7X7 COMPUTER-GENERATED WORD SQUARES

M. D. McILROY
Bernardsville, New Jersey

A computer search for seven-letter word squares that can be made from words in Webster's Collegiate Dictionary, 7th edition, turned up only 52 examples. Specifically, these were constructed from a corpus of 9663 seven-letter words: single words listed in boldface type in the main body of the dictionary (including proper names), and names from the appendices of boys' and girls' first names. Had this corpus been expanded to include inferred words not given in boldface, such as plurals of nouns, -ING and -ED forms of verbs, and -ER and -EST forms of adjectives, many more squares would have been found, including at least four of the eight 7x7 word squares presented by Dmitri Borgmann at the start of Chapter 7 in Language on Vacation (Scribner's, 1965).

The computer-generated list of squares demonstrates that symmetric squares (ones in which the words in the rows are identically repeated in the columns) are far more common than nonsymmetric ones. Only one square was nonsymmetric, and it failed by just one letter.

Many of the squares occur in clusters that differ in only a few letters. To save space in the tabulation, these are displayed as one basic square with the substitutable letters pointed out below. For example, the square at the right represents the cluster of squares given at the bottom of the page (the first of these 3 squares is the sole nonsymmetric square alluded to above). The remaining 49 squares are given in 30 clusters on the following two pages. The number in parentheses denotes the number of squares summarized by the cluster.

```
C E L E S T A
E X A * T E R
L A W L E S S
E # L I P S E
S T E P H E N
T E S S E R A
A R S E N A L

* = C, L      (3)
# = C, L
```

```
C E L E S T A     C E L E S T A     C E L E S T A
E X A L T E R     E X A C T E R     E X A L T E R
L A W L E S S     L A W L E S S     L A W L E S S
E C L I P S E     E C L I P S E     E L L I P S E
S T E P H E N     S T E P H E N     S T E P H E N
T E S S E R A     T E S S E R A     T E S S E R A
A R S E N A L     A R S E N A L     A R S E N A L
```

