LAPORAN TUGAS KECIL I

PENYELESAIAN *WORD SEARCH PUZZLE* DENGAN ALGORITMA *BRUTE FORCE*

Laporan dibuat untuk memenuhi salah satu tugas mata kuliah

IF2211 Strategi Algoritma

Disusun oleh:

Hilda Carissa Widelia 13520164

PROGRAM STUDI TEKNIK INFORMATIKA

SEKOLAH TEKNIK ELEKTRO DAN INFORMATIKA

INSTITUT TEKNOLOGI BANDUNG

2022

DAFTAR ISI

Algoritma Brute Force

Dalam pengerjaan tugas kecil ini, algoritma *brute force* sangat diutamakan. Dalam program yang dibuat penulis, setelah menerima input kata yang harus dicari, penulis langsung mencari indeks dari huruf pertama kata yang dicari. Setelah menemukan indeks tersebut, dipanggil fungsi yang berfungsi untuk mencari arah, dapat dibilang fungsi ini juga yang menjadi fungsi utama untuk mencocokkan kata yang dicari dengan huruf dalam puzzle.

Memasuki fungsi ini, atau yang dalam program disebut fungsi findArah, pertama ditentukan dulu *value* dari variabel arah. Disini arah direpresentasikan dengan angka 1 hingga 8, dimana angka 1 adalah arah atas, 2 arah kanan atas, 3 arah kanan, dan seterusnya mengikuti arah jarum jam. Jika didapat bahwa ternyata huruf kedua yang ada di puzzle tidak sesuai dengan huruf kedua dari kata yang dicari, maka nilai arah ditambah 1. Sedangkan jika huruf kedua cocok, maka variabel penghitung panjang huruf akan ditambah 1. Saat nilai variabel penghitung panjang huruf tersebut sudah sama dengan panjang kata yang dicari, maka kata sudah ditemukan, dan langsung masuk ke fungsi untuk mencetak jawaban. Namun, jika semua arah sudah dicek dan masih tidak dapat ditemukan katanya, maka akan kembali ke fungsi utama dan mencari indeks lain untuk huruf pertama kata yang dicari.

Setelah kata ditemukan, akan masuk ke fungsi yang bernama printMatrixJawab, disini jawaban akan dicetak sesuai dengan arah yang sudah didapatkan sebelumnya. Untuk setiap arah, terdapat batasan yang berbeda agar kata yang dimaksud yang di print. Jika indeks yang sedang diproses tidak sesuai dengan batasan, akan diprint karakter “-”. Selama proses ini, setiap perbandingan kata dihitung dan setelah print matriks solusi, diprint juga jumlah perbandingan kata serta waktu yang dibutuhkan untuk menjalankan semua proses dari awal ini.

Setelah semua di print, program akan melanjutkan ke kata selanjutnya dan mengulang proses dari awal. Apabila sudah tidak ada kata lagi, maka akan dicetak total waktu yang dibutuhkan dari awal setelah input file hingga semua kata ditemukan. Setelah itu program selesai.

Source Program

```java
package src;
import java.io.*;
import java.util.*;
import java.nio.file.Path;
import java.nio.file.WatchEvent;

public class App{
    public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        int row=-1, col=-1;//word length counter and counter for word comparison
        int[] find = {0,0}; // 1 0 for found, counter per kata
        char[][] matrix;
        String search;
        String namaf;
        System.out.println("Welcome to Word Search Solver!\nPlease insert the puzzle file name : ");
        namaf = sc.nextLine();
        try{
            namaf = (Path.of("../test", namaf)).toString();
            File myFile = new File(namaf);
            Scanner scnn = new Scanner(myFile);
            int m = 0; //total row
            int n = 0; //total col
            String data=scnn.nextLine();
            while(data.length() != 0){
                String array[] = data.split(" ");
                n = 0;
                for (String i : array){
                    n++;
                }
                m++;
                data = scnn.nextLine();
            }
            scnn.close();
```

Gambar 1.1 Main program dan menghitung baris dan kolom puzzle

```java
            File myFile2 = new File(namaf);
            Scanner scn = new Scanner(myFile2);
            matrix = new char[m][n];
            int i = 0;
            String data1=scn.nextLine();
            while(data1.length()!=0){
                String rows = data1.replaceAll("\\s","");
                char[] array2 = rows.toCharArray();
                for (int j = 0; j < n; j++){
                    matrix[i][j] = array2[j];
                }
                i++;
                data1 = scn.nextLine();
            }
```

Gambar 1.2 Memasukkan puzzle dari file ke matrix

```
            long startAllTime = System.nanoTime();
            while(scn.hasNextLine()){
                search = scn.nextLine();
                long startTime = System.nanoTime();
                System.out.println("Sedang mencari " + search);
                find[0] = 0;
                find[1] = 0;
                // cari huruf pertama
                for(int k = 0; k < m; k++){
                    for(int l = 0; l < n; l++){
                        if (matrix[k][l] == search.charAt(0)){
                            row = k;
                            col = l;
                            find = findArah(matrix, m, n, row, col, search, find);
                            if(find[0] == 1){
                                break;
                            }else{
                                row = -1;
                                col = -1;
                            }
                        }else{
                            find[1]++;
                        }
                    }
                    if(find[0] == 1){
                        break;
                    }
                }
                long elapsedTime = System.nanoTime()-startTime;
                System.out.println("Total execution time in milis: " + elapsedTime/1000000);
            }
            scn.close();
            long finalTime = System.nanoTime()-startAllTime;
            System.out.println("Total all execution time in milis: " + finalTime/1000000);
        } catch (FileNotFoundException e){
            System.out.println("File not found");
        }
        sc.close();
```

Gambar 1.3 Mencari kata di puzzle dan setelah menemukan menuliskan total waktu eksekusi

```java
public static void printMatrixJawab(char[][] matrix, int row, int col, int arah, int n, int m, int wlength, int attCounter){
    if(arah == 1){ // atas
        for(int i = 0; i < m; i++){
            for(int j = 0; j < n; j++){
                if(j == col && (i >= row-wlength+1 && i <= row)){
                    System.out.print(matrix[i][j] + " ");
                }else{
                    System.out.print("- ");
                }
            }
            System.out.println();
        }
    }else if(arah == 2){ // kanan atas
        int wc = wlength;
        for(int i = 0; i < m; i++){
            for(int j = 0; j < n; j++){
                if((i <= row && i >= row - wlength+1) && (j >= col && j <= col+wlength) && i+j == row+col && wc>0){
                    System.out.print(matrix[i][j] + " ");
                    wc--;
                }else{
                    System.out.print("- ");
                }
            }
            System.out.println();
        }
    }else if(arah == 3){ // kanan
        for(int i = 0; i < m;i++){
            for(int j = 0; j < n;j++){
                if(i == row && (j >= col && j <= col+wlength-1)){
                    System.out.print(matrix[i][j] + " ");
                }else{
                    System.out.print("- ");
                }
            }
            System.out.println();
        }
```

Gambar 1.4 Print matrix jawaban

```
126         }else if(arah == 4){ // kanan bawah
127             int wc = 0;
128             for(int i = 0; i < m; i++){
129                 for (int j = 0; j < n; j++){
130                     if(i >= row && j >= col && i-j == row-col && wc<=wlength-1){
131                         System.out.print(matrix[i][j] + " ");
132                         wlength--;
133                     }else{
134                         System.out.print("- ");
135                     }
136                 }
137                 System.out.println();
138             }
139 
140         }else if(arah == 5){ // bawah
141             for(int i = 0; i < m; i++){
142                 for (int j = 0; j < n;j++){
143                     if(j == col && (i >= row && i <= row+wlength-1)){
144                         System.out.print(matrix[i][j] + " ");
145                     }else{
146                         System.out.print("- ");
147                     }
148                 }
149                 System.out.println();
150             }
151         }else if(arah == 6){ // kiri bawah
152             for(int i = 0; i < m; i++){
153                 for(int j = 0; j < n; j++){
154                     if(i + j == row+col && i >= row && wlength > 0 ){
155                         System.out.print(matrix[i][j] + " ");
156                         wlength--;
157                     }else{
158                         System.out.print("- ");
159                     }
160                 }
161                 System.out.println();
162             }
```

Gambar 1.5 Print matrix jawaban

```
163         }else if(arah == 7){ // kiri
164             for(int i = 0; i < m; i++){
165                 for(int j = 0; j < n; j++){
166                     if(i == row && (j >= col-wlength+1 && j <= col)){
167                         System.out.print(matrix[i][j] + " ");
168                     }else{
169                         System.out.print("- ");
170                     }
171                 }
172                 System.out.println();
173             }
174         }else if(arah == 8){ // kiri atas
175             int wc = wlength;
176             for(int i = 0; i < m; i++){
177                 for(int j = 0; j < n; j++){
178                     if(i >= row-wlength+1 && j >= col-wlength+1 && i-j == row-col && wc>0){
179                         System.out.print(matrix[i][j] + " ");
180                         wc--;
181                     }else{
182                         System.out.print("- ");
183                     }
184                 }
185                 System.out.println();
186             }
187         }
188         System.out.println("Banyak percobaan : " + attCounter);
189     }
```

Gambar 1.6 Print matrix jawaban

```java
public static int[] findArah(char[][] matrix, int m, int n, int row, int col, String search, int[] find){
    int wordlength = search.length()-1;
    if(row>-1 && col>-1){
        int wlc = 1, arah = 1, o = row, p = col;
        // o p counter buat index satu satu
        while(wlc < wordlength+1 && arah < 9){
            if(arah == 1){ //keatas
                if(row < wordlength){
                    arah++;
                }else{
                    o--;
                    if(matrix[o][p]==search.charAt(wlc)){
                        wlc++;
                    }else{
                        wlc = 1;
                        arah++;
                        o = row;
                        p = col;
                    }
                }
                find[1]++;
            }else if(arah == 2){ //ke kanan atas
                if(n-col < wordlength | row < wordlength){
                    arah++;
                }else{
                    o--;
                    p++;
                    if(matrix[o][p]==search.charAt(wlc)){
                        wlc++;
                    }else{
                        wlc = 1;
                        arah++;
                        o = row;
                        p = col;
                    }
                }
                find[1]++;
```

Gambar 1.7 Fungsi mencocokkan kata

```java
            }else if(arah == 3){ //ke kanan
                if(n-col < wordlength){
                    arah++;
                }else{
                    p++;
                    if(matrix[o][p]==search.charAt(wlc)){
                        wlc++;
                    }else{
                        wlc = 1;
                        arah++;
                        o = row;
                        p = col;
                    }
                }
                find[1]++;
            }else if(arah == 4){ // kanan bawah
                if(n-col < wordlength | m-row < wordlength){
                    arah++;
                }else{
                    o++;
                    p++;
                    if(matrix[o][p]==search.charAt(wlc)){
                        wlc++;
                    }else{
                        wlc = 1;
                        arah++;
                        o = row;
                        p = col;
                    }
                }
                find[1]++;
```

Gambar 1.8 Fungsi mencocokkan kata

```
259                 }else if(arah == 5){ // bawah
260                     if(m-row < wordlength){
261                         arah++;
262                     }else{
263                         o++;
264                         if(matrix[o][p]==search.charAt(wlc)){
265                             wlc++;
266                         }else{
267                             wlc = 1;
268                             arah++;
269                             o = row;
270                             p = col;
271                         }
272                     }
273                     find[1]++;
274                 }else if(arah == 6){ // bawah kiri
275                     if(m-row < wordlength | col < wordlength){
276                         arah++;
277                     }else{
278                         o++;
279                         p--;
280                         if(matrix[o][p]==search.charAt(wlc)){
281                             wlc++;
282                         }else{
283                             wlc = 1;
284                             arah++;
285                             o = row;
286                             p = col;
287                         }
288                     }
289                     find[1]++;
```

Gambar 1.9 Fungsi mencocokkan kata

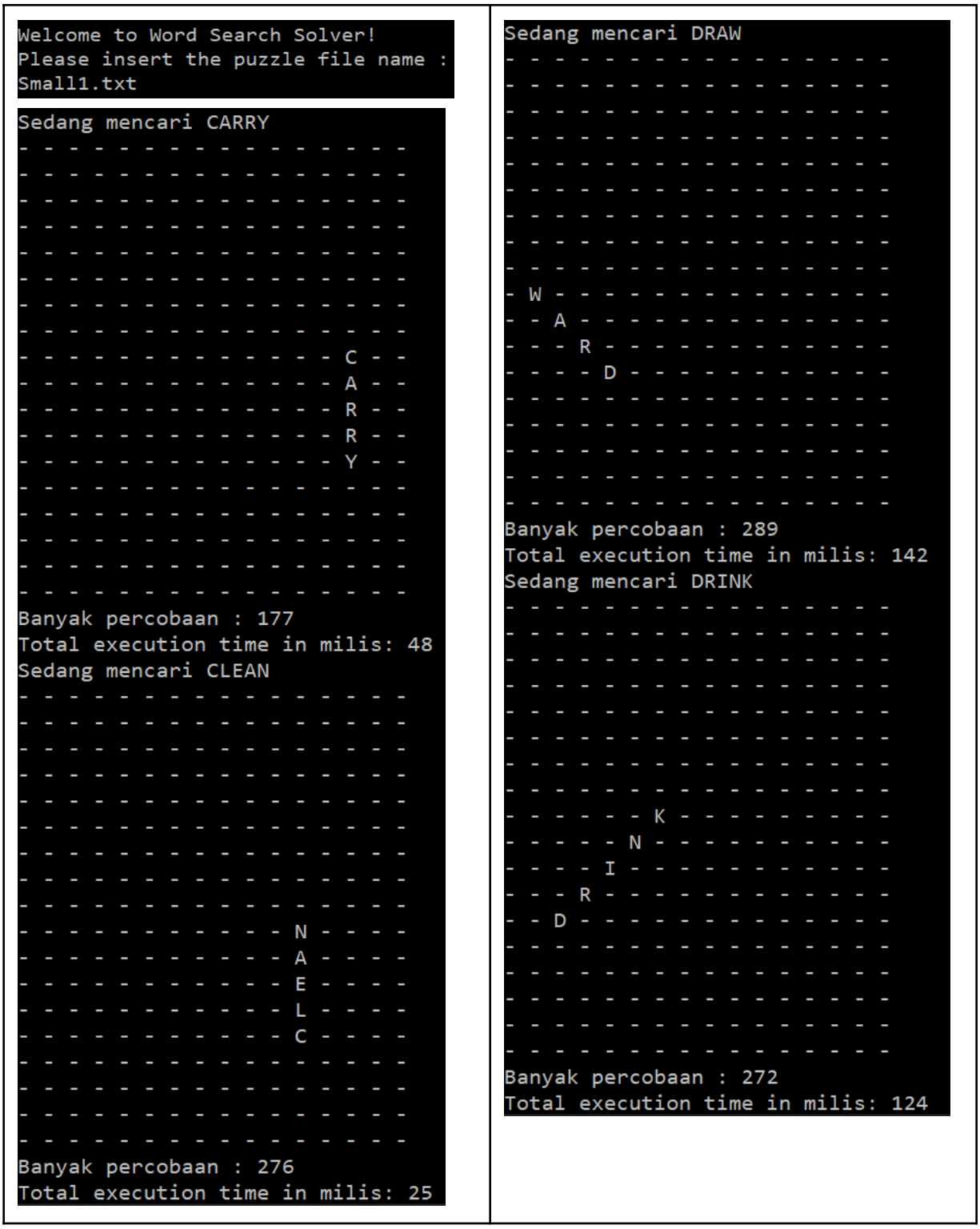
```
290                 }else if(arah == 7){ // kiri
291                     if(col < wordlength){
292                         arah++;
293                     }else{
294                         p--;
295                         if(matrix[o][p]==search.charAt(wlc)){
296                             wlc++;
297                         }else{
298                             wlc = 1;
299                             arah++;
300                             o = row;
301                             p = col;
302                         }
303                     }
304                     find[1]++;
305                 }else if(arah == 8){ // kiri atas
306                     if(col < wordlength | row < wordlength){
307                         arah++;
308                     }else{
309                         p--;
310                         o--;
311                         if(matrix[o][p]==search.charAt(wlc)){
312                             wlc++;
313                         }else{
314                             wlc = 1;
315                             arah++;
316                             o = row;
317                             p = col;
318                         }
319                     }
320                     find[1]++;
321                 }
```

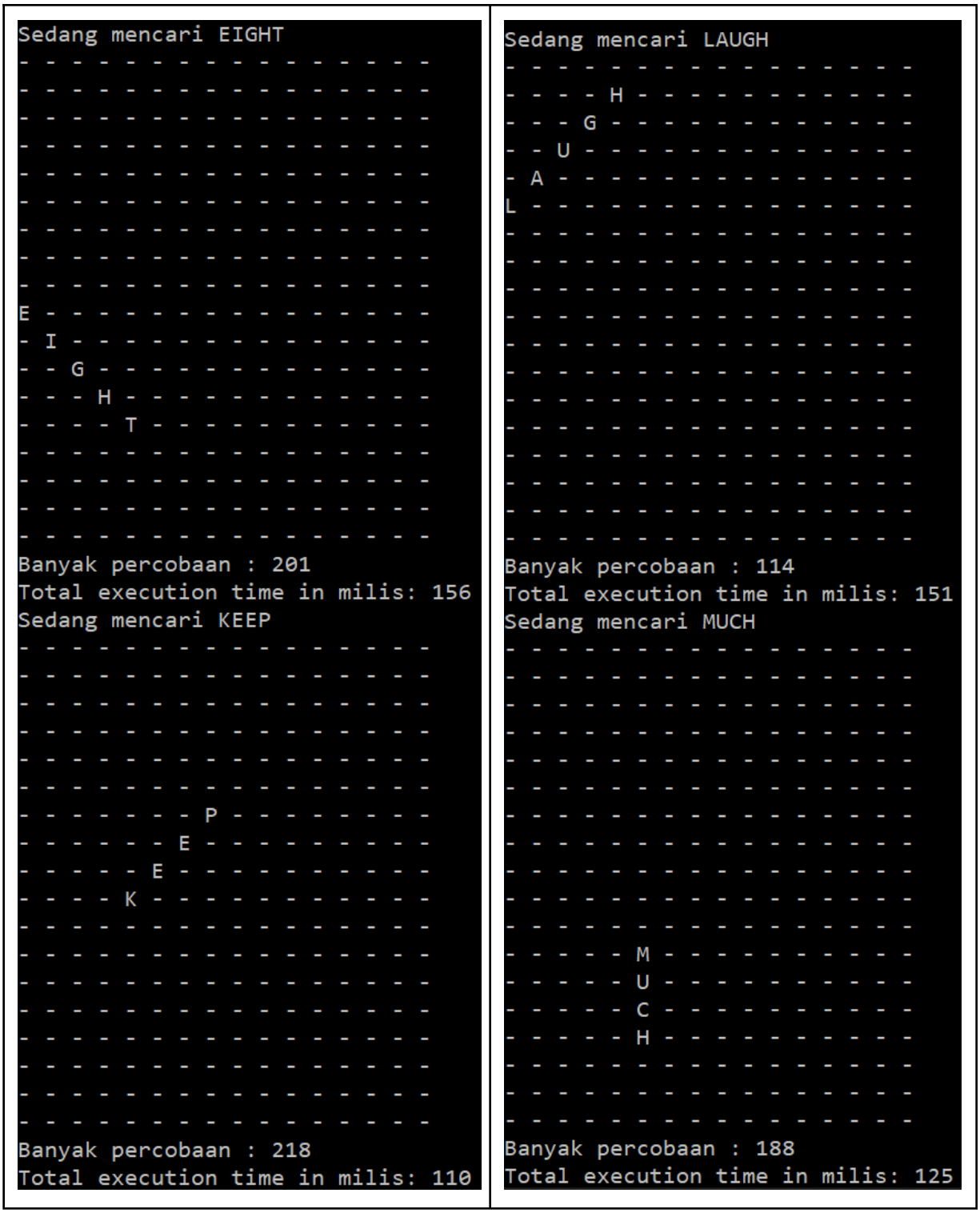
Gambar 1.10 Fungsi mencocokkan kata

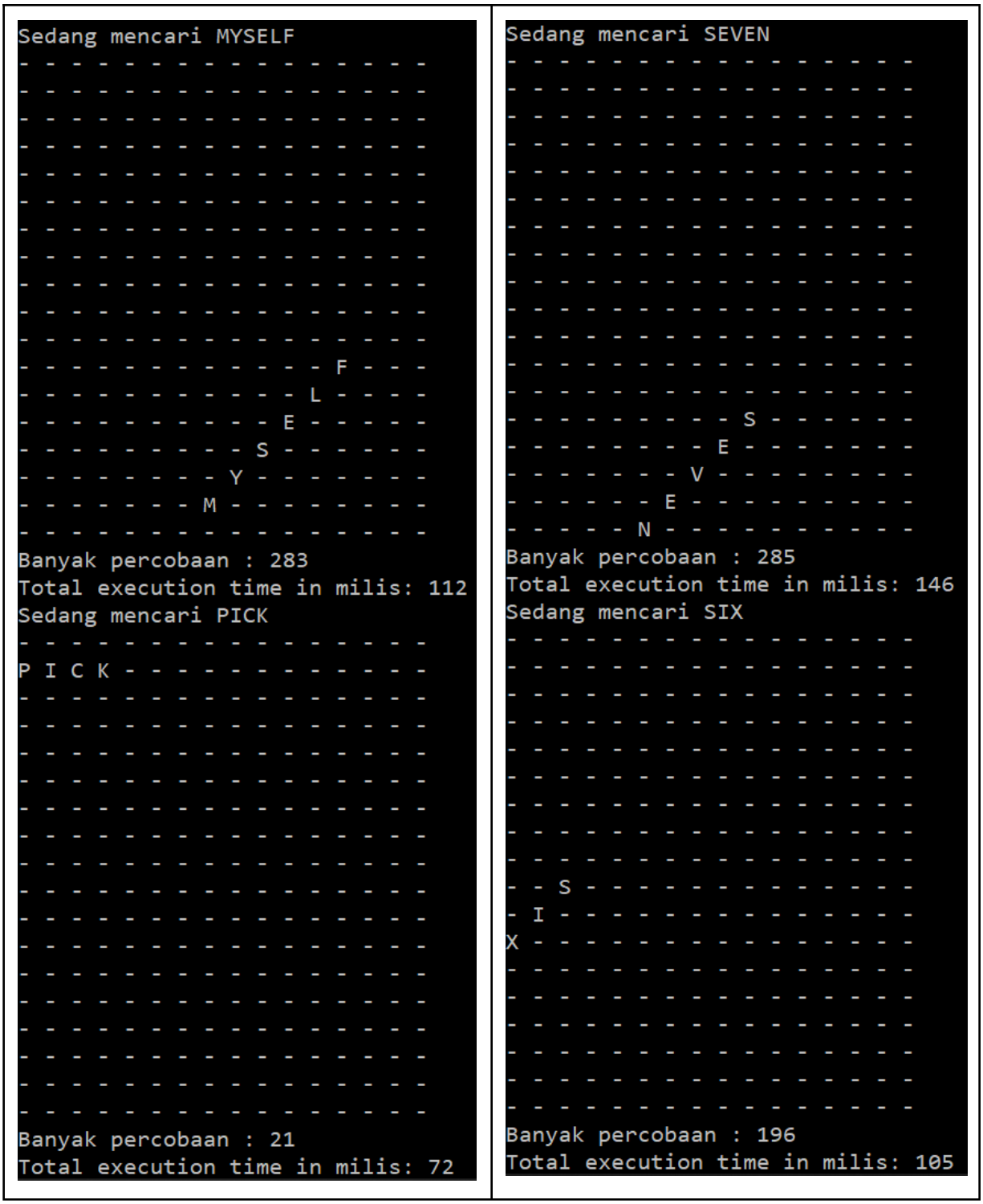
```
322             }
323             if(arah > 8){
324                 find[0] = 0;
325             }else{
326                 printMatrixJawab(matrix, row, col, arah, n, m, search.length(), find[1]);
327                 find[0] = 1;
328             }
329         }
330         return find;
331     }
332 }
```

