OPTIMIZATION MODEL FOR ASSIGNING STUDENTS TO THE RESIDENTIAL HALLS IN UUM

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Abstract: This research is about students enrolled to the residential halls at University Utara Malaysia (UUM). Each of the students are assigned to each residential hall by Students Accommodation Centre (SAC). In this study, we are focusing on 15 residential halls that UUM provided to all students. This research using quantitative methods for collecting of information through the questionnaires to choose which residential hall that students preferred to stay at UUM. This study involved 50 UUM students as the respondents. By applying mathematical programming, we are helping the administrators with the assignment process. As a result, we have established the accurate decision by using A Mathematical Programming Language (AMPL) software. The simple AMPL programming was used to solve the practical application by using some mathematical model to find an optimum solution. Moreover, this research aims to complete the residential hall placement of the students by the assignment problem by using mathematical programming method. The findings of the study will be used to increase knowledge on the issue of the appropriate residential hall placement for students.

Keywords: Assignment problem, residential hall, optimization, AMPL programming

1. INTRODUCTION

Students Accommodation Centre (SAC) staff are facing the problem of assigning every incoming new students for every intake to the residential hall. In this research, we studied on the 15 residential halls provided by University Utara Malaysia (UUM) for each student. Thus, we have chosen 50 students randomly for helping us to evaluate their choices, based on their preferences. We have established the accurate decision by using the mathematical programming that called A Mathematical Programming Language (AMPL). The simple AMPL programming was used to solve the practical application by using some mathematical model to find an optimum solution. The programming consists of developing a model, with the objectives, variables, and constraints that represent by the general form of the problem to be solved (Fourer, Gay, & Kernighan, 2003). To run the model, data that specify the problem should be collected in advance. Generating the objective functions and constraints of the model can be solved based on the data obtained. Lastly, find the optimal solution and display the final results.

2. METHODOLOGY

To achieve the objectives, we use this mathematical flow model to solve the assignment problem as shown in Figure 1 below.

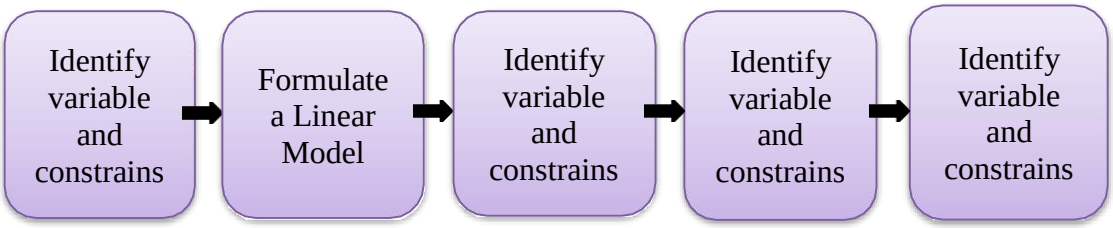

Figure 1
Mathematical flow model

3. RESULT AND DISCUSSION

Table 1 shows the result of assignment to each student. For example, student A21 are assigned to the Malaysia Airlines (MAS) residential hall. To validate this result, it showed that student A21 was assigned to the residential based on their first choice.

Table 1
Result of the assignment problem

Residential Hall	Students and Number of Preferences			
MAS	A21 (1)	A28 (1)	A44 (1)	A47 (1)
TNB	A10 (1)	A18 (1)	A37 (1)	A43 (1)
PROTON	A02 (1)	A42 (1)		
TRADEWINDS	A29 (1)	A30 (2)	A35 (1)	A36 (2)
PETRONAS	A01 (1)	A05 (1)	A24 (1)	A46 (1)
GRANTT	A06 (1)	A13 (2)	A16 (2)	A17 (1)
SIME DARBY	A03 (1)	A39 (1)	A49 (2)	
MISC	A12 (1)	A20 (1)	A32 (1)	A50 (1)
TM	A23 (1)	A27 (1)		
BSN	A07 (1)	A14 (1)	A34 (1)	A45 (1)
YAB	A09 (1)	A26 (1)	A41 (1)	A48 (1)
MUAMALAT	A19 (1)	A31 (2)	A33 (1)	
MAYBANK	A11 (2)	A25 (1)	A40 (2)	
SME	A08 (1)			
BANK RAKYAT	A04 (1)	A15 (1)	A22 (1)	A38 (1)

4. CONCLUSION

In this research, it showed that how a mathematical model is used to assign students to the residential hall. Residential hall placement problem is a problem that often occurs (Jennifer, 2011) to the Students Accommodation Centre (SAC) in UUM. For this research, we only focus on the UUM students who can serve as a guide and method to solve the problem of residential hall placement of students using a mathematical model programming. We used AMPL programming that gives accurate results and is easy to be understood and analysed by the user. This research can be applied to the real case situation at UUM residential hall placement problems by using a mathematical model programming that provide a reliable result and systematic solution compared with others model of solution. SAC can have the benefit from the proposed approach for the residential placement of students in order to ensure optimum results. Therefore, we recommend that the model could be adopted by SAC for student residential hall placement that comprises more complex situation. For further research approach, new research can be adapted the existing model and solution to application problems, including a large set of students and some critical constraints.

5. REFERENCES

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