1332
1329	2528	3067	2817.080	1309	1317	1331
1330	2963	3468	2931.734	1311	1318	1335
1331	2528	2567	3084.464	1329	1323	1333
1332	2428	2466	3347.173	1327	1328	1336
1333	2528	2697	3683.089	1331	1325	1334
1334	2528	2612	4065.947	1333	1326	1335
1335	2528	2963	4548.421	1334	1330	1336
1336	2428	2528	5344.000	1332	1335	0