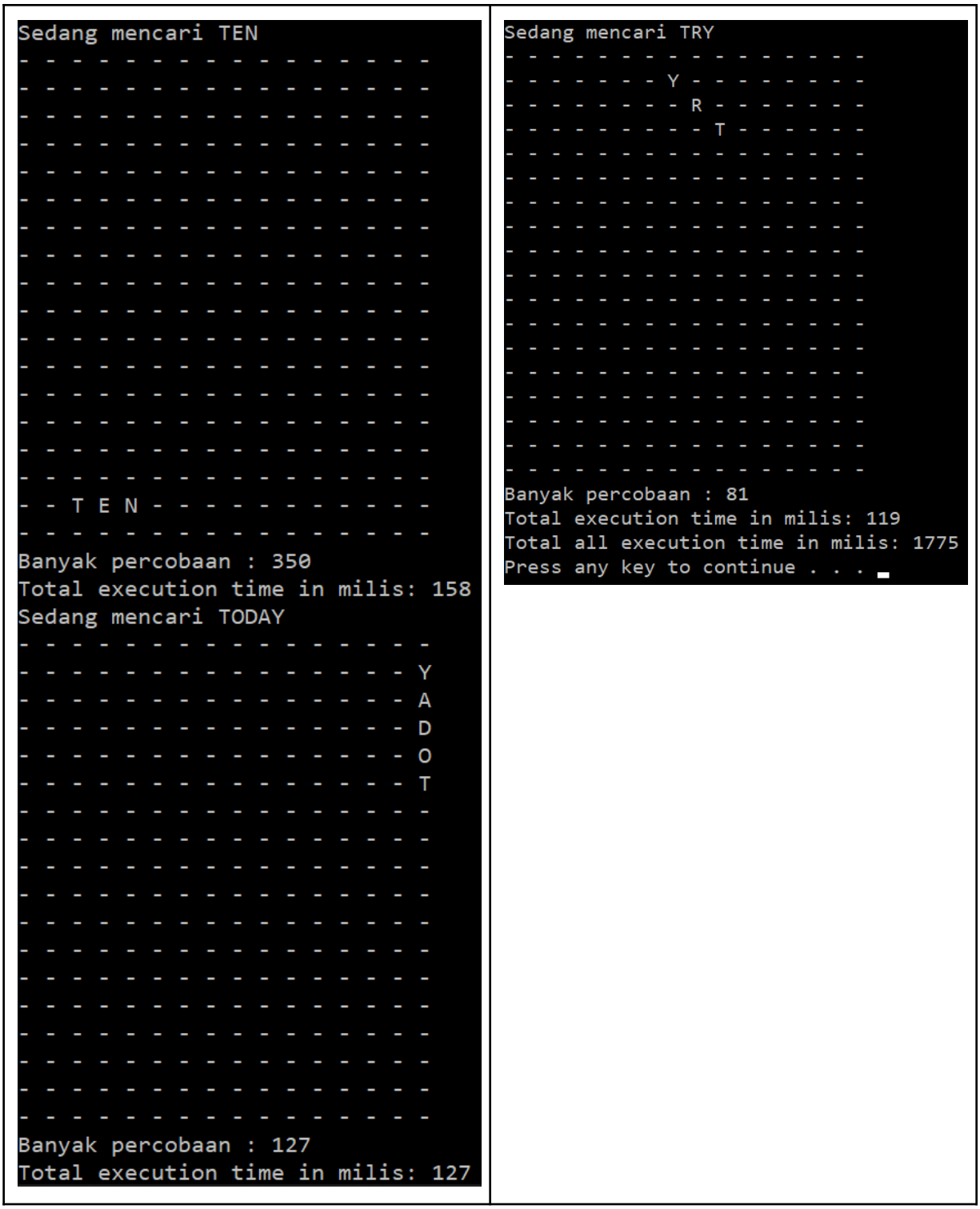
Gambar 1.11 Mencetak matrix jika kata ditemukan

Screenshot Input dan Output

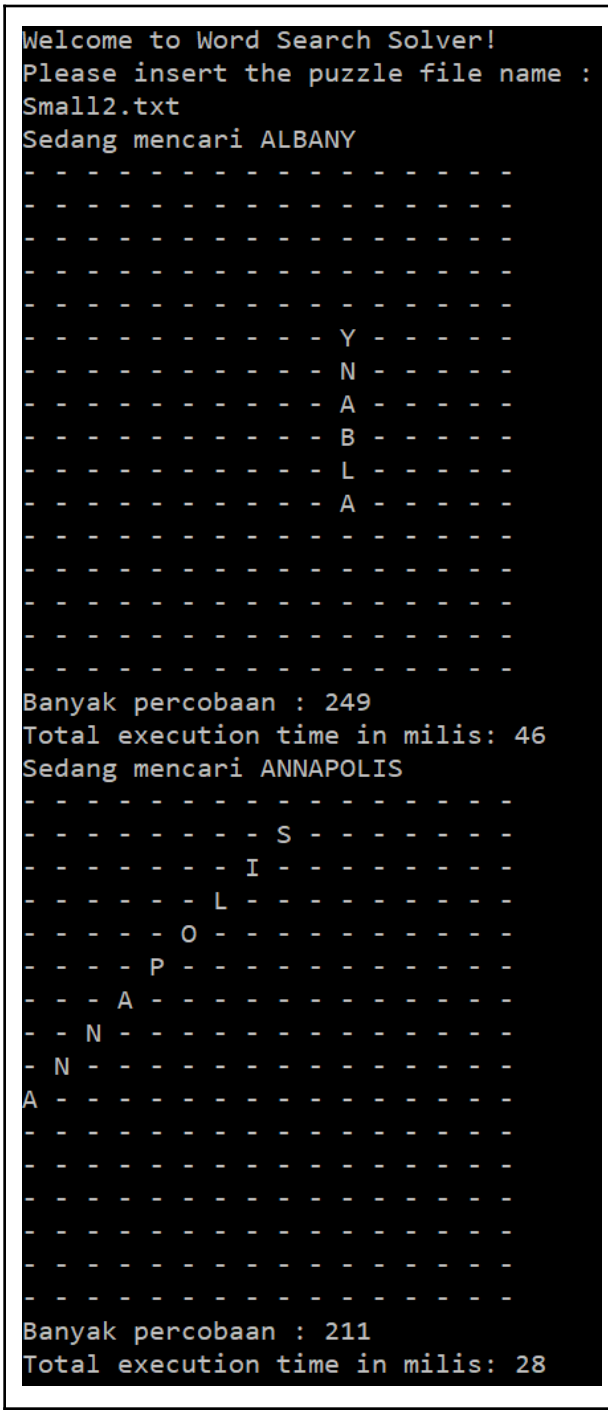


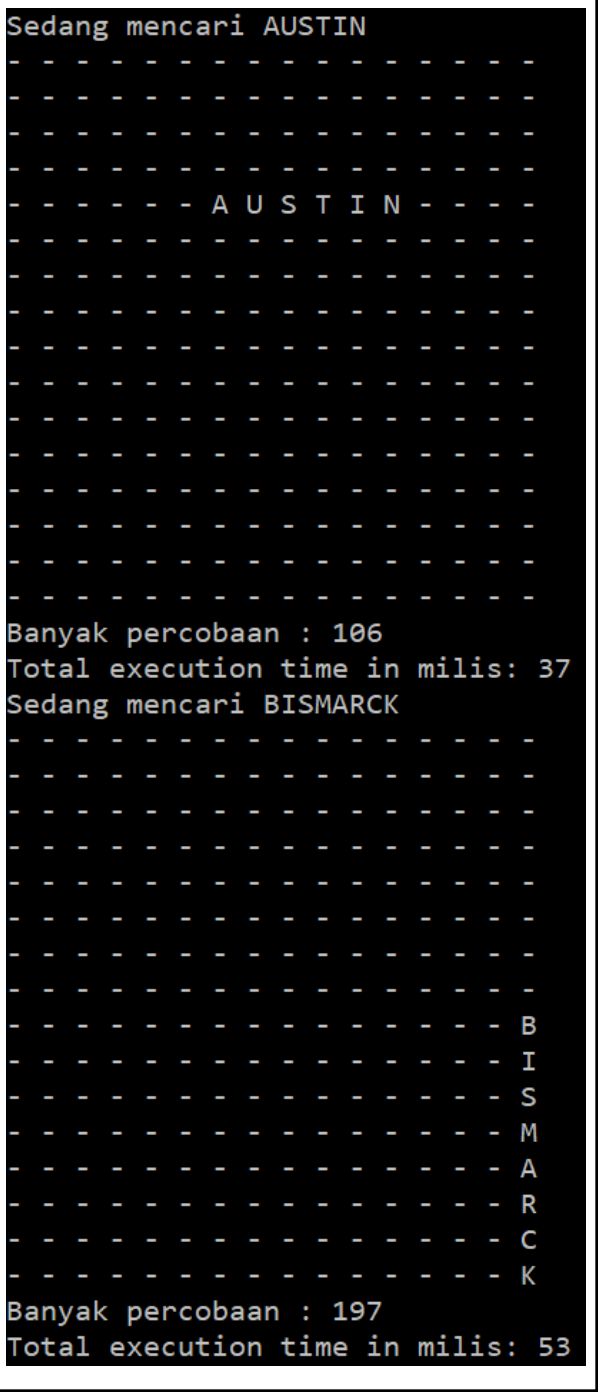

Sedang mencari EIGHT
Banyak percobaan : 201
Total execution time in milis: 156
Sedang mencari KEEP
Banyak percobaan : 218
Total execution time in milis: 110
Sedang mencari LAUGH
Banyak percobaan : 114
Total execution time in milis: 151
Sedang mencari MUCH
Banyak percobaan : 188
Total execution time in milis: 125


Sedang mencari MYSELF
Banyak percobaan : 283
Total execution time in milis: 112
Sedang mencari PICK
P I C K
Banyak percobaan : 21
Total execution time in milis: 72
Sedang mencari SEVEN
Banyak percobaan : 285
Total execution time in milis: 146
Sedang mencari SIX
Banyak percobaan : 196
Total execution time in milis: 105



Gambar 2.1 Input dan Output Test Case Small 1

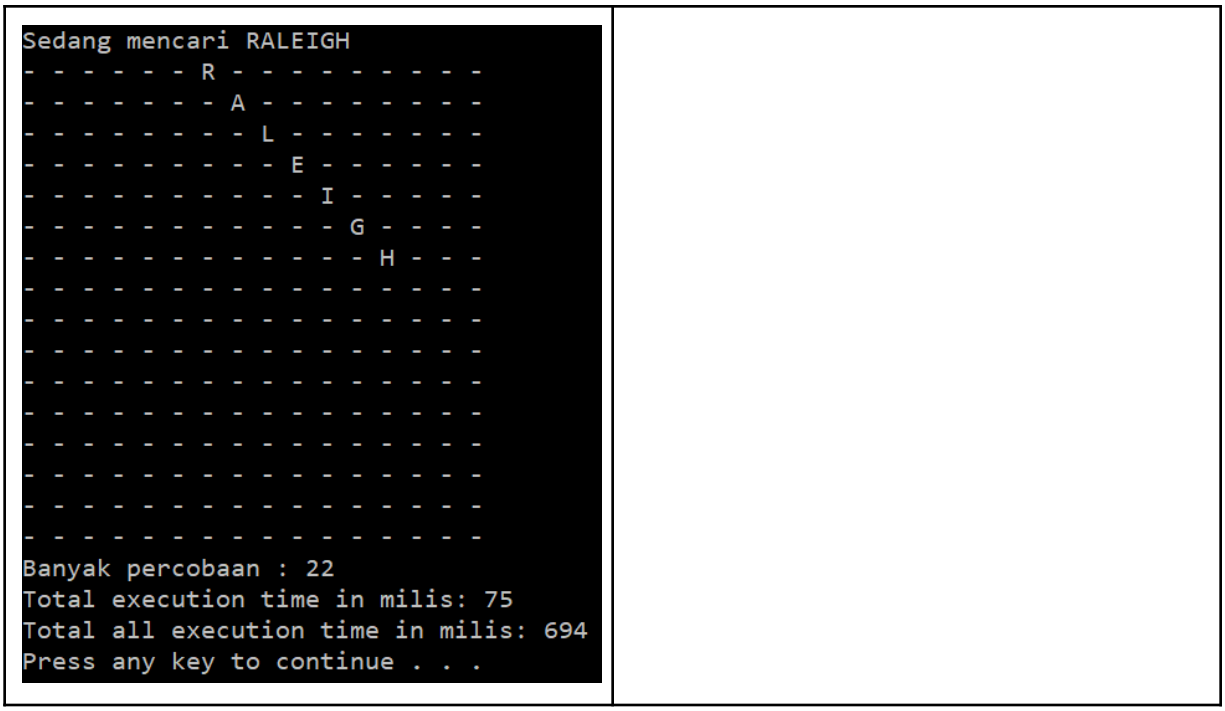

Welcome to Word Search Solver!
Please insert the puzzle file name :
Small2.txt
Sedang mencari ALBANY
Banyak percobaan : 249
Total execution time in milis: 46
Sedang mencari ANNAPOLIS
Banyak percobaan : 211
Total execution time in milis: 28


Sedang mencari AUSTIN
Banyak percobaan : 106
Total execution time in milis: 37
Sedang mencari BISMARCK
Banyak percobaan : 197
Total execution time in milis: 53

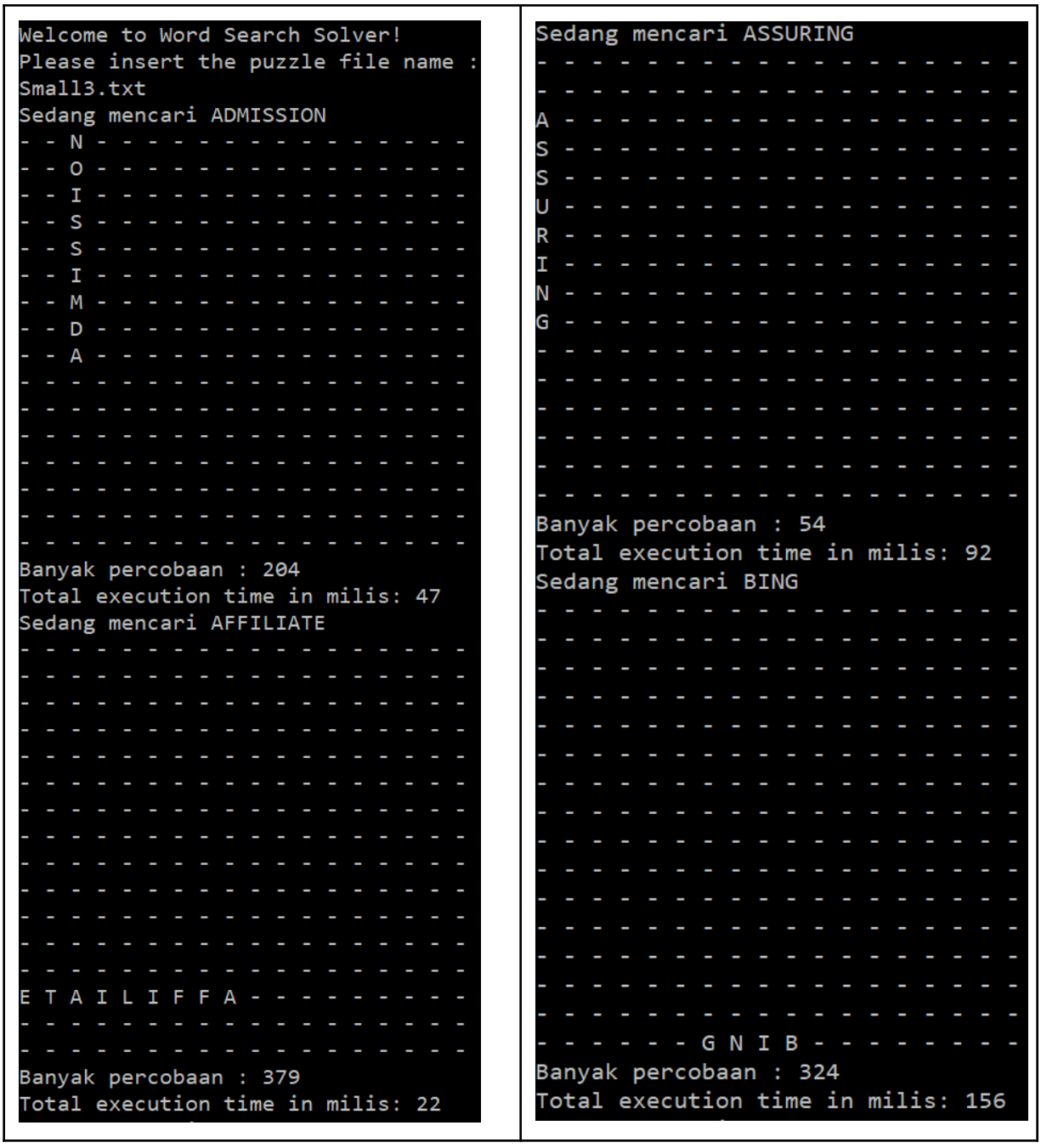

Sedang mencari BOSTON
Banyak percobaan : 15
Total execution time in milis: 43
Sedang mencari CHARLESTON
Banyak percobaan : 176
Total execution time in milis: 39
Sedang mencari DENVER
Banyak percobaan : 176
Total execution time in milis: 62
Sedang mencari HARTFORD
Banyak percobaan : 315
Total execution time in milis: 47

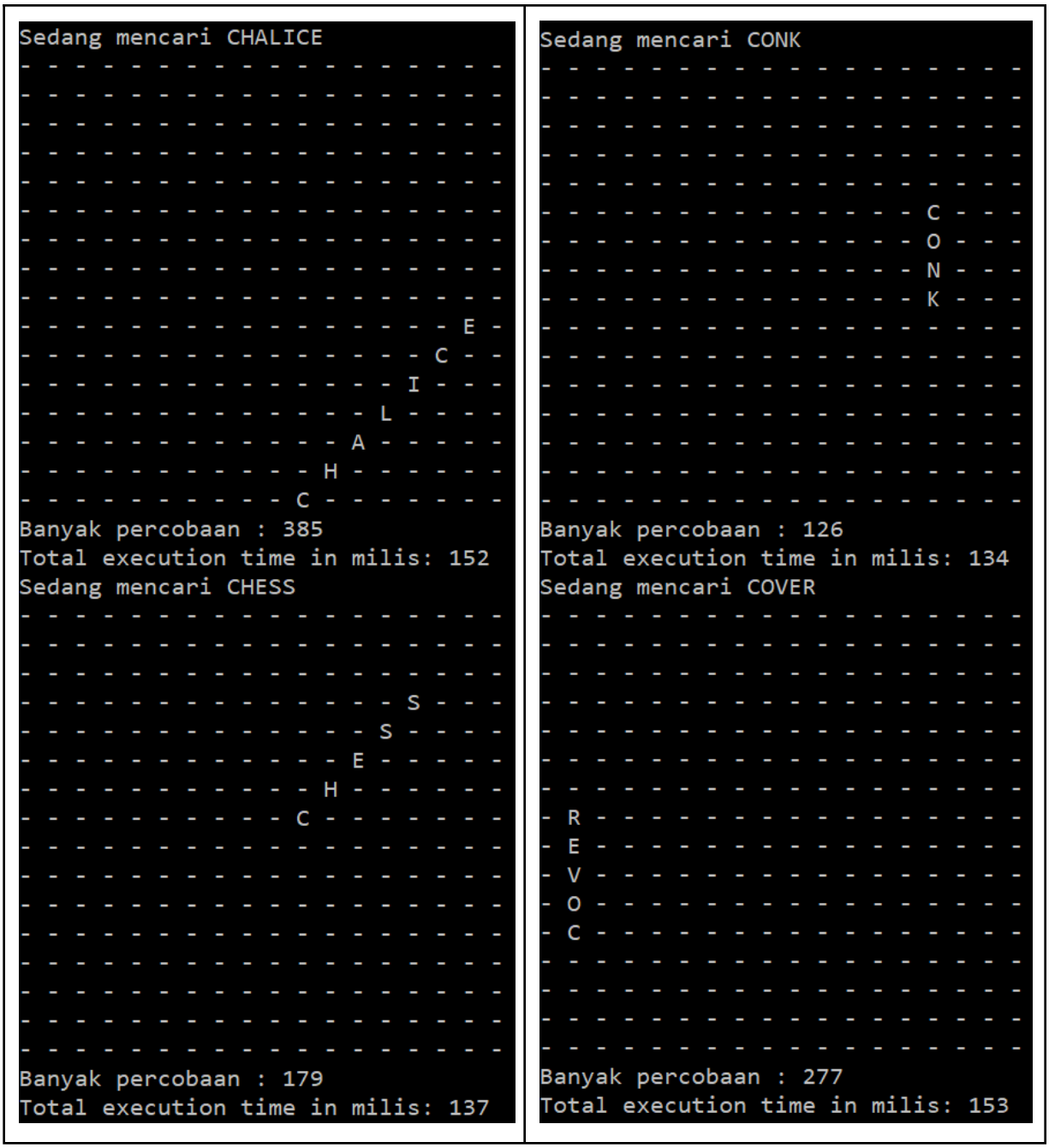
```
Sedang mencari JEFFERSONCITY
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - Y T I C N O S R E F F E J -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
Banyak percobaan : 253
Total execution time in milis: 64
Sedang mencari LANSING
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - -
- - G - - - - - - - - - - - - -
- - - N - - - - - - - - - - - -
- - - - I - - - - - - - - - - -
- - - - - S - - - - - - - - - -
- - - - - - N - - - - - - - - -
- - - - - - - A - - - - - - - -
- - - - - - - - L - - - - - - -
- - - - - - - - - - - - - - - -
Banyak percobaan : 324
Total execution time in milis: 40
```