A sampling of 3x3 squares suggests that there are hundreds of thousands, and 4x4 squares number far into the millions. The number of 6x6 squares is estimated at a few tens of thousands; the cutoff at 7 is remarkably abrupt.

```
*  R  E  S  T  L  E
R  E  N  E  W  A  L
E  N  P  L  A  N  E
S  E  L  F  D  O  M
T  W  A  D  D  L  E
L  A  N  O  L  I  N
E  L  E  M  E  N  T

* = T, W    (2)
```

```
*  E  S  T  I  V  E
E  T  H  A  N  O  L
S  H  I  N  G  L  E
T  A  N  T  R  U  M
I  N  G  R  A  T  E
V  O  L  U  T  I  N
E  L  E  M  E  N  T

* = F, R    (2)
```

```
*  E  A  C  H  E  R
E  S  T  H  E  T  E
A  T  T  A  C  H  E
C  H  A  T  T  E  R
H  E  C  T  A  R  E
E  T  H  E  R  I  C
R  E  E  L  E  C  T

* = L, R, T    (3)
```

```
C  A  S  S  A  V  A
A  S  H  E  R  I  M
S  H  A  R  R  O  N
S  E  R  V  I  L  E
A  R  R  I  S  E  S
V  I  O  L  E  N  T
A  M  N  E  S  T  Y
```

```
C  A  S  T  O  F  F
A  P  P  A  R  E  L
S  P  I  C  I  L  Y
T  A  C  T  F  U  L
O  R  I  F  I  C  E
F  E  L  U  C  C  A
F  L  Y  L  E  A  F
```

```
C  A  T  A  L  P  A
A  I  R  M  A  I  L
T  R  I  P  O  L  I
A  M  P  U  T  E  E
L  A  O  T  I  A  N
P  I  L  E  A  T  E
A  L  I  E  N  E  E
```

```
C  O  N  T  E  N  D
O  V  E  R  S  E  A
N  E  G  A  T  O  N
T  R  A  C  I  N  G
E  S  T  I  V  A  L
N  E  O  N  A  T  E
D  A  N  G  L  E  R
```

```
C  O  N  T  E  N  T
O  V  E  R  S  E  A
N  E  G  A  T  O  N
T  R  A  C  I  N  G
E  S  T  I  V  A  L
N  E  O  N  A  T  E
T  A  N  G  L  E  D
```

```
D  E  R  I  V  E  R
E  R  U  D  I  T  E
R  U  P  I  A  H  S
I  D  I  O  T  I  C
V  I  A  T  I  C  A
E  T  H  I  C  A  L
R  E  S  C  A  L  E
```

```
N  O  R  T  H  E  R
O  P  E  R  O  S  E
R  E  M  O  R  S  E
T  R  O  M  M  E  L
H  O  R  M  O  N  E
E  S  S  E  N  I  C
R  E  E  L  E  C  T
```

```
J  A  C  K  L  E  G
A  T  H  L  E  T  E
C  H  E  A  T  E  R
K  L  A  N  I  S  M
L  E  T  I  T  I  A
E  T  E  S  I  A  N
G  E  R  M  A  N  E
```

```
T  O  B  A  C  C  O
O  V  E  R  A  L  L
B  E  V  E  L  E  D
A  R  E  O  L  A  S
C  A  L  L  A  N  T
C  L  E  A  N  S  E
O  L  D  S  T  E  R
```

```
B  L  E  S  S  E  D
L  *  N  E  T  T  E
E  N  T  R  E  A  T
S  E  R  #  A  T  E
S  T  E  A  R  I  N
E  T  A  T  I  S  T
D  E  T  E  N  T  E

* = U, Y    (4)
# = I, R
```

```
*  A  S  S  O  C  K
A  Z  T  E  C  A  N
S  T  Y  R  E  N  E
S  E  R  #  A  T  E
O  C  E  A  N  I  C
C  A  N  T  I  N  A
K  N  E  E  C  A  P

* = C, H    (4)
# = I, R
```

```
*  A  T  C  H  E  T
A  R  R  A  Y  E  R
T  R  #  N  D  L  E
C  A  N  T  A  L  A
H  Y  D  A  T  I  D
E  E  L  L  I  K  E
T  R  E  A  D  E  R

* = H, L, R    (6)
# = I, U
```

```
A M A S S E R        A P P O I N T        * R I S T L E
M E L K I T E        P R A N C E R        R E N E W A L
A L R I G H T        P A L E T T E        I N C L I N E
S K I N N E R        O N E N E S S        S E L F D O M
S I G N O R A        I C T E R U S        T W I D D L E
E T H E R I C        N E T S U K E        L A N O L I N
R E T R A C *        T R E S S E *        E L E M E N T

* = E, T   (2)       * = D, L   (2)       * = B, G   (2)


A P P R O V E        A S C E S I S        A T T E M P T
P U R A N I C        S T A M I N A        T U A T A R A
P R E B E N D        C A P E L I N        T A N A G E R
R A B B I T Y        E M E R I T I        E T A T I S T
O N E I D A S        S I L I C I C        M A G I C A L
V I N T A G E        I N I T I A L        P R E S A G E
E C D Y S E S        S A N I C L E        T A R T L E T


C E L E S T A        C E S S P I T        C H A S S E D
E X A C T O R        E S T U A R Y        H E C T A R E
L A B O R E D        S T E L L A R        A C H A T E S
E C O T O N E        S U L T A N A        S T A T I C S
S T R O M A L        P A L A D I N        S A T I A T E
T O E N A I L        I R A N I A N        E R E C T O R
A R D E L L E        T Y R A N N Y        D E S S E R T


E S C O L A R        F A C T I C E        F A R T H E R
S C A L E N E        A U R O R A L        A C E R O S E
C A P I T A L        C R E M A T E        R E M O R S E
O L I V I N E        T O M E N T A        T R O M M E L
L E T I T I A        I R A N I A N        H O R M O N E
A N A N I A S        C A T T A L O        E S S E N I C
R E L E A S E        E L E A N O R        R E E L E C T


* E T B A C K        V I R A G O S        W A S S A I L
E T H A N O L        I N E X A C T        A N T E N N A
T H I S T L E        R E V I L E R        S T R I N G Y
B A S T I L E        A X I L L A E        S E I Z U R E
A N T I G E N        G A L L A N T        A N N U L A R
C O L L E G E        O C E A N I C        I N G R A T E
K L E E N E X        S T R E T C H        L A Y E R E D

* = S, W   (2)
```