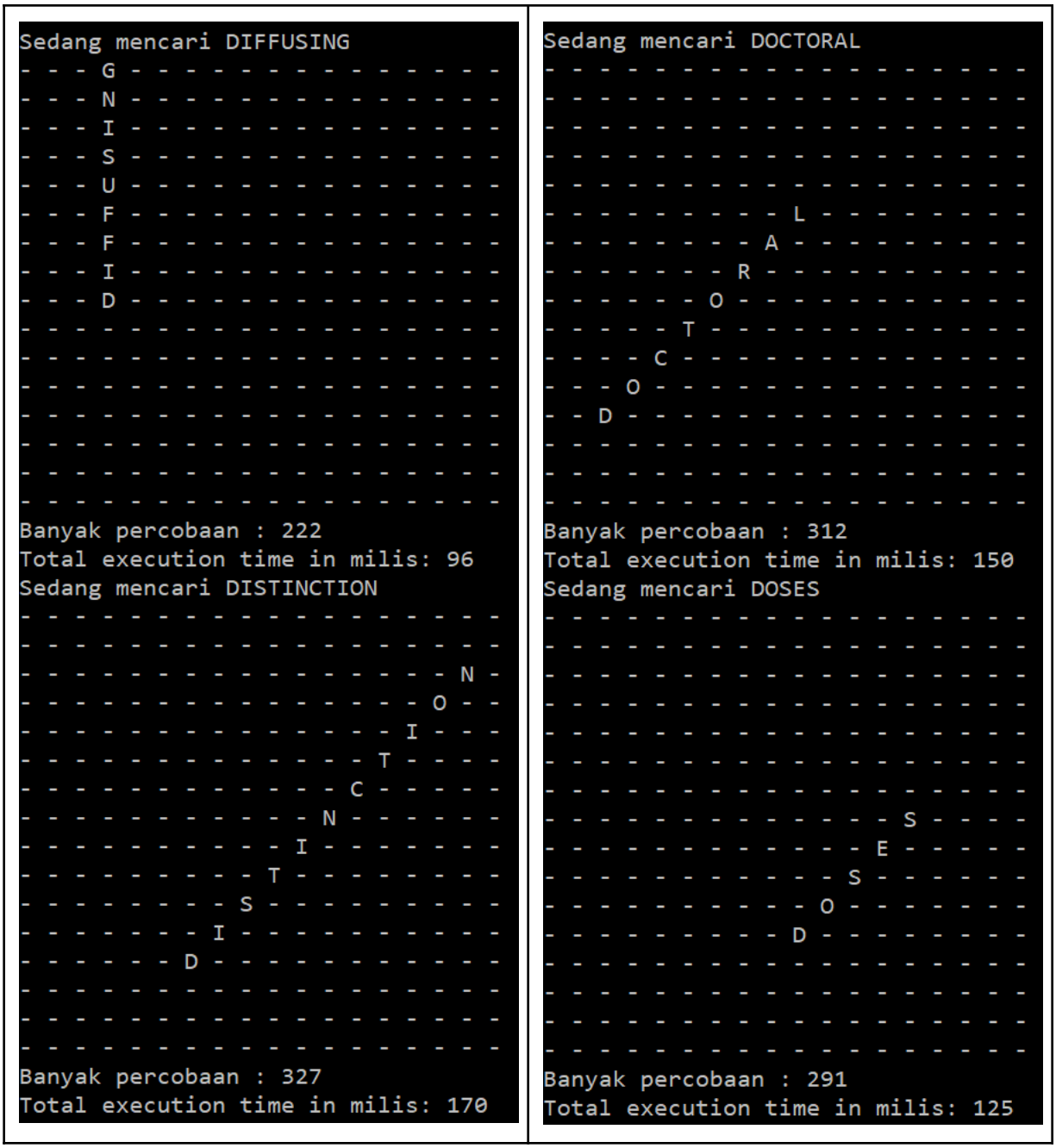
```
Sedang mencari MONTGOMERY
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- M - - - - - - - - - - - - - - -
- O - - - - - - - - - - - - - - -
- N - - - - - - - - - - - - - - -
- T - - - - - - - - - - - - - - -
- G - - - - - - - - - - - - - - -
- O - - - - - - - - - - - - - - -
- M - - - - - - - - - - - - - - -
- E - - - - - - - - - - - - - - -
- R - - - - - - - - - - - - - - -
- Y - - - - - - - - - - - - - - -
Banyak percobaan : 126
Total execution time in milis: 47
Sedang mencari NASHVILLE
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - N A S H V I L L E - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - -
Banyak percobaan : 236
Total execution time in milis: 61
```

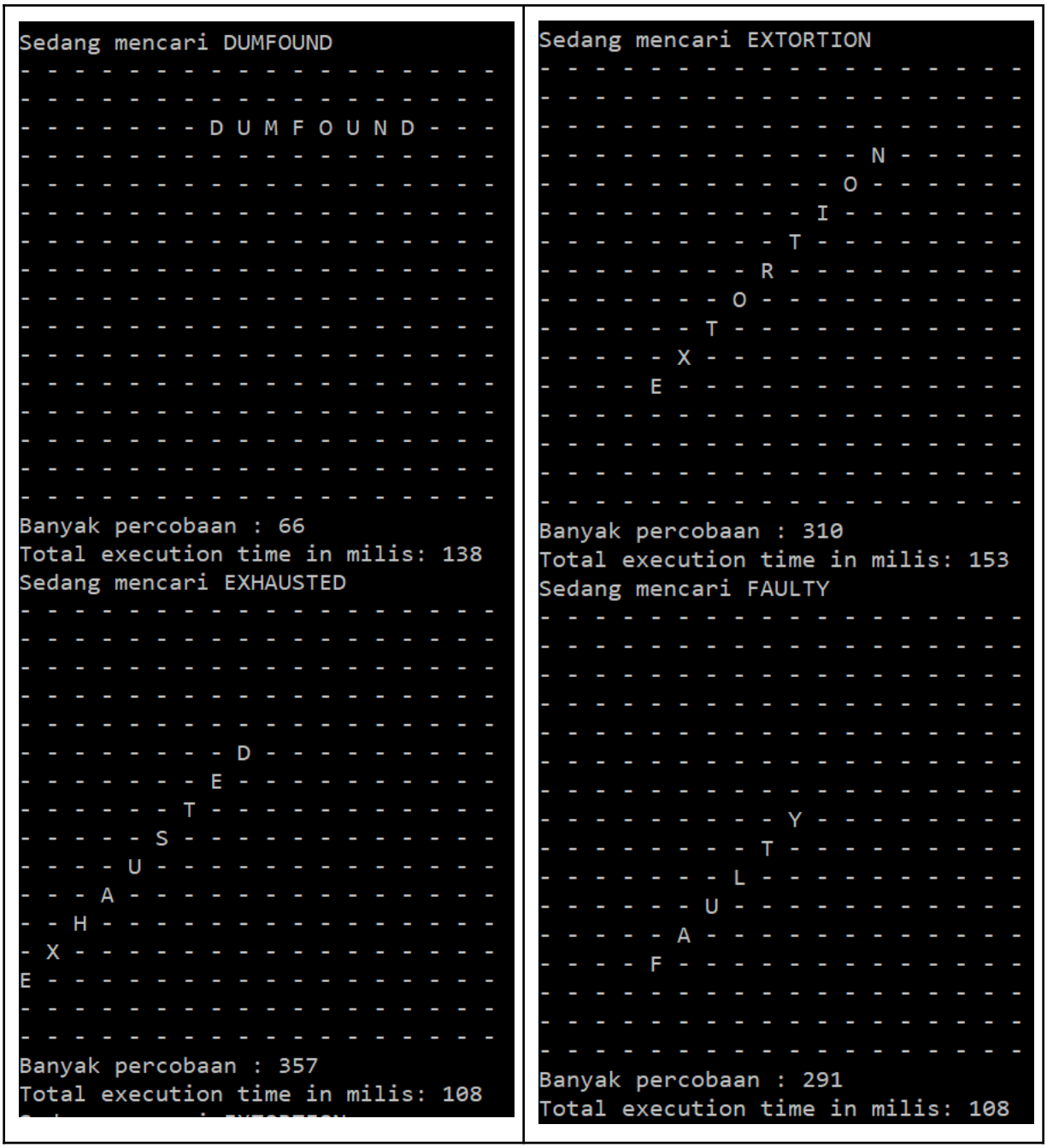


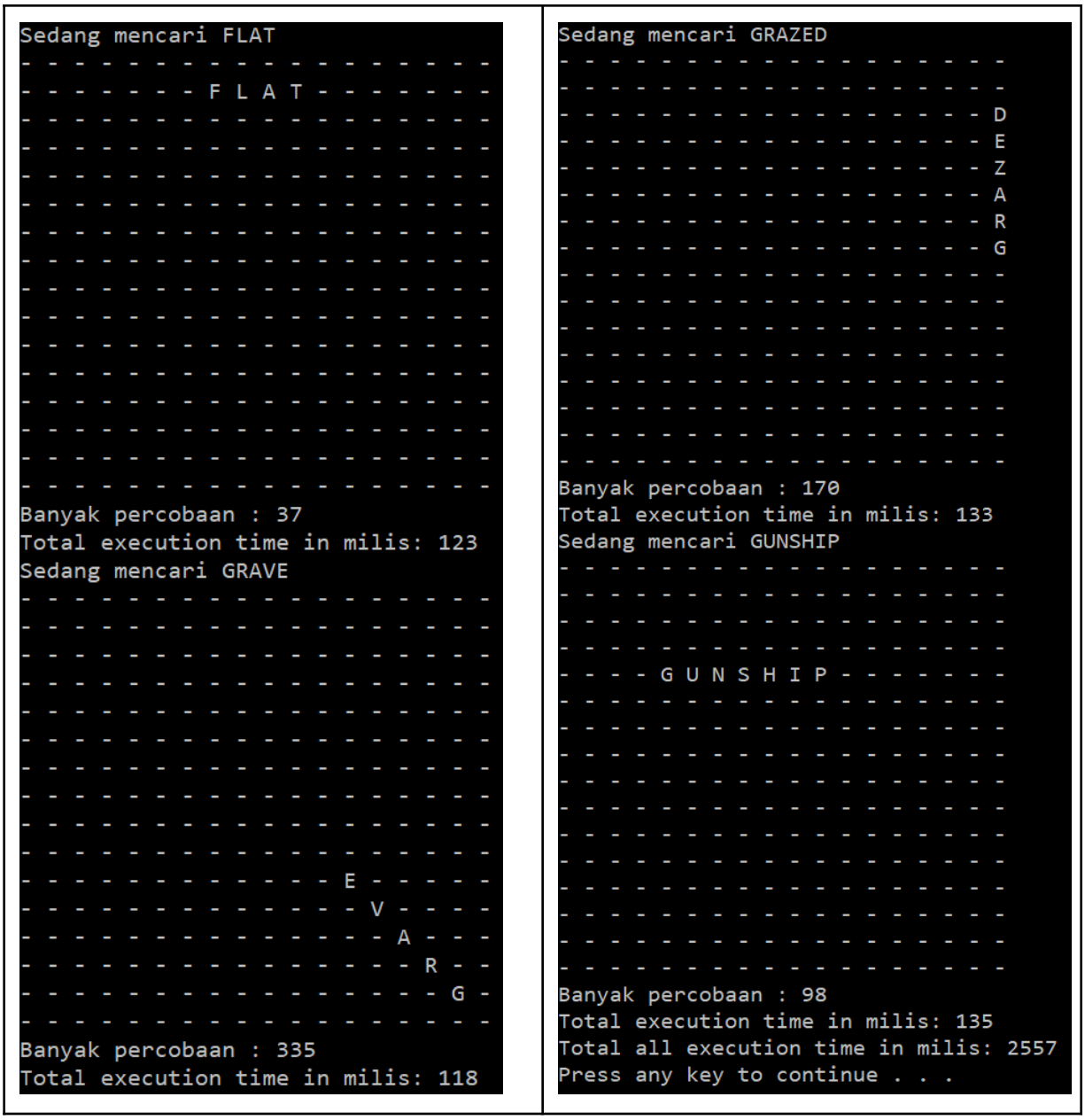
Gambar 2.2 Input Output Test Case Small 2


Welcome to Word Search Solver!
Please insert the puzzle file name :
Small3.txt
Sedang mencari ADMISSION
Banyak percobaan : 204
Total execution time in milis: 47
Sedang mencari AFFILIATE
Banyak percobaan : 379
Total execution time in milis: 22
Sedang mencari ASSURING
Banyak percobaan : 54
Total execution time in milis: 92
Sedang mencari BING
Banyak percobaan : 324
Total execution time in milis: 156

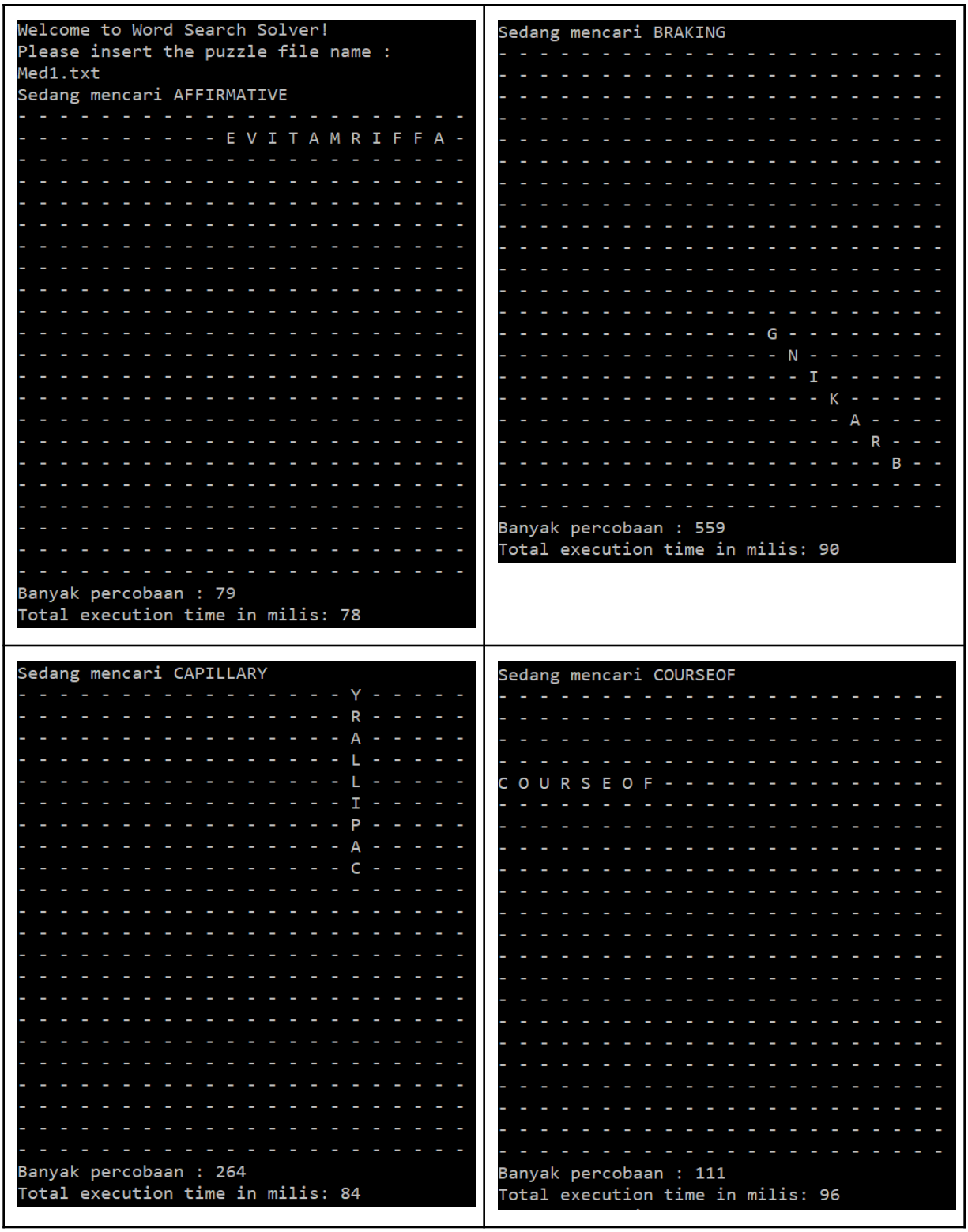

Sedang mencari CHALICE
Banyak percobaan : 385
Total execution time in milis: 152
Sedang mencari CHESS
Banyak percobaan : 179
Total execution time in milis: 137
Sedang mencari CONK
Banyak percobaan : 126
Total execution time in milis: 134
Sedang mencari COVER
Banyak percobaan : 277
Total execution time in milis: 153

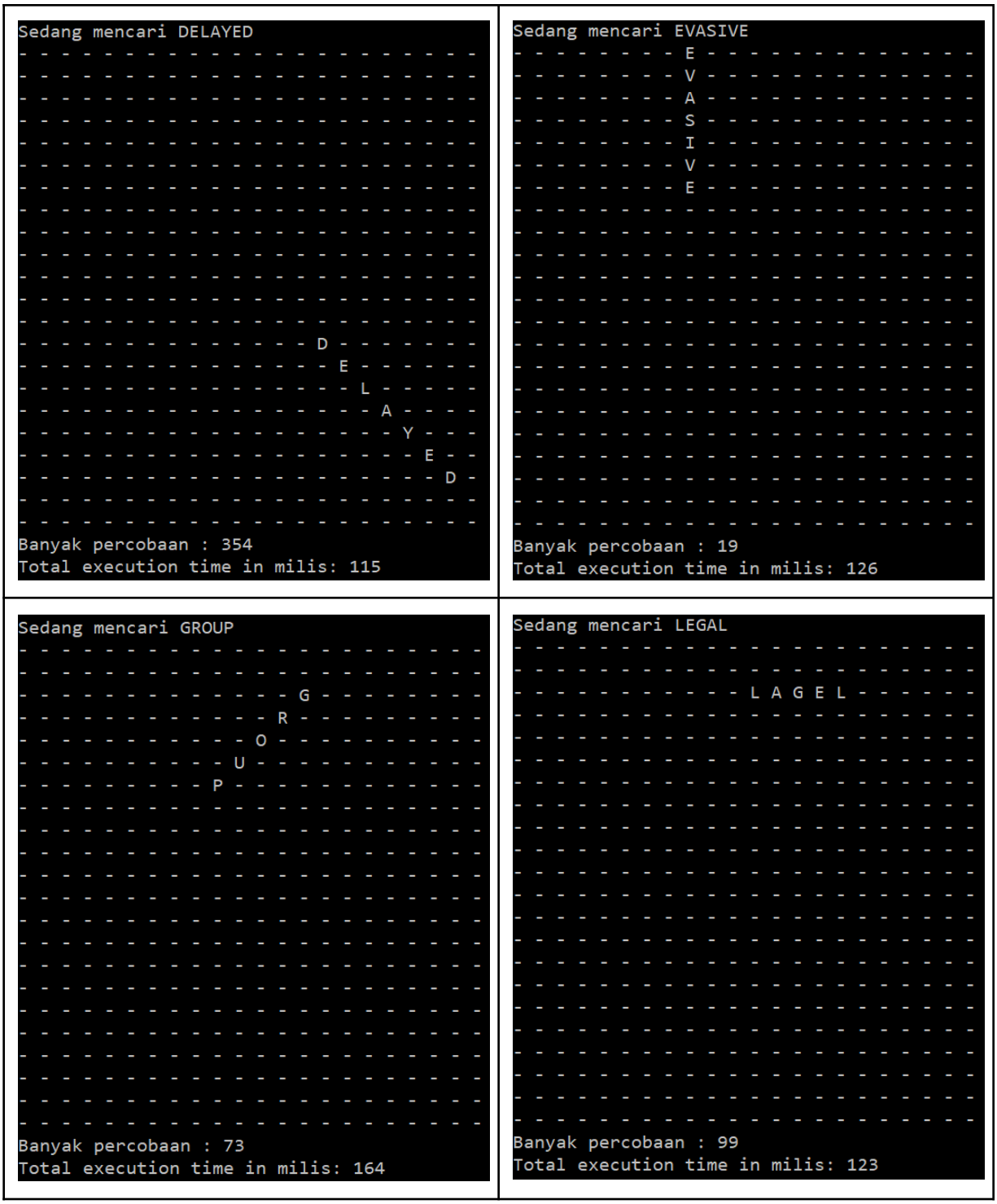

Sedang mencari DIFFUSING
Banyak percobaan : 222
Total execution time in milis: 96
Sedang mencari DISTINCTION
Banyak percobaan : 327
Total execution time in milis: 170
Sedang mencari DOCTORAL
Banyak percobaan : 312
Total execution time in milis: 150
Sedang mencari DOSES
Banyak percobaan : 291
Total execution time in milis: 125

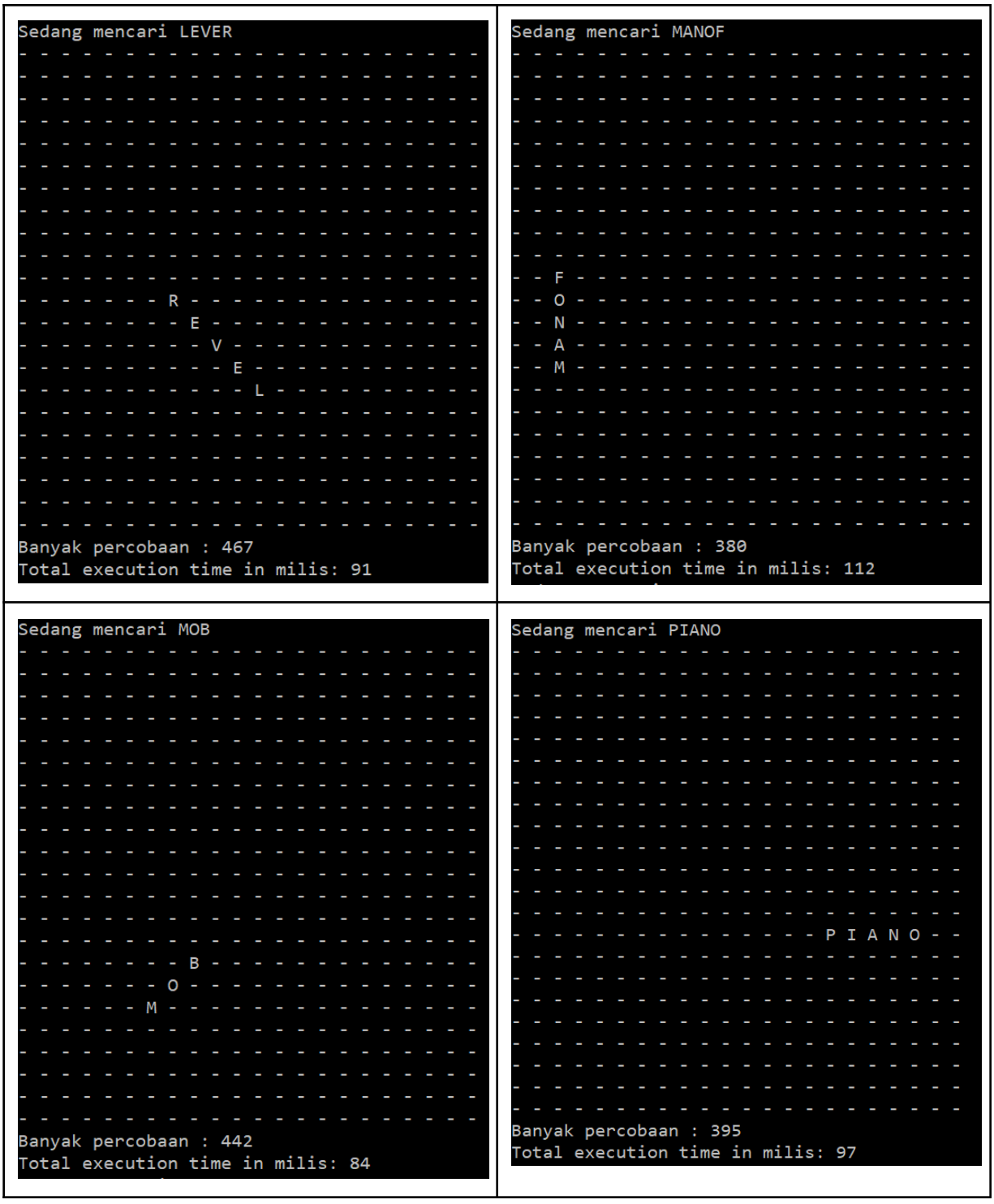

Sedang mencari DUMFOUND
Banyak percobaan : 66
Total execution time in milis: 138
Sedang mencari EXHAUSTED
Banyak percobaan : 357
Total execution time in milis: 108
Sedang mencari EXTORTION
Banyak percobaan : 310
Total execution time in milis: 153
Sedang mencari FAULTY
Banyak percobaan : 291
Total execution time in milis: 108

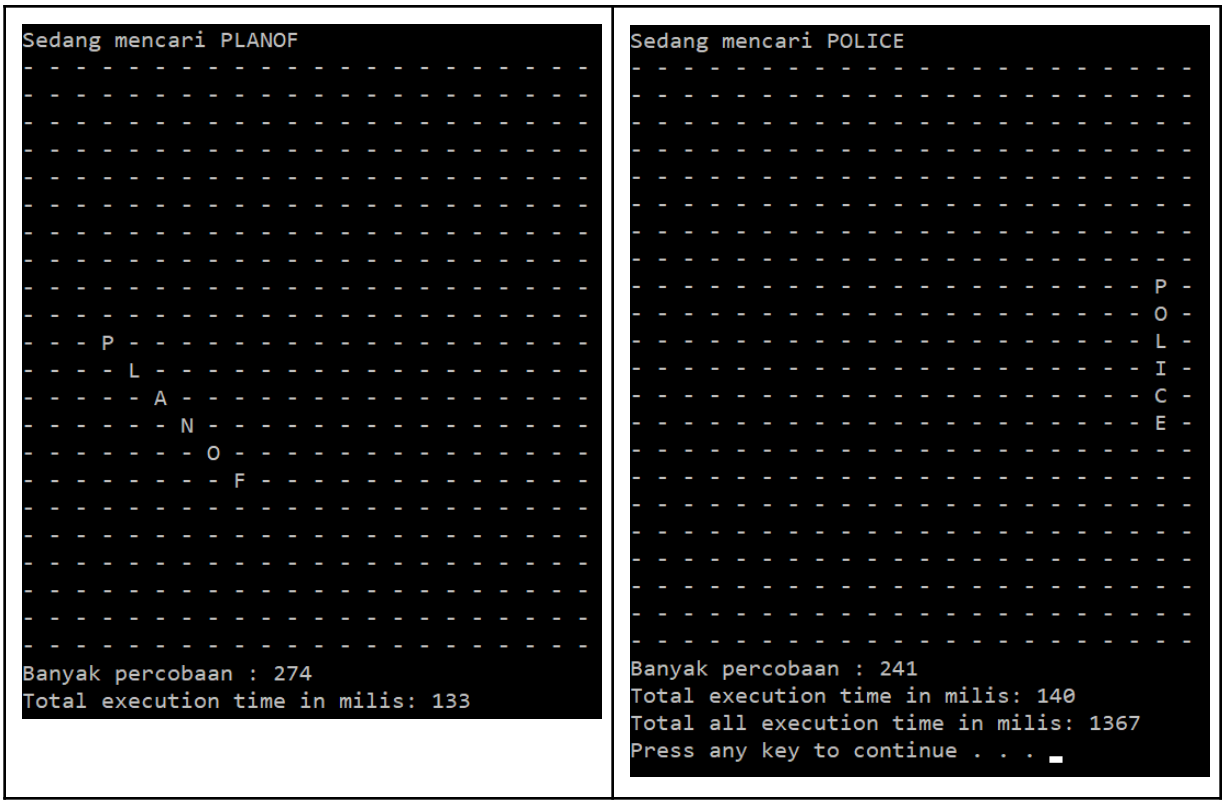


Gambar 2.3 Input dan Output Test Case Small 3

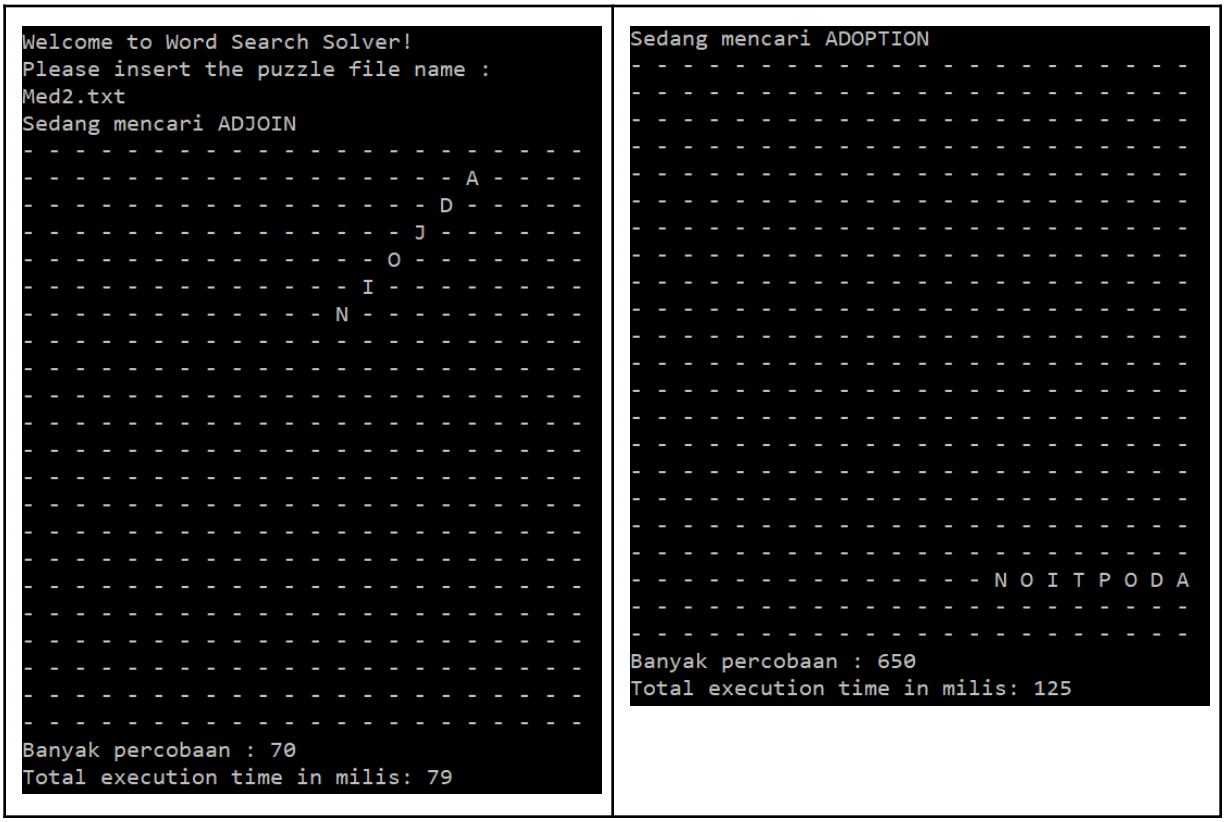

Welcome to Word Search Solver!
Please insert the puzzle file name :
Med1.txt
Sedang mencari AFFIRMATIVE
E V I T A M R I F F A
Banyak percobaan : 79
Total execution time in milis: 78
Sedang mencari BRAKING
G
N
I
K
A
R
B
Banyak percobaan : 559
Total execution time in milis: 90
Sedang mencari CAPILLARY
Y
R
A
L
L
I
P
A
C
Banyak percobaan : 264
Total execution time in milis: 84
Sedang mencari COURSEOF
C O U R S E O F
Banyak percobaan : 111
Total execution time in milis: 96

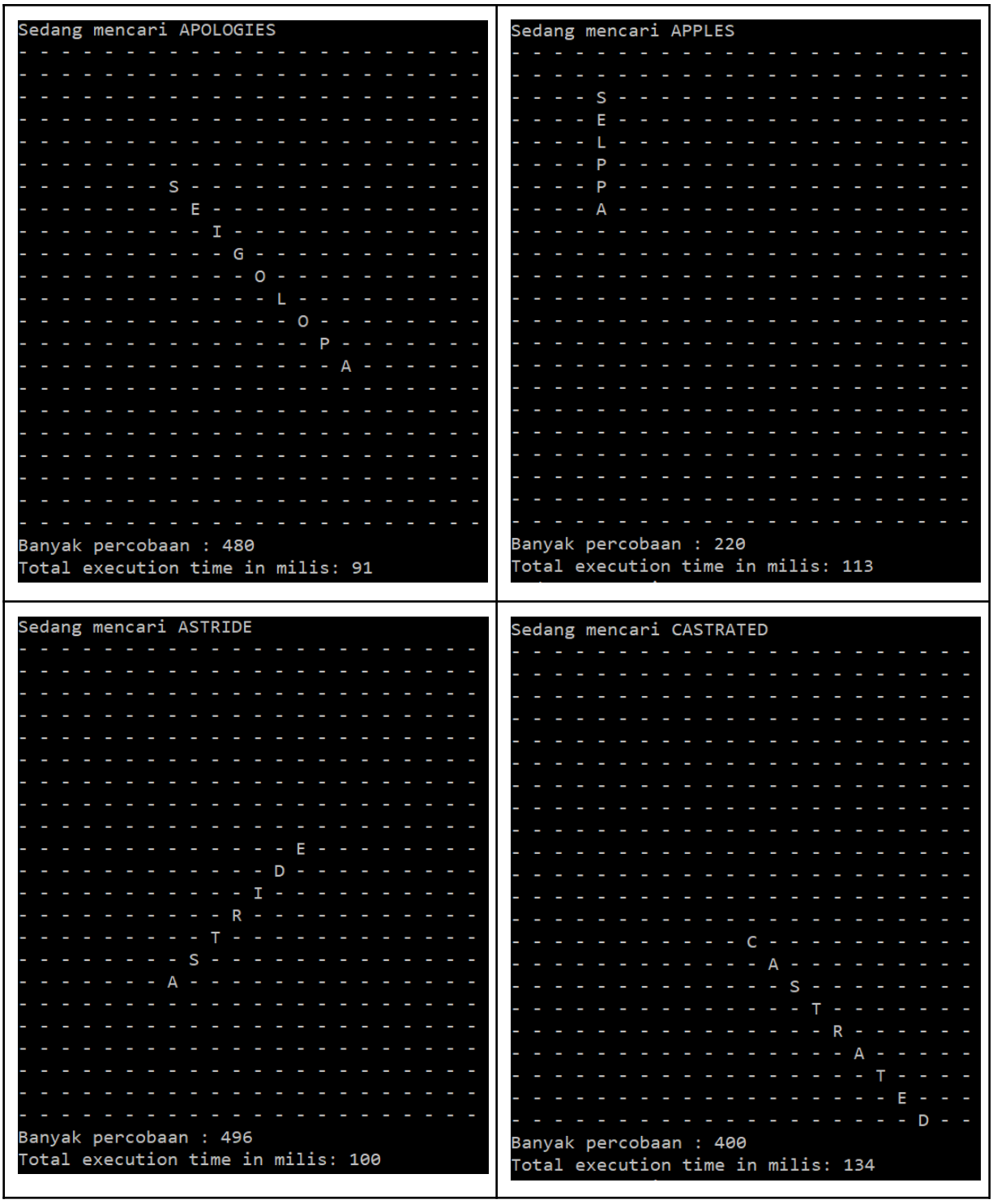

Sedang mencari DELAYED
Banyak percobaan : 354
Total execution time in milis: 115
Sedang mencari EVASIVE
Banyak percobaan : 19
Total execution time in milis: 126
Sedang mencari GROUP
Banyak percobaan : 73
Total execution time in milis: 164
Sedang mencari LEGAL
Banyak percobaan : 99
Total execution time in milis: 123

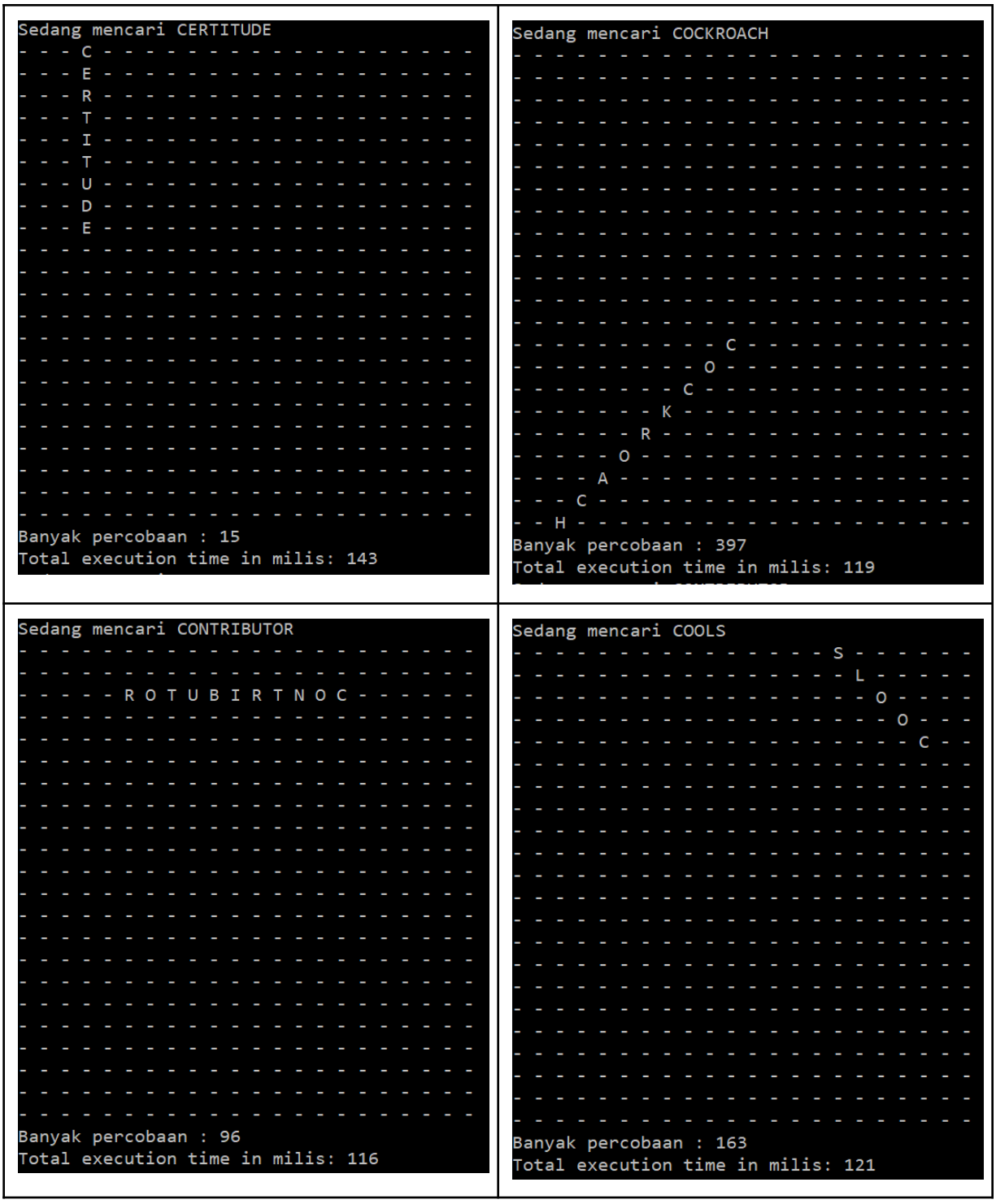

Sedang mencari LEVER
R
E
V
E
L
Banyak percobaan : 467
Total execution time in milis: 91
Sedang mencari MANOF
F
O
N
A
M
Banyak percobaan : 380
Total execution time in milis: 112
Sedang mencari MOB
B
O
M
Banyak percobaan : 442
Total execution time in milis: 84
Sedang mencari PIANO
P I A N O
Banyak percobaan : 395
Total execution time in milis: 97

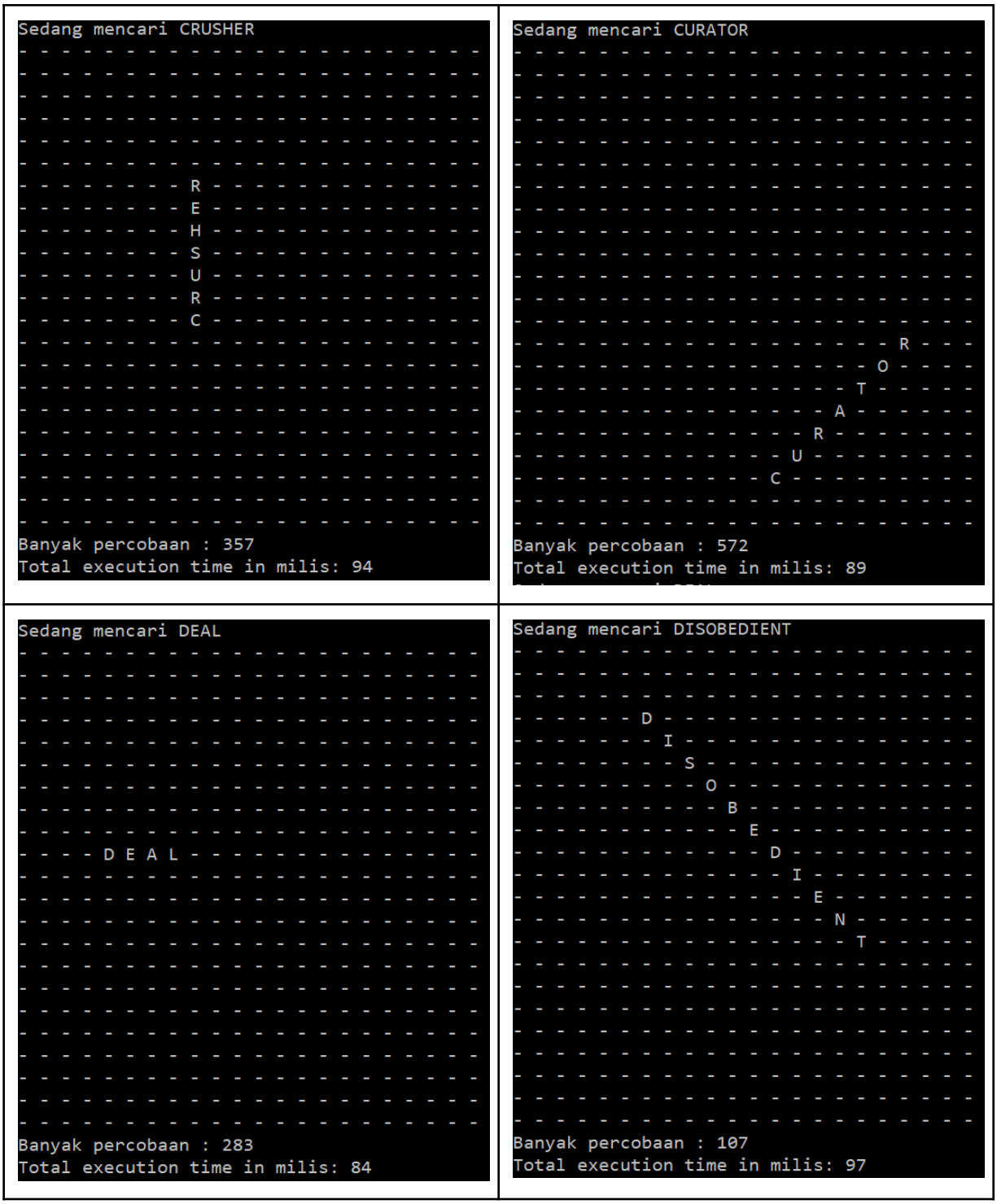


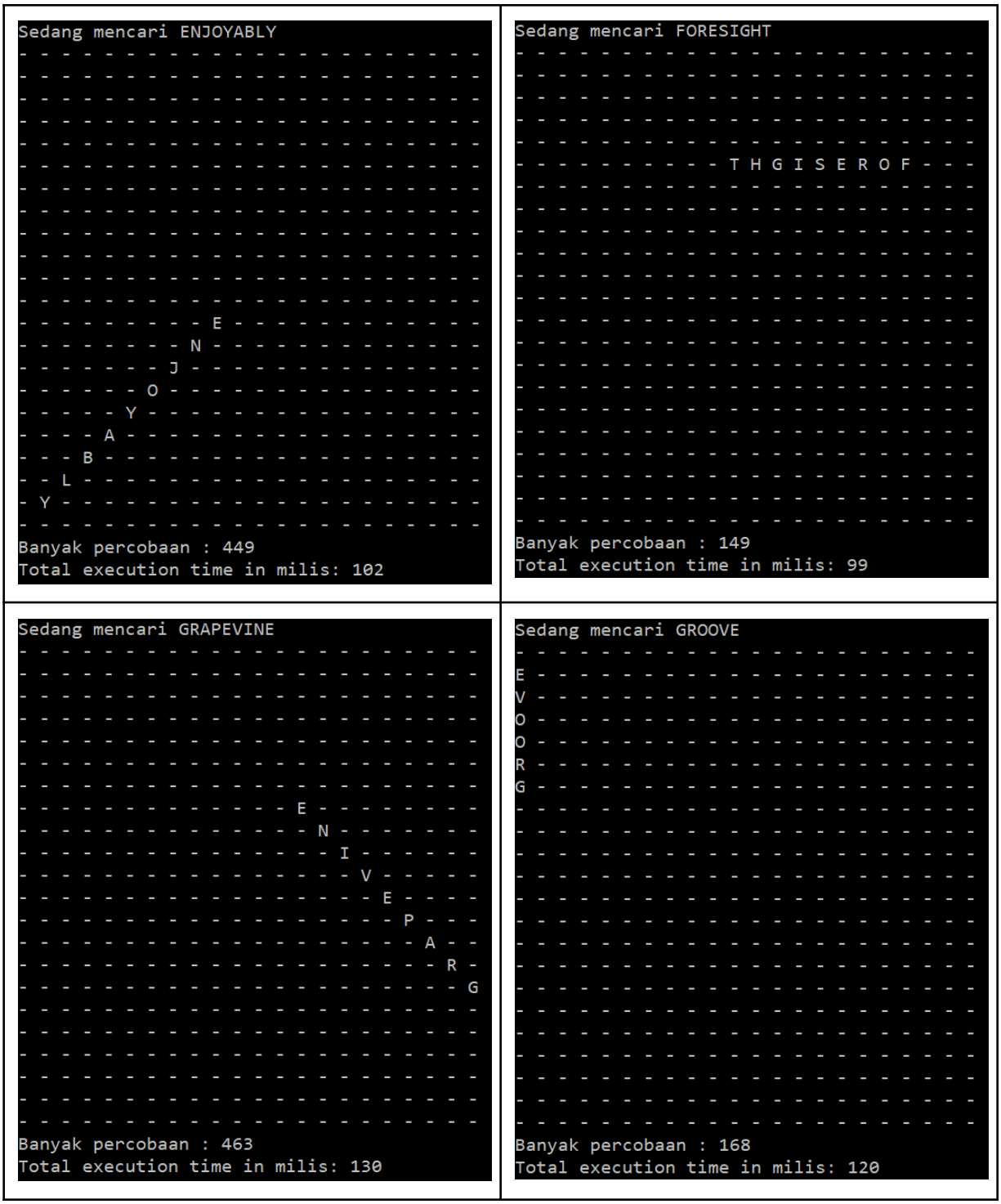
Gambar 2.4 Input dan Output Test Case Medium 1

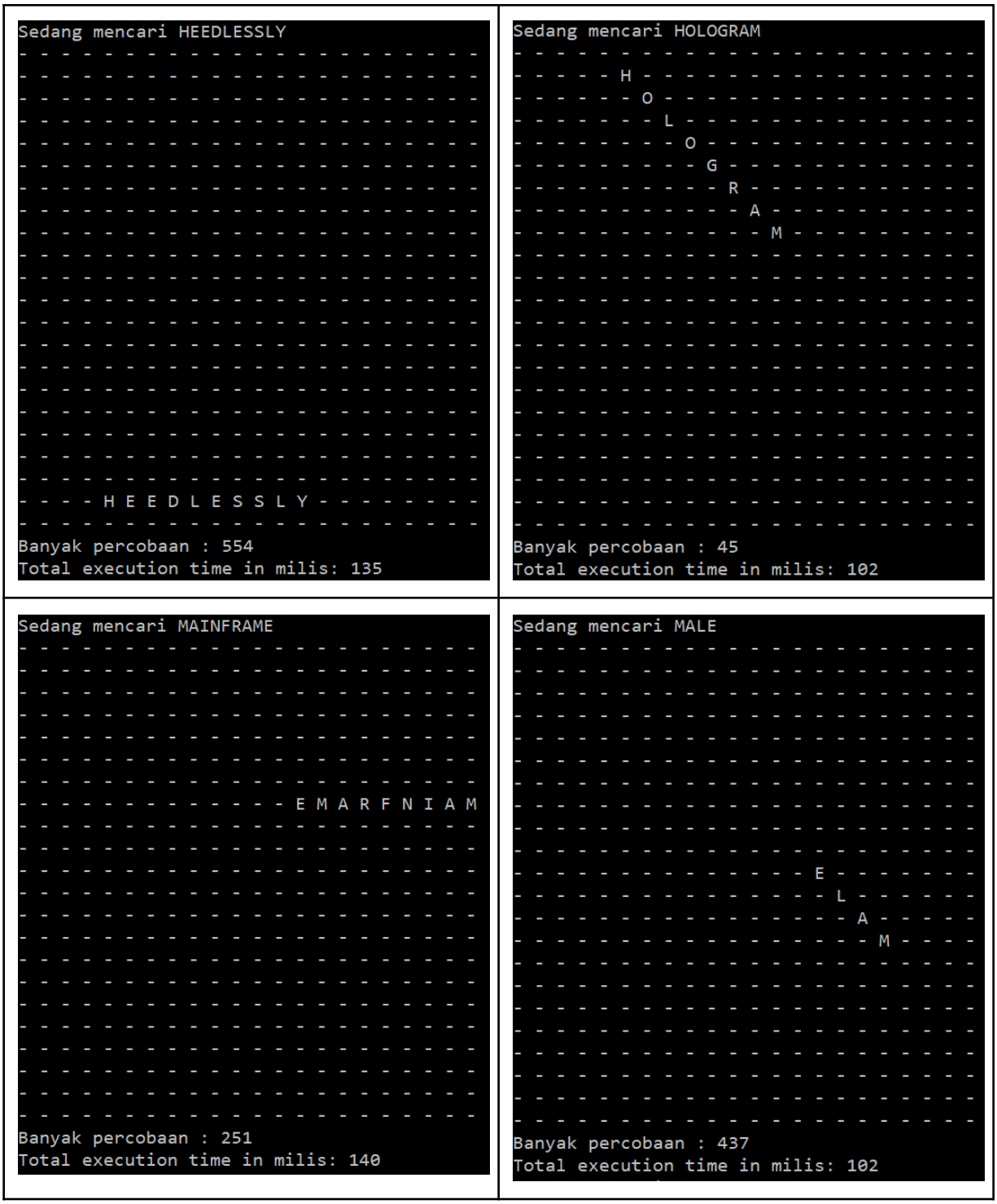



Sedang mencari APOLOGIES
Banyak percobaan : 480
Total execution time in milis: 91
Sedang mencari APPLES
Banyak percobaan : 220
Total execution time in milis: 113
Sedang mencari ASTRIDE
Banyak percobaan : 496
Total execution time in milis: 100
Sedang mencari CASTRATED
Banyak percobaan : 400
Total execution time in milis: 134


Sedang mencari CERTITUDE
Banyak percobaan : 15
Total execution time in milis: 143
Sedang mencari COCKROACH
Banyak percobaan : 397
Total execution time in milis: 119
Sedang mencari CONTRIBUTOR
Banyak percobaan : 96
Total execution time in milis: 116
Sedang mencari COOLS
Banyak percobaan : 163
Total execution time in milis: 121


Sedang mencari CRUSHER
Banyak percobaan : 357
Total execution time in milis: 94
Sedang mencari CURATOR
Banyak percobaan : 572
Total execution time in milis: 89
Sedang mencari DEAL
Banyak percobaan : 283
Total execution time in milis: 84
Sedang mencari DISOBEDIENT
Banyak percobaan : 107
Total execution time in milis: 97

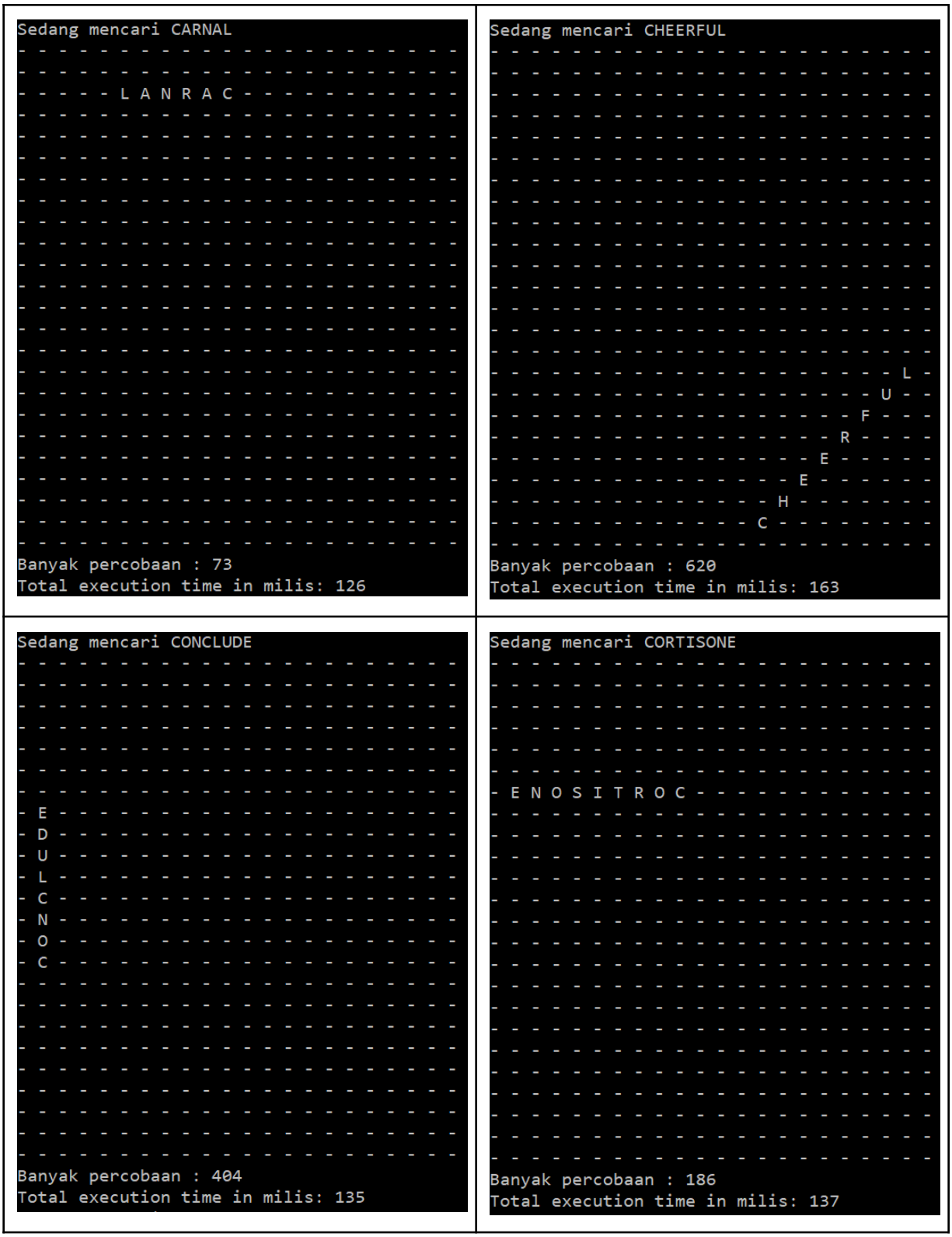

Sedang mencari ENJOYABLY
Banyak percobaan : 449
Total execution time in milis: 102
Sedang mencari FORESIGHT
T H G I S E R O F
Banyak percobaan : 149
Total execution time in milis: 99
Sedang mencari GRAPEVINE
Banyak percobaan : 463
Total execution time in milis: 130
Sedang mencari GROOVE
Banyak percobaan : 168
Total execution time in milis: 120


Sedang mencari HEEDLESSLY
H E E D L E S S L Y
Banyak percobaan : 554
Total execution time in milis: 135
Sedang mencari HOLOGRAM
H
O
L
O
G
R
A
M
Banyak percobaan : 45
Total execution time in milis: 102
Sedang mencari MAINFRAME
E M A R F N I A M
Banyak percobaan : 251
Total execution time in milis: 140
Sedang mencari MALE
E
L
A
M
Banyak percobaan : 437
Total execution time in milis: 102

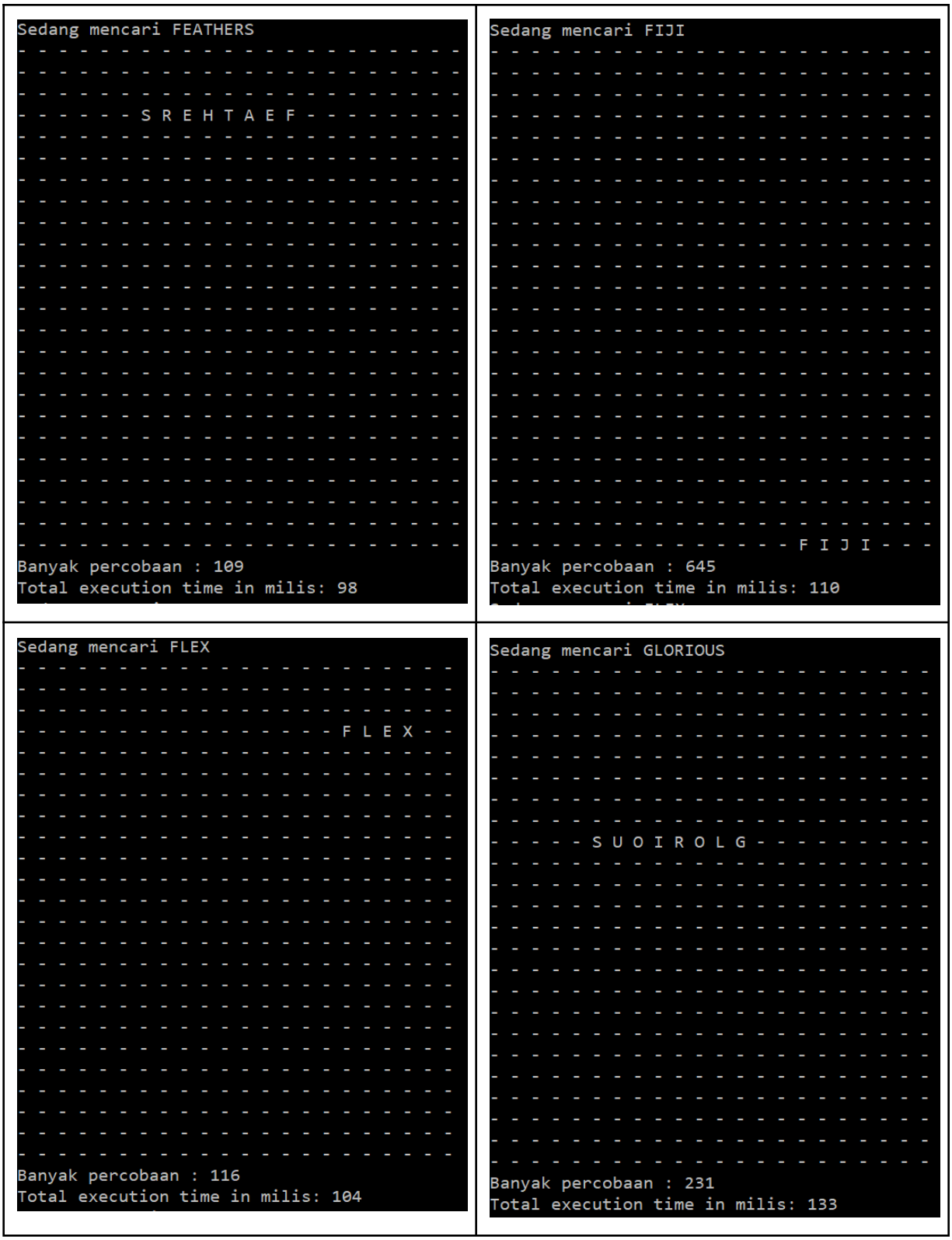

Sedang mencari NORTHBOUND
Banyak percobaan : 613
Total execution time in milis: 108
Sedang mencari OBSERVABLE
Banyak percobaan : 713
Total execution time in milis: 98
Sedang mencari PRIMITIVELY
Banyak percobaan : 16
Total execution time in milis: 132
Sedang mencari PUNGENTLY
Banyak percobaan : 523
Total execution time in milis: 144

Gambar 2.5 Input dan Output Test Case Medium 2

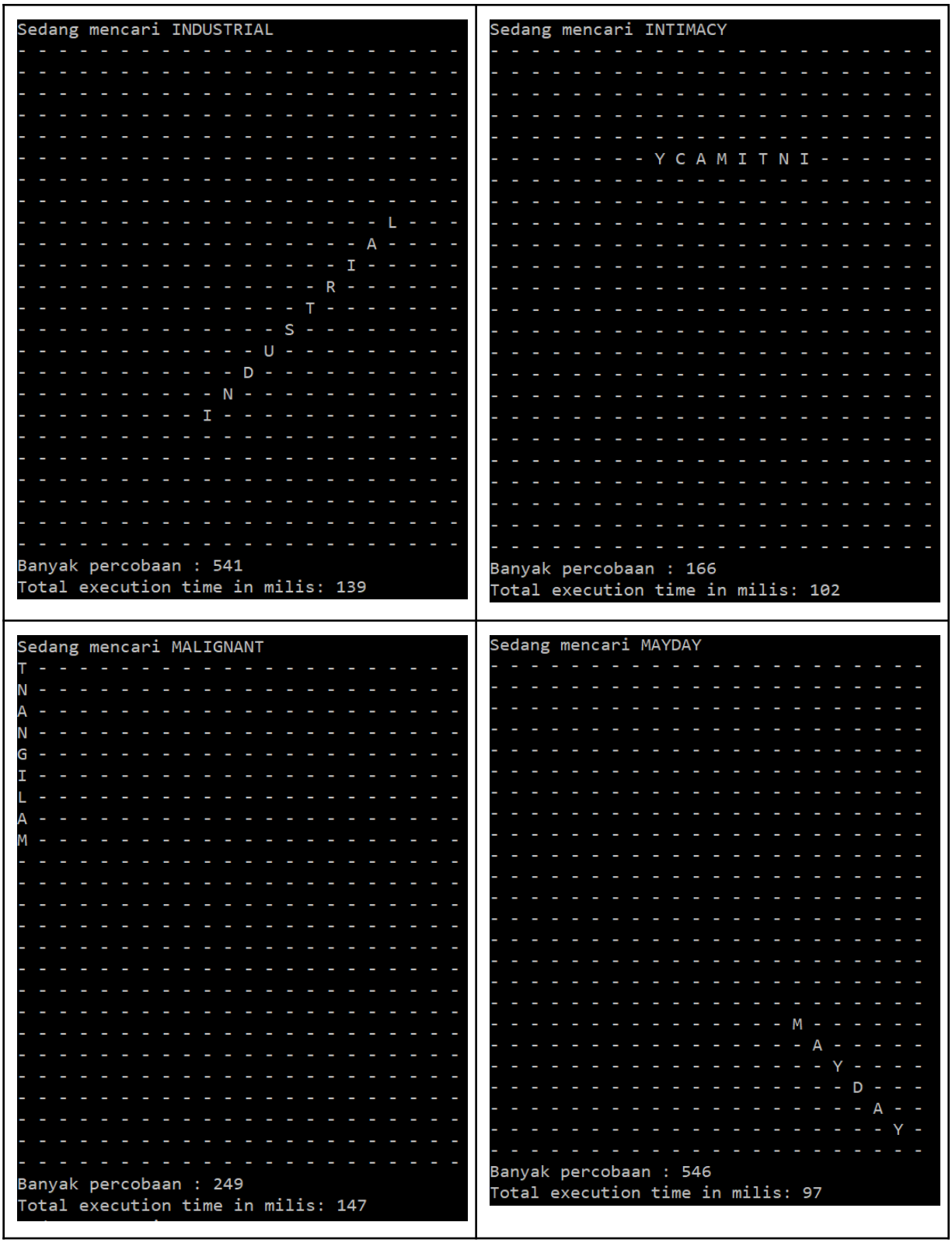

Welcome to Word Search Solver!
Please insert the puzzle file name :
Med3.txt
Sedang mencari ACADEME
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - E M E D A C A -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
Banyak percobaan : 184
Total execution time in milis: 86
Sedang mencari ANNEX
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - A - - - - - - - - - - - - - - - -
- - - - N - - - - - - - - - - - - - - -
- - - - - N - - - - - - - - - - - - - -
- - - - - - E - - - - - - - - - - - - -
- - - - - - - X - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
Banyak percobaan : 345
Total execution time in milis: 116
Sedang mencari BACKPACKING
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - B A C K P A C K I N G -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
Banyak percobaan : 206
Total execution time in milis: 169
Sedang mencari BALLROOM
- - - - - - - - - - - - - - - - - - - -
- - - - - - M O O R L L A B - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
Banyak percobaan : 48
Total execution time in milis: 114

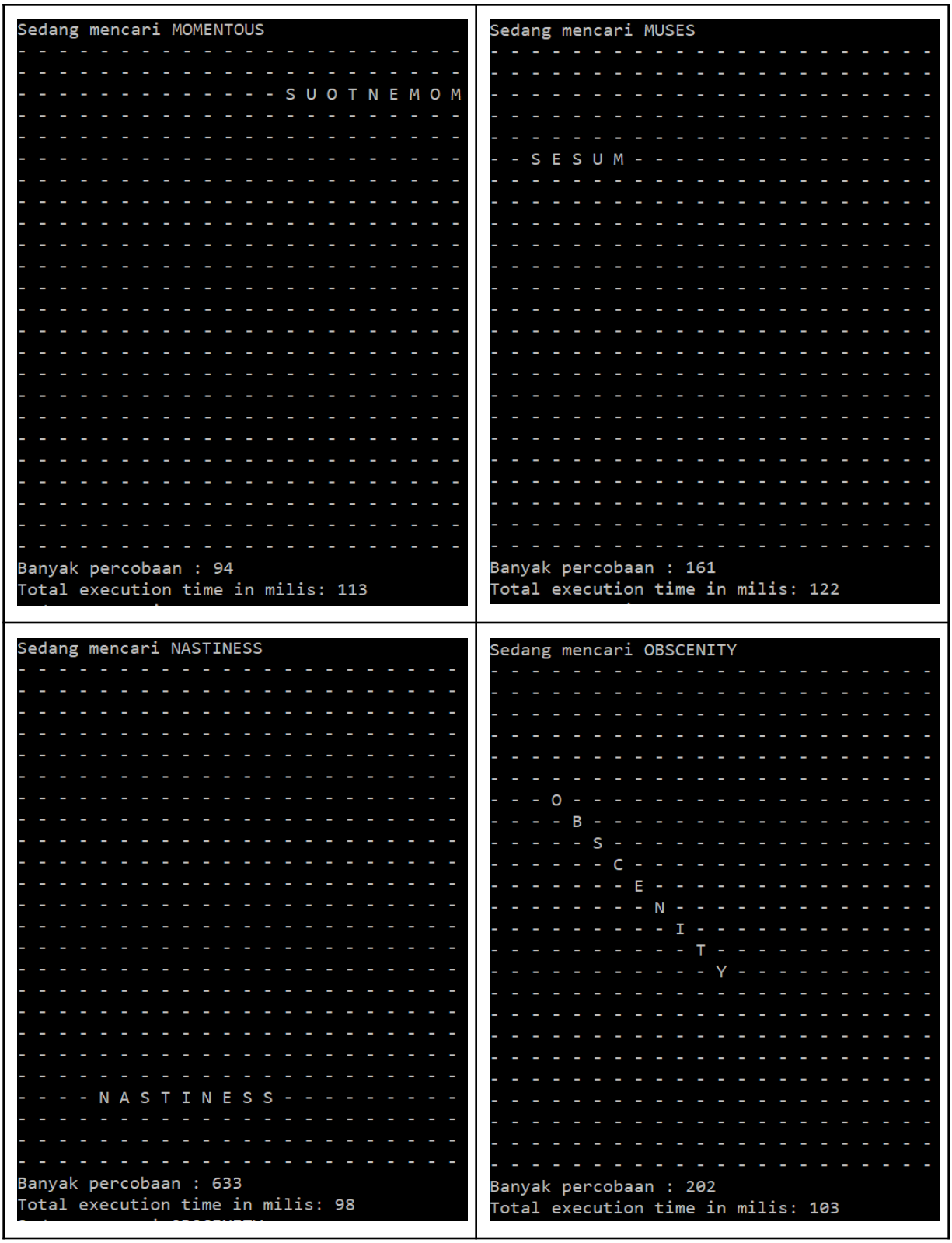

Sedang mencari CARNAL
L A N R A C
Banyak percobaan : 73
Total execution time in milis: 126
Sedang mencari CHEERFUL
L
U
F
R
E
E
H
C
Banyak percobaan : 620
Total execution time in milis: 163
Sedang mencari CONCLUDE
E
D
U
L
C
N
O
C
Banyak percobaan : 404
Total execution time in milis: 135
Sedang mencari CORTISONE
E N O S I T R O C
Banyak percobaan : 186
Total execution time in milis: 137

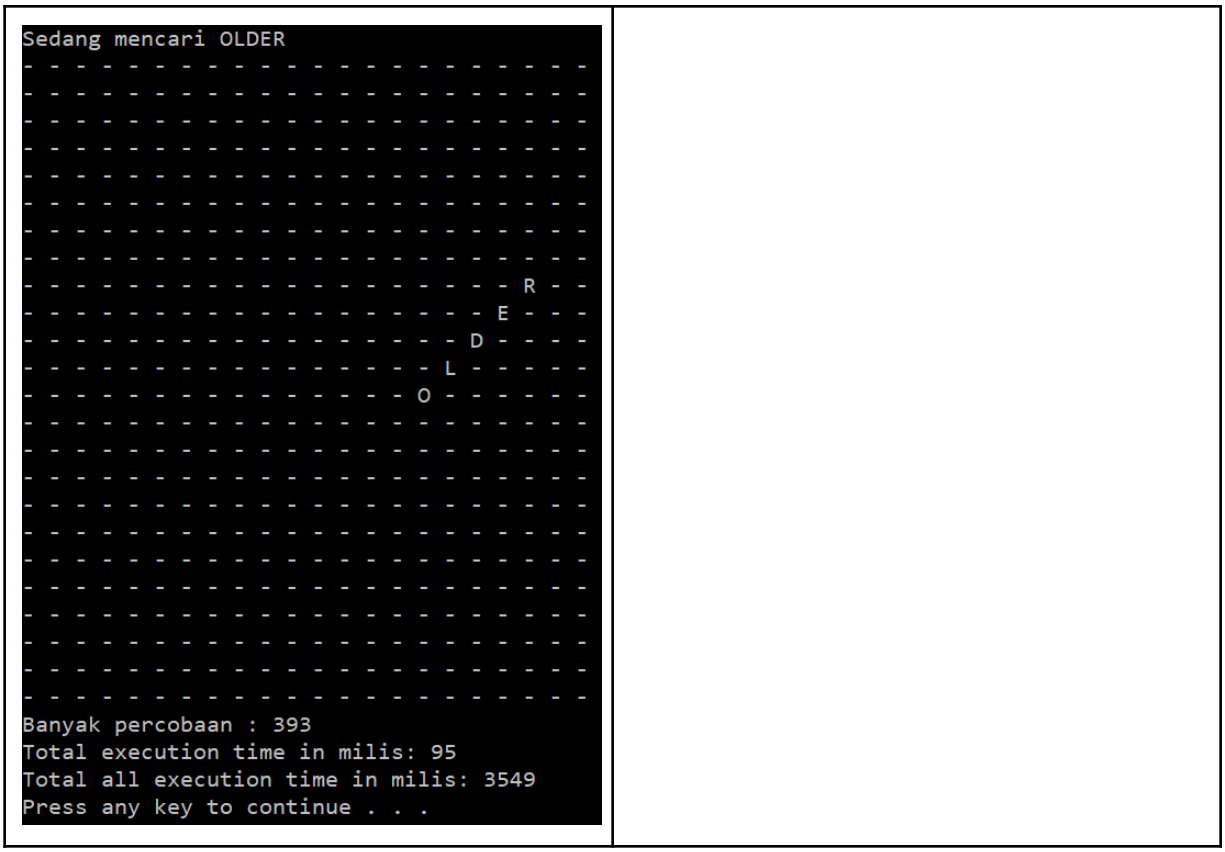

Sedang mencari DANGLING
- - - - - - - D A N G L I N G - - - - - - -
Banyak percobaan : 273
Total execution time in milis: 113
Sedang mencari DOUBLED
- - - - - - - - D O U B L E D - - - - - - -
Banyak percobaan : 595
Total execution time in milis: 134
Sedang mencari DUPLICITY
- Y T I C I L P U D - - - - - - - - - - - -
Banyak percobaan : 454
Total execution time in milis: 131
Sedang mencari ECTOPLASM
M -
S -
A -
L -
P -
O -
T -
C -
E -
Banyak percobaan : 732
Total execution time in milis: 127


Sedang mencari FEATHERS
S R E H T A E F
Banyak percobaan : 109
Total execution time in milis: 98
Sedang mencari FIJI
F I J I
Banyak percobaan : 645
Total execution time in milis: 110
Sedang mencari FLEX
F L E X
Banyak percobaan : 116
Total execution time in milis: 104
Sedang mencari GLORIOUS
S U O I R O L G
Banyak percobaan : 231
Total execution time in milis: 133

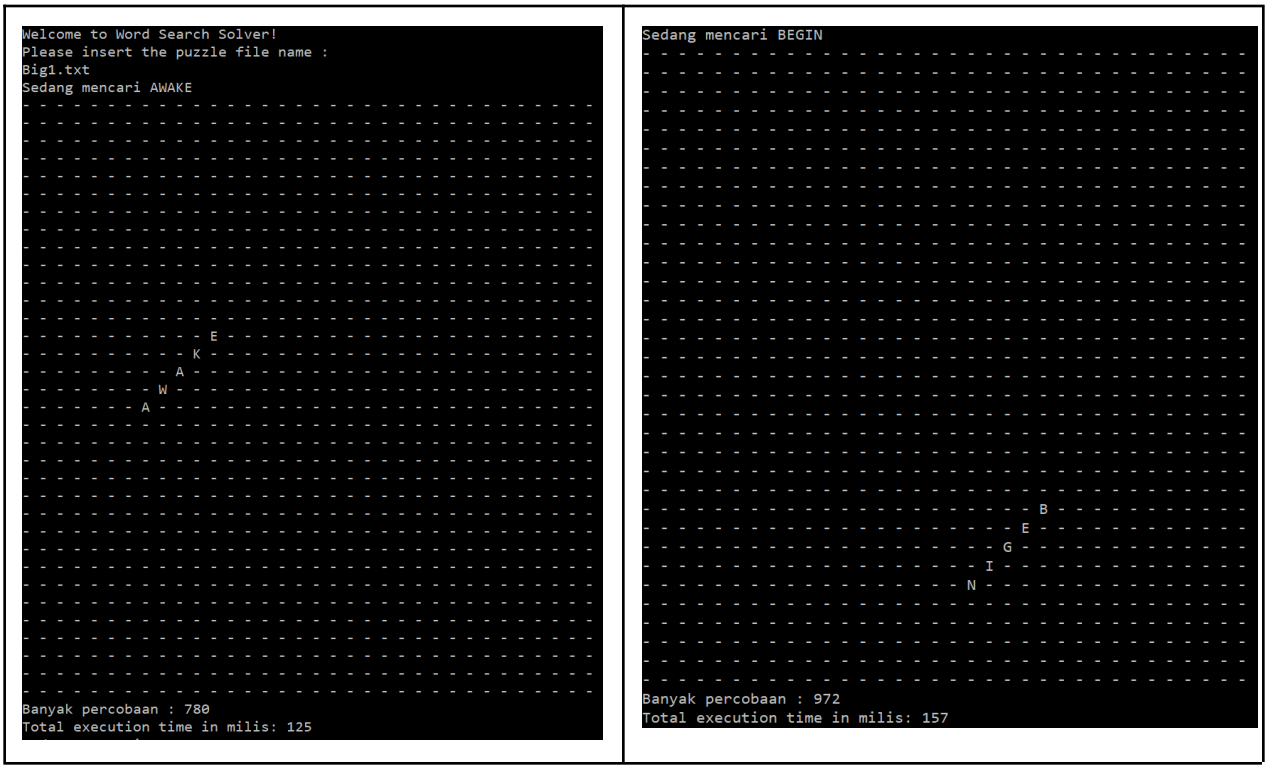

Sedang mencari HARVESTING
G N I T S E V R A H
Banyak percobaan : 578
Total execution time in milis: 111
Sedang mencari HOMES
H O M E S
Banyak percobaan : 368
Total execution time in milis: 116
Sedang mencari HOMEWORK
H O M E W O R K
Banyak percobaan : 366
Total execution time in milis: 84
Sedang mencari IMMIGRATION
I M M I G R A T I O N
Banyak percobaan : 381
Total execution time in milis: 145

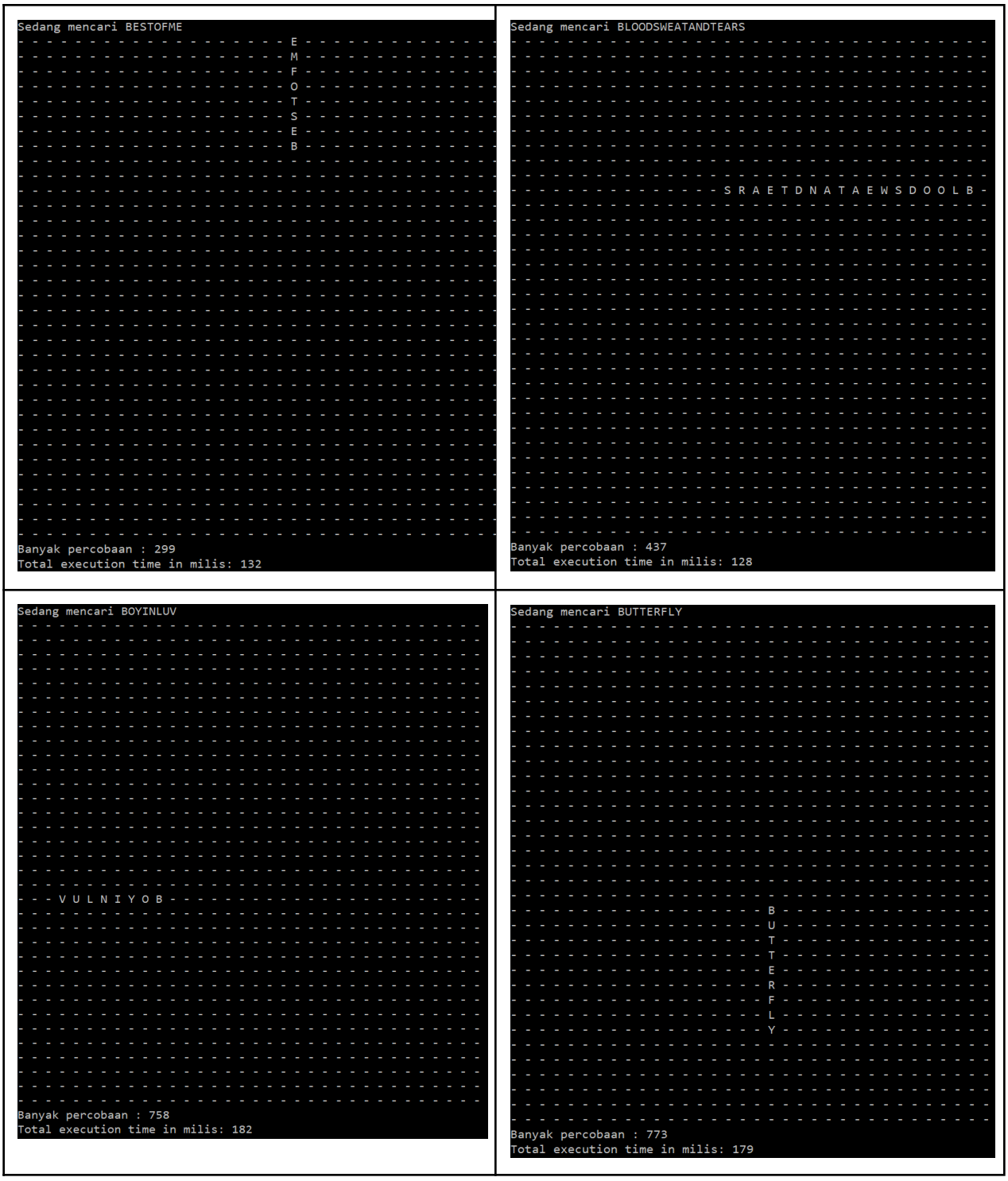

Sedang mencari INDUSTRIAL
Banyak percobaan : 541
Total execution time in milis: 139
Sedang mencari INTIMACY
Y C A M I T N I
Banyak percobaan : 166
Total execution time in milis: 102
Sedang mencari MALIGNANT
Banyak percobaan : 249
Total execution time in milis: 147
Sedang mencari MAYDAY
Banyak percobaan : 546
Total execution time in milis: 97

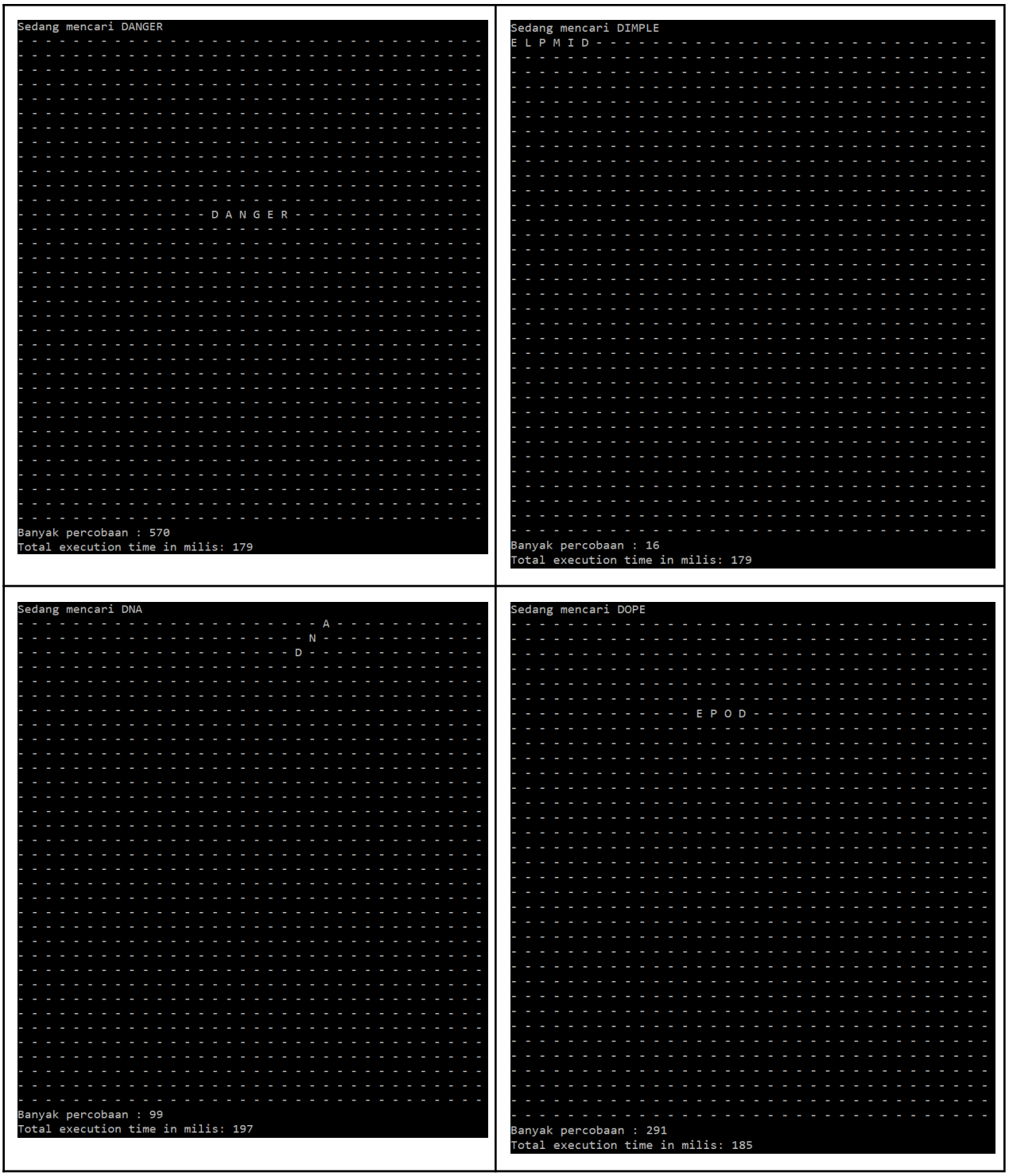

Sedang mencari MOMENTOUS
S U O T N E M O M
Banyak percobaan : 94
Total execution time in milis: 113
Sedang mencari MUSES
S E S U M
Banyak percobaan : 161
Total execution time in milis: 122
Sedang mencari NASTINESS
N A S T I N E S S
Banyak percobaan : 633
Total execution time in milis: 98
Sedang mencari OBSCENITY
O
B
S
C
E
N
I
T
Y
Banyak percobaan : 202
Total execution time in milis: 103

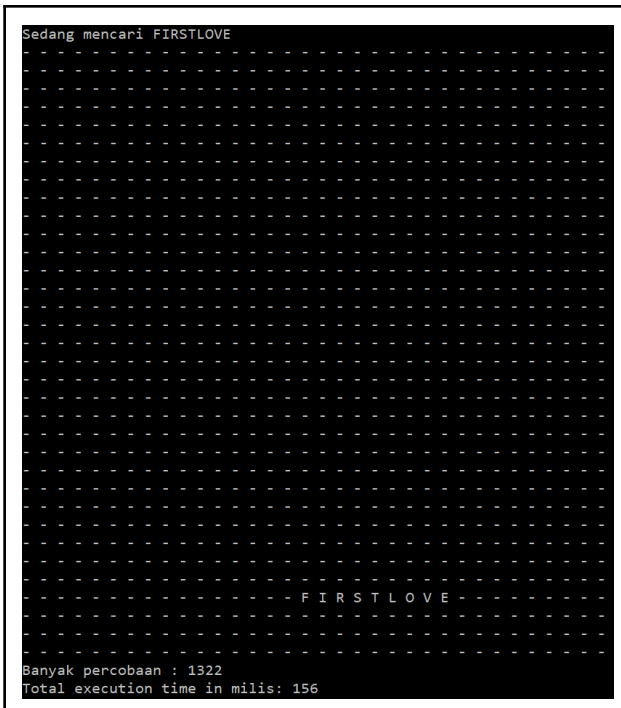


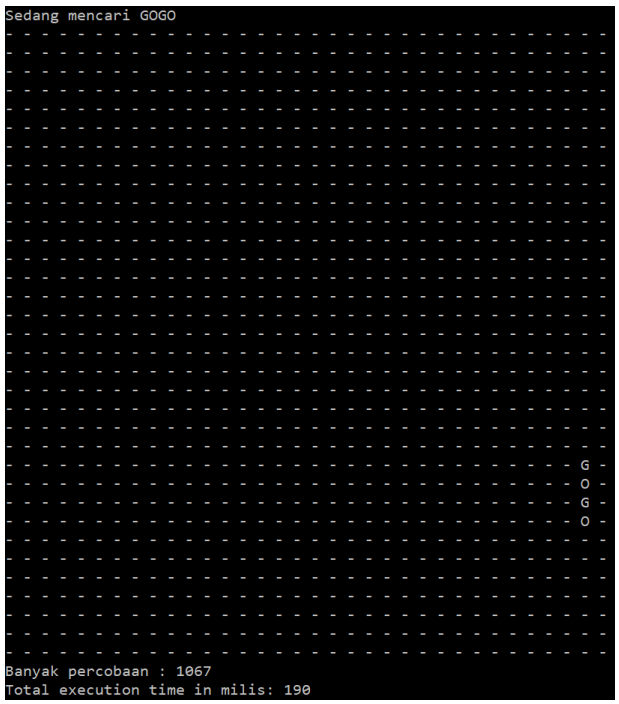
Gambar 2.6 Input dan Output Test Case Medium 3

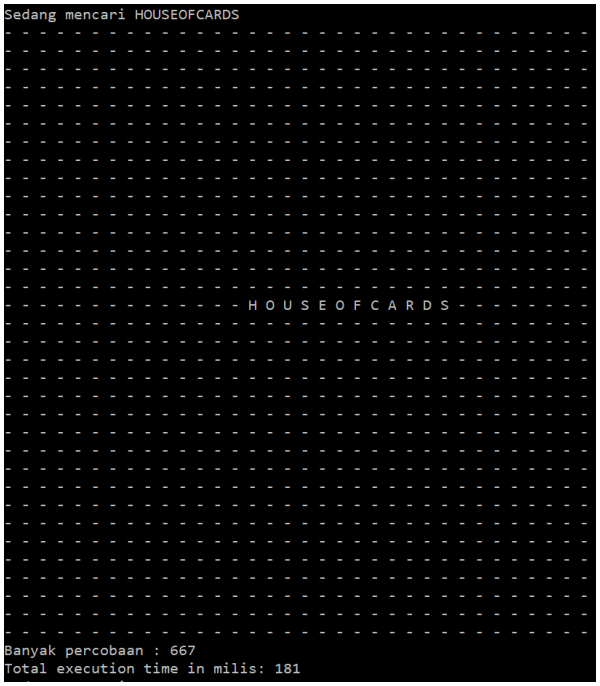


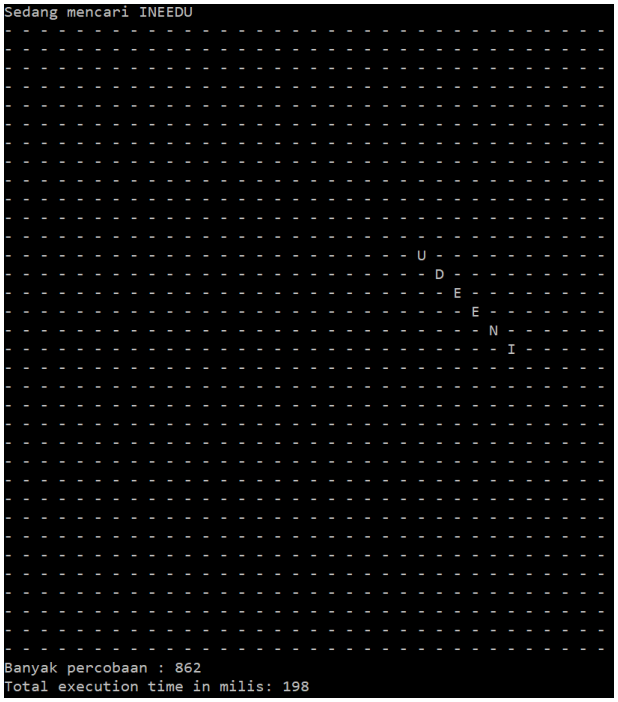

Sedang mencari BESTOFME
E
M
F
O
T
S
E
B
Banyak percobaan : 299
Total execution time in milis: 132
Sedang mencari BLOODSWEATANDTEARS
S R A E T D N A T A E W S D O O L B
Banyak percobaan : 437
Total execution time in milis: 128
Sedang mencari BOYINLUV
V U L N I Y O B
Banyak percobaan : 758
Total execution time in milis: 182
Sedang mencari BUTTERFLY
B
U
T
T
E
R
F
L
Y
Banyak percobaan : 773
Total execution time in milis: 179

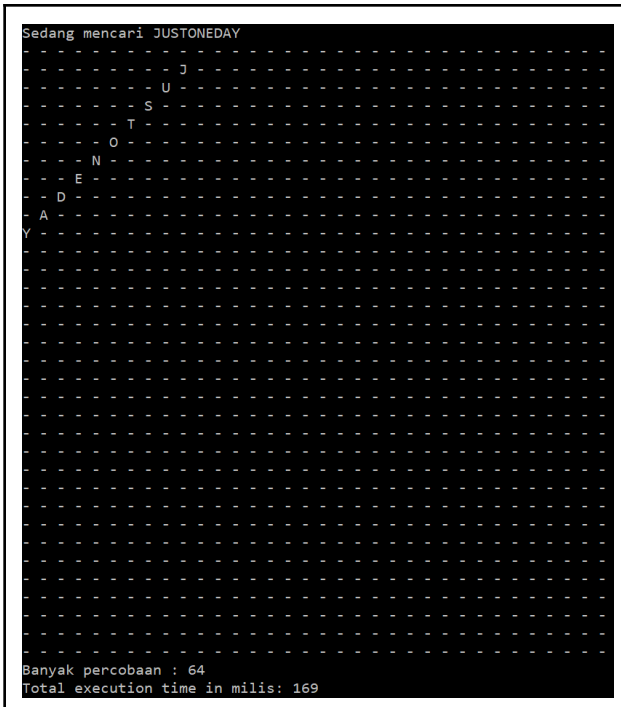

Sedang mencari DANGER
D A N G E R
Banyak percobaan : 570
Total execution time in milis: 179
Sedang mencari DIMPLE
E L P M I D
Banyak percobaan : 16
Total execution time in milis: 179
Sedang mencari DNA
A
N
D
Banyak percobaan : 99
Total execution time in milis: 197
Sedang mencari DOPE
E P O D
Banyak percobaan : 291
Total execution time in milis: 185

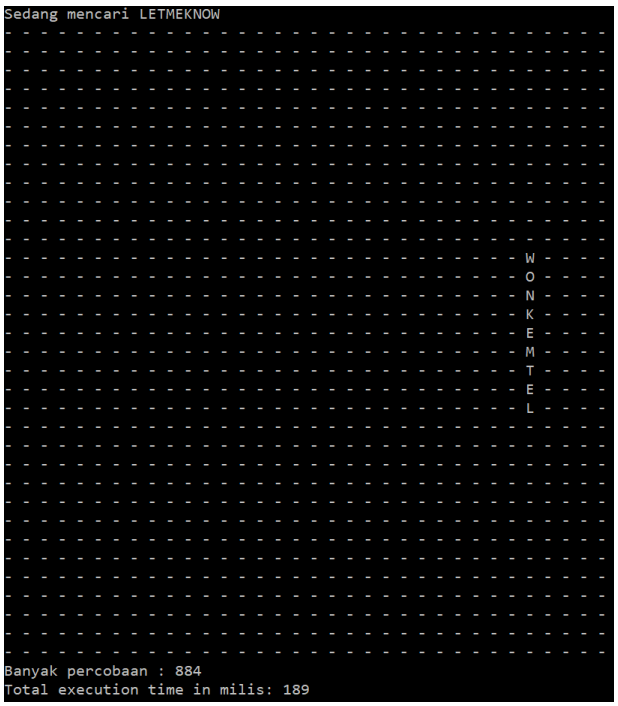

Sedang mencari FIRSTLOVE
F I R S T L O V E
Banyak percobaan : 1322
Total execution time in milis: 156

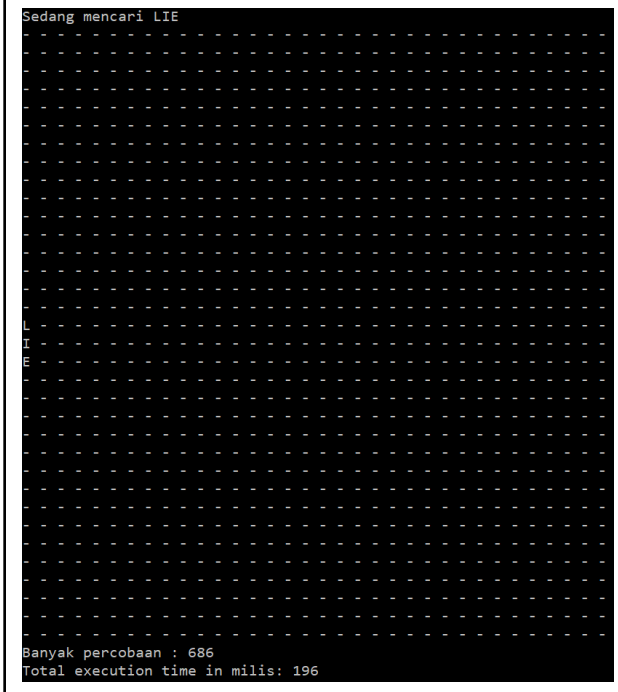

Sedang mencari GOGO
G
O
G
O
Banyak percobaan : 1067
Total execution time in milis: 190

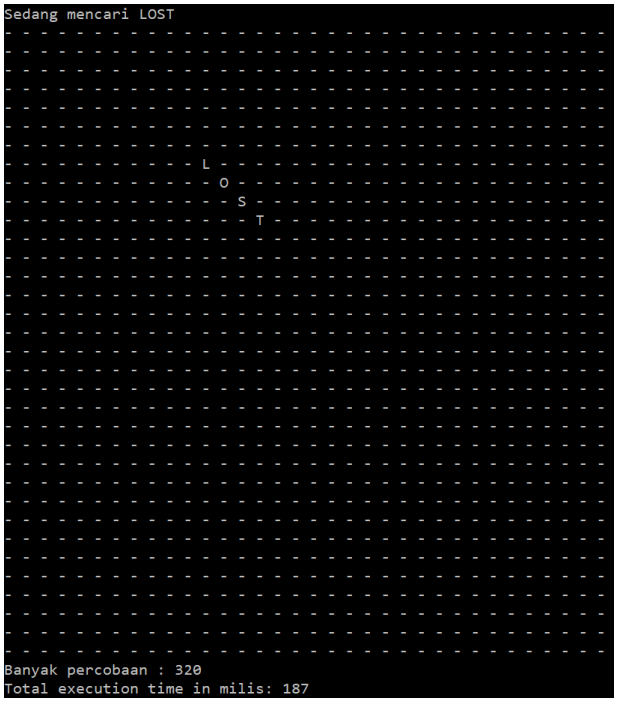

Sedang mencari HOUSEOFCARDS
H O U S E O F C A R D S
Banyak percobaan : 667
Total execution time in milis: 181

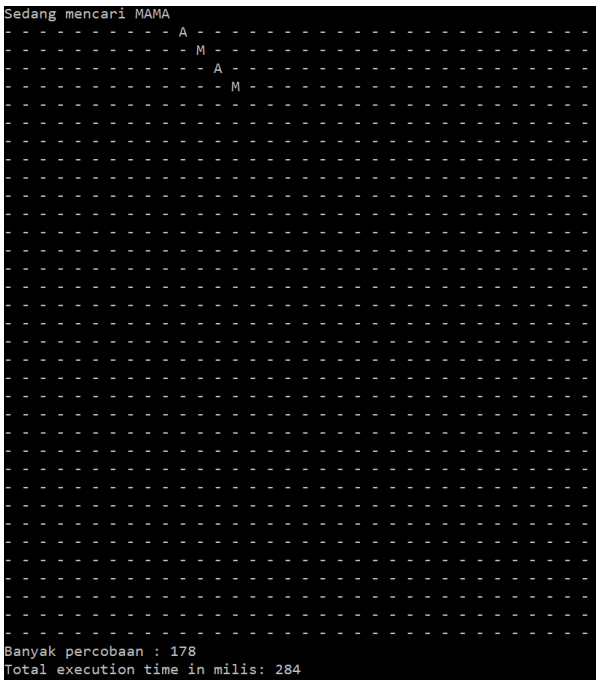

Sedang mencari INEEDU
U
D
E
E
N
I
Banyak percobaan : 862
Total execution time in milis: 198

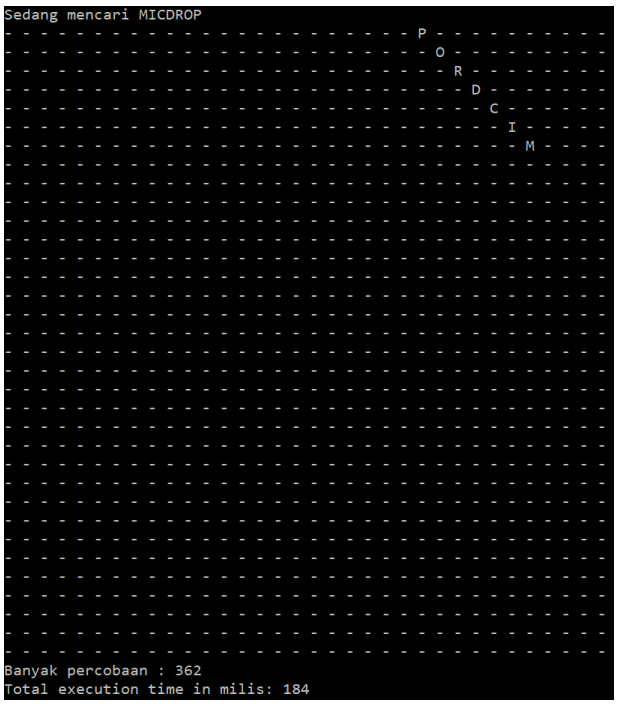

Sedang mencari JUSTONEDAY
Banyak percobaan : 64
Total execution time in milis: 169

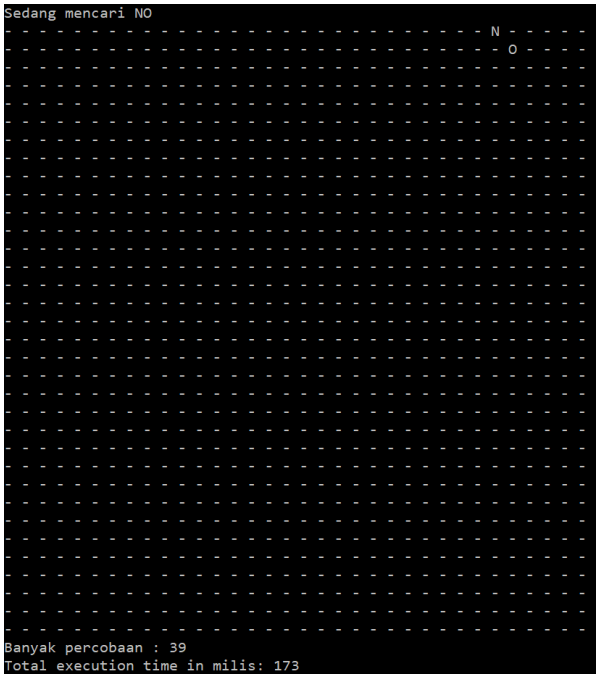

Sedang mencari LETMEKNOW
Banyak percobaan : 884
Total execution time in milis: 189

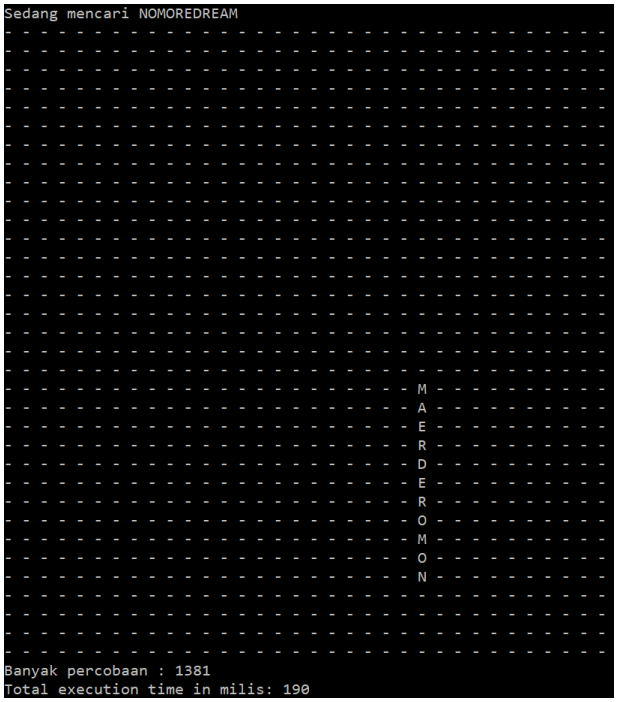

Sedang mencari LIE
Banyak percobaan : 686
Total execution time in milis: 196

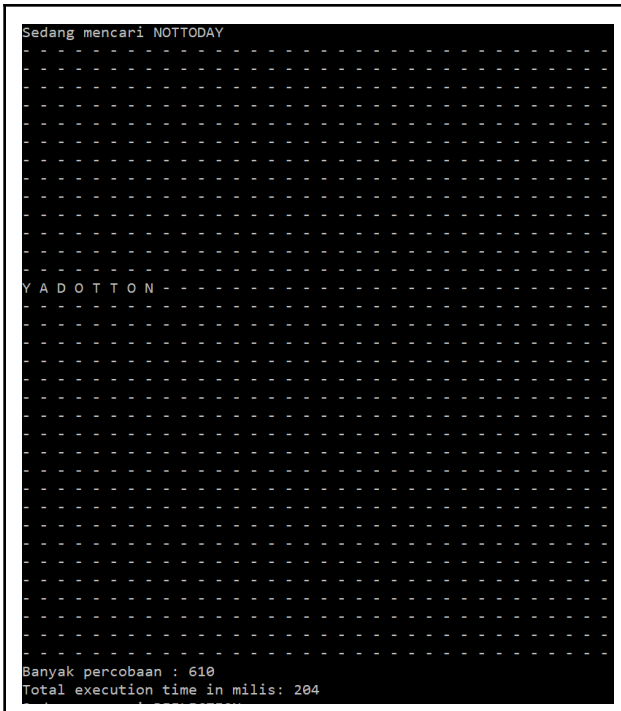

Sedang mencari LOST
Banyak percobaan : 320
Total execution time in milis: 187

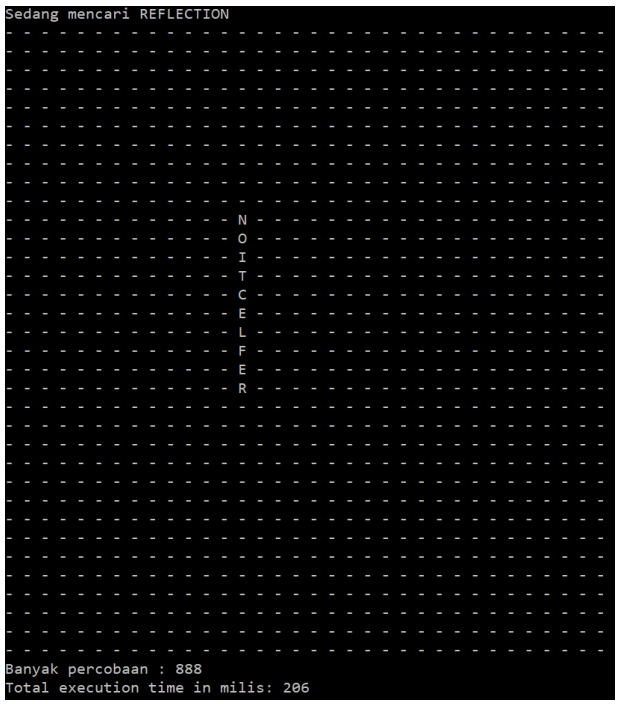

Sedang mencari MAMA
Banyak percobaan : 178
Total execution time in milis: 284

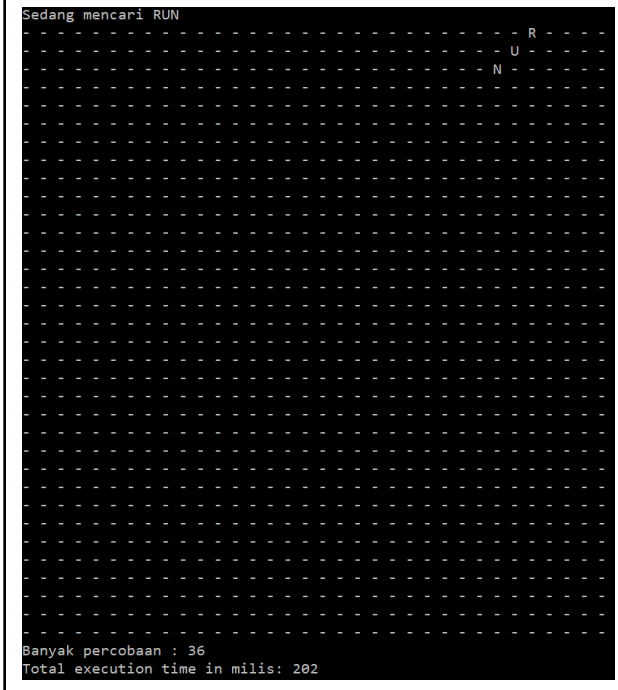

Sedang mencari MICDROP
Banyak percobaan : 362
Total execution time in milis: 184

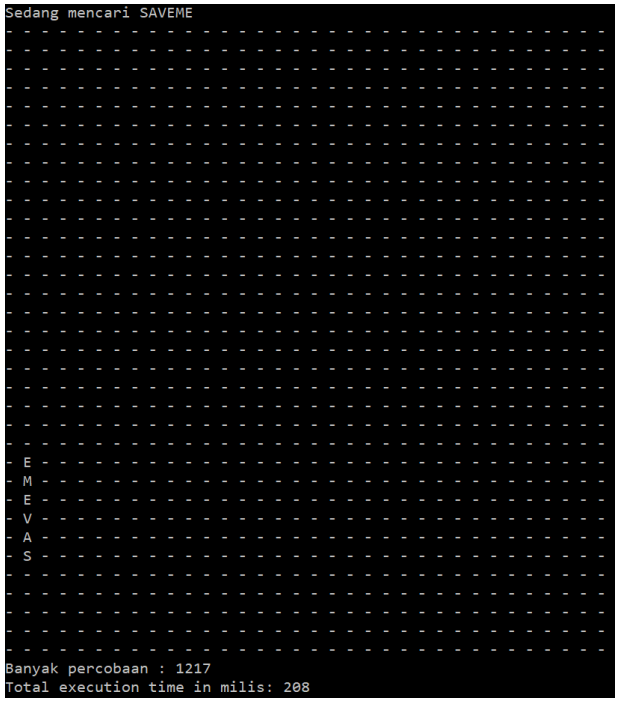

Sedang mencari NO
Banyak percobaan : 39
Total execution time in milis: 173

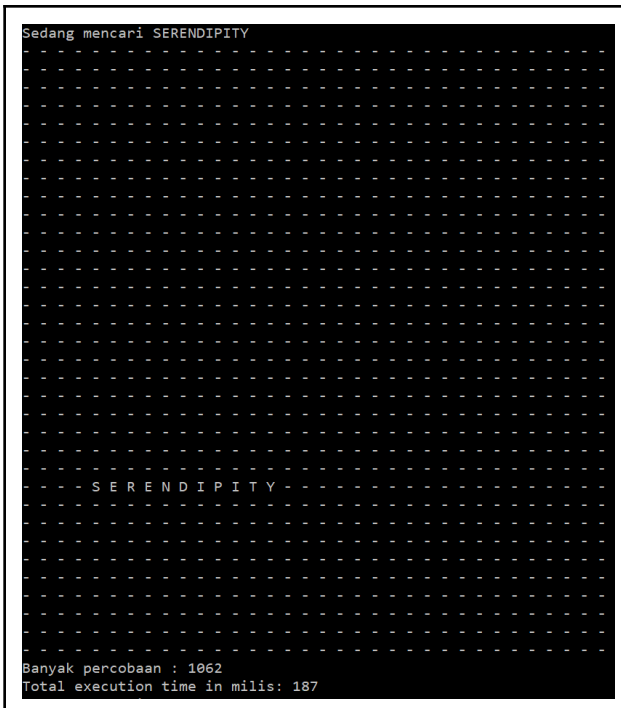

Sedang mencari NOMOREDREAM
Banyak percobaan : 1381
Total execution time in milis: 190

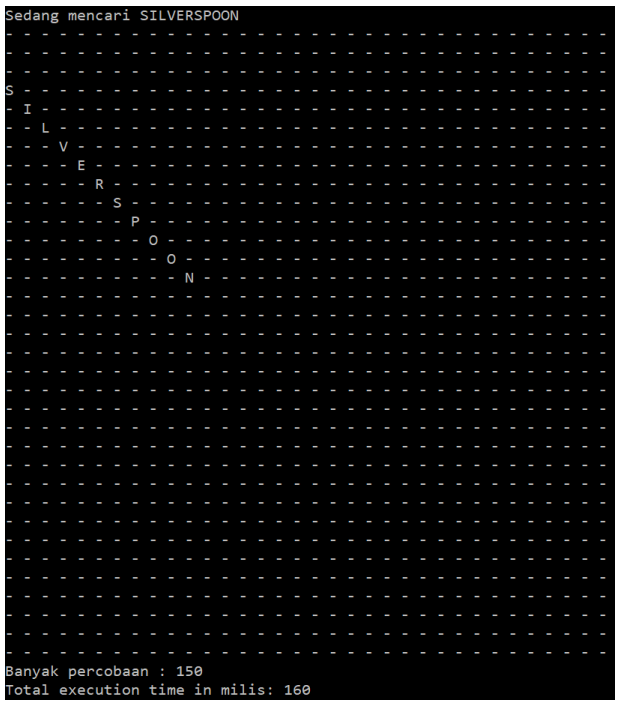

Sedang mencari NOTTODAY
Y A D O T T O N
Banyak percobaan : 610
Total execution time in milis: 204

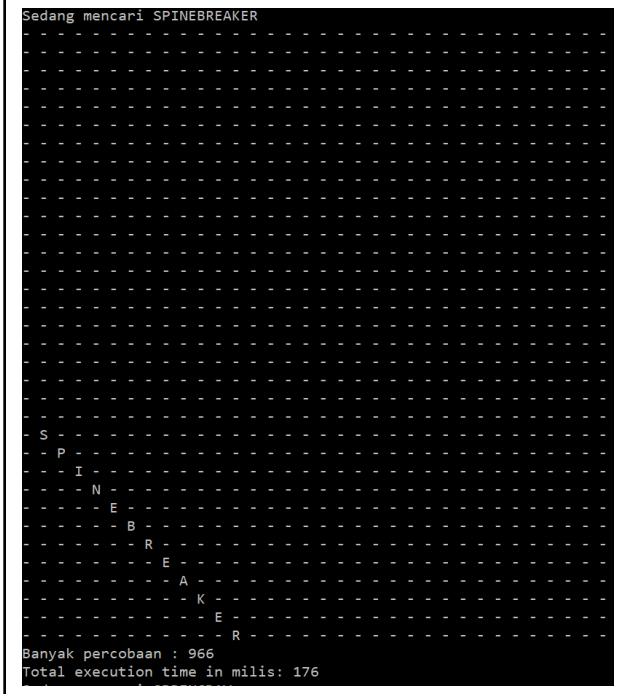

Sedang mencari REFLECTION
N
O
I
T
C
E
L
F
E
R
Banyak percobaan : 888
Total execution time in milis: 206

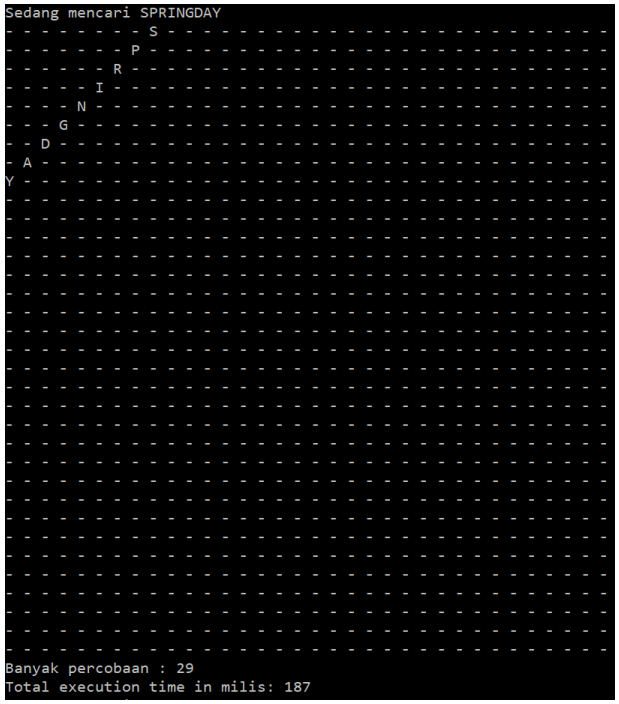

Sedang mencari RUN
R
U
N
Banyak percobaan : 36
Total execution time in milis: 202

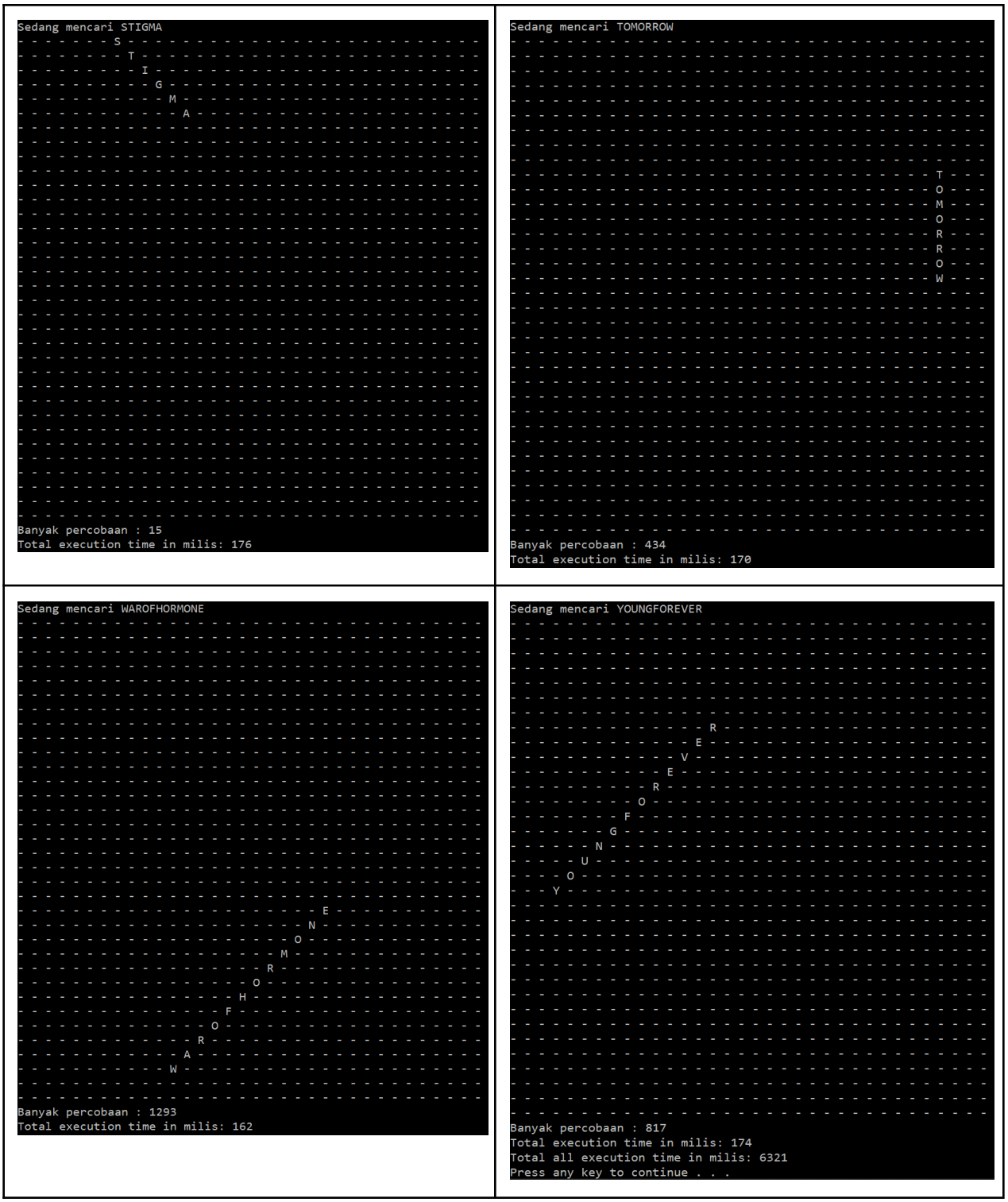

Sedang mencari SAVEME
E
M
E
V
A
S
Banyak percobaan : 1217
Total execution time in milis: 208


Sedang mencari SERENDIPITY
S E R E N D I P I T Y
Banyak percobaan : 1062
Total execution time in milis: 187

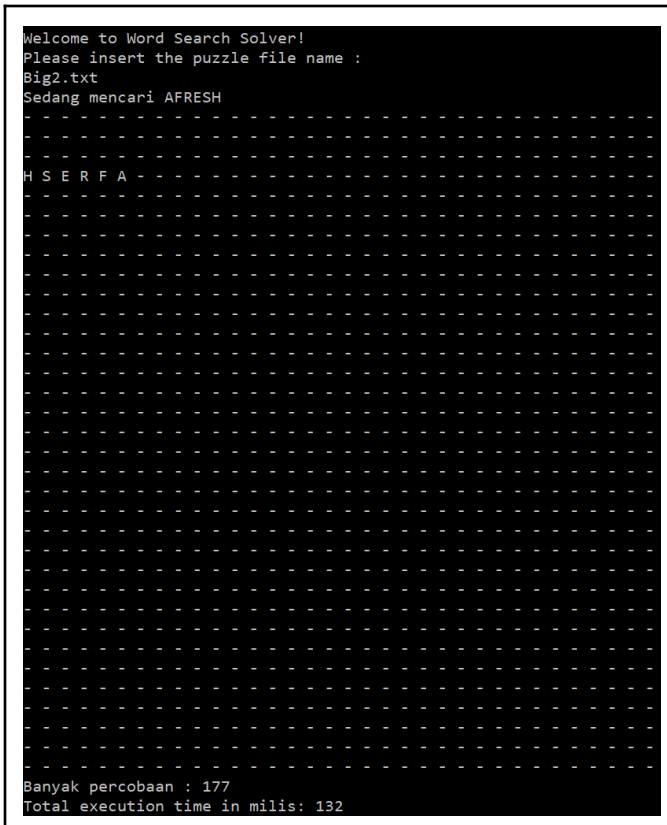

Sedang mencari SILVERSPOON
Banyak percobaan : 150
Total execution time in milis: 160

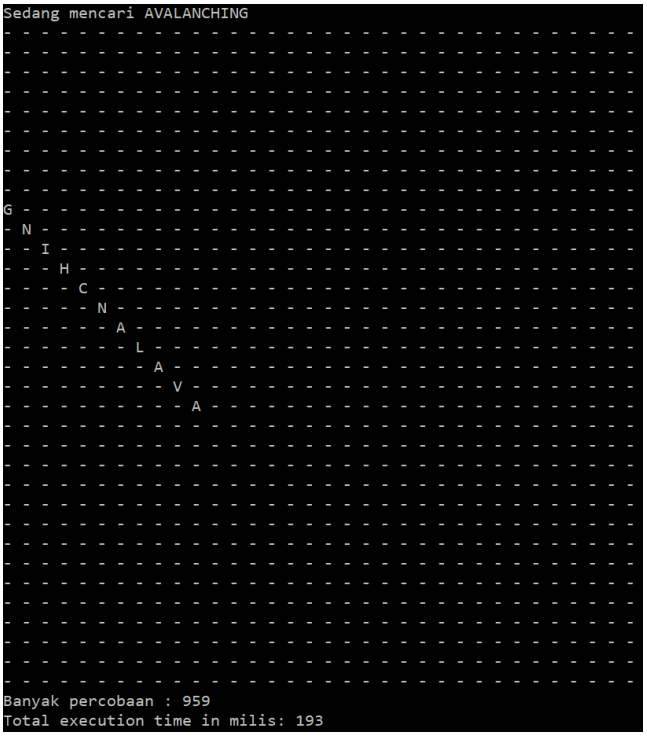

Sedang mencari SPINEBREAKER
Banyak percobaan : 966
Total execution time in milis: 176

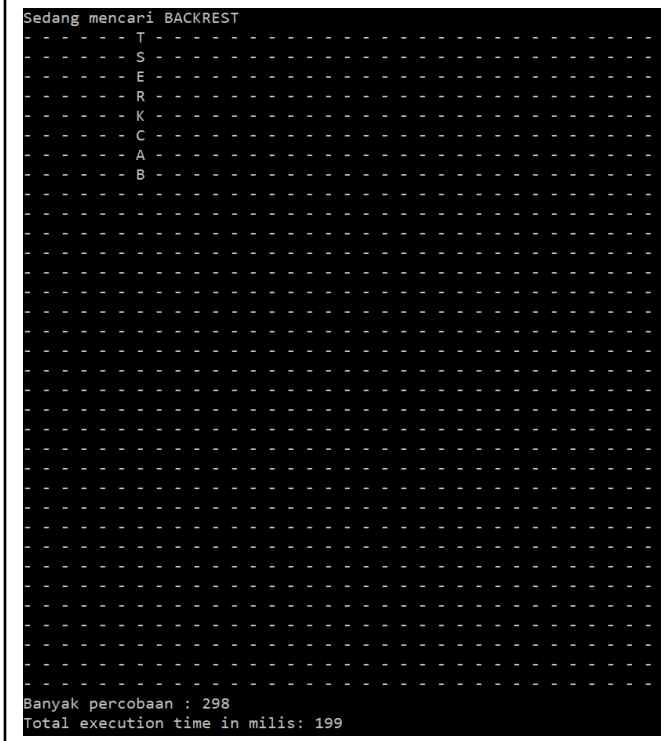

Sedang mencari SPRINGDAY
Banyak percobaan : 29
Total execution time in milis: 187

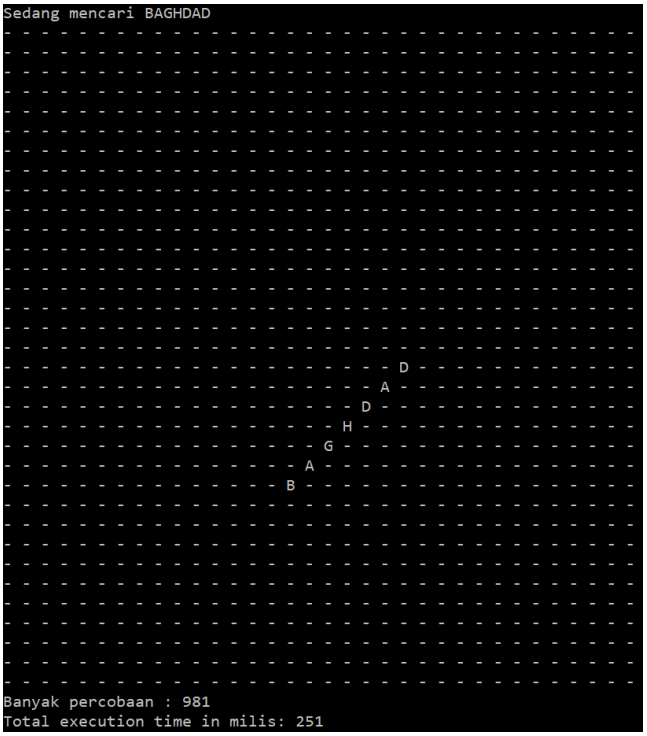


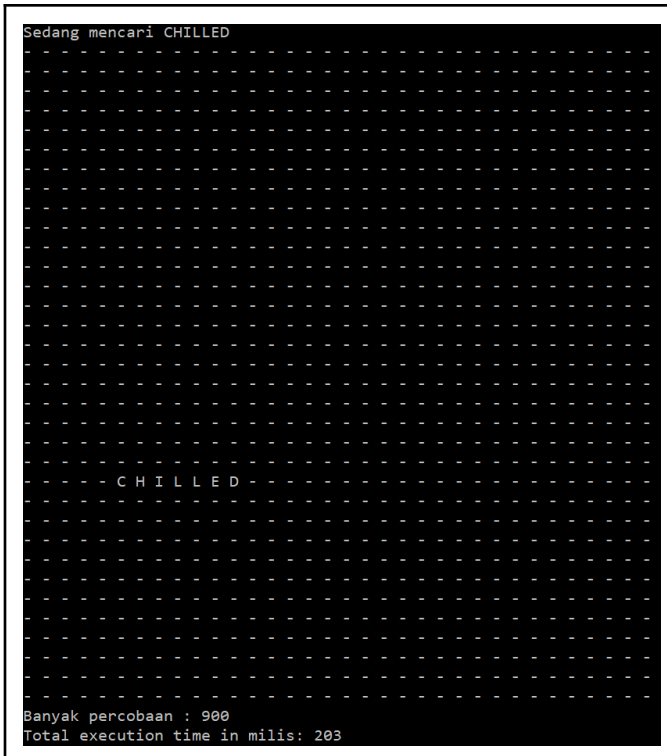
Gambar 2.7 Input dan Output Test Case Big 1

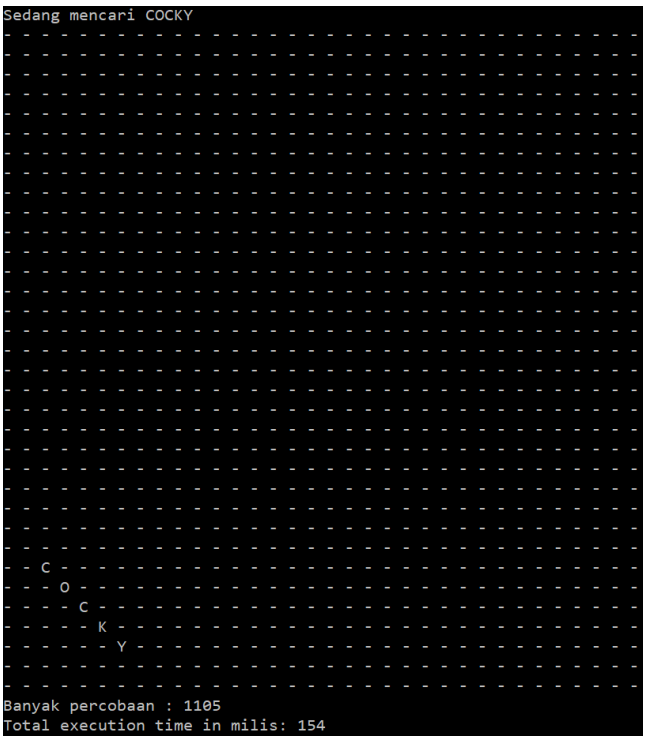

Welcome to Word Search Solver!
Please insert the puzzle file name :
Big2.txt
Sedang mencari AFRESH
H S E R F A
Banyak percobaan : 177
Total execution time in milis: 132

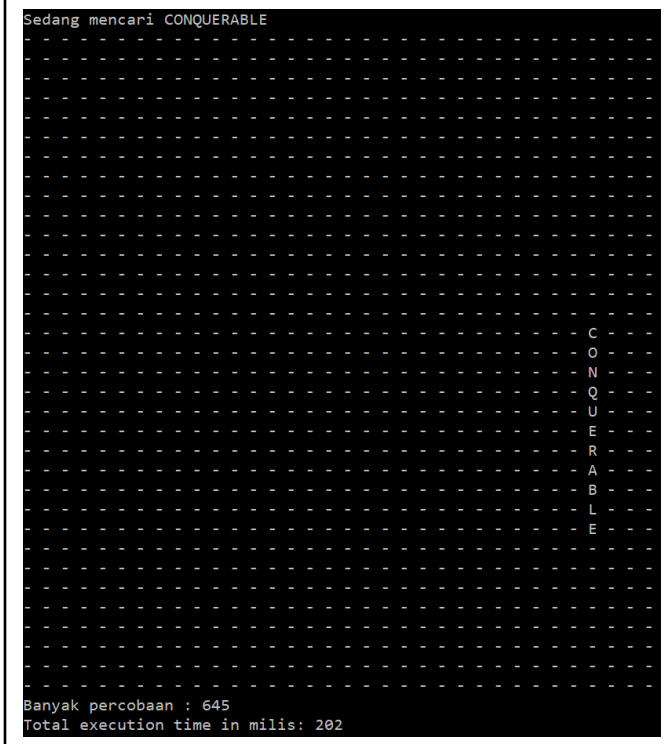

Sedang mencari AVALANCHING
Banyak percobaan : 959
Total execution time in milis: 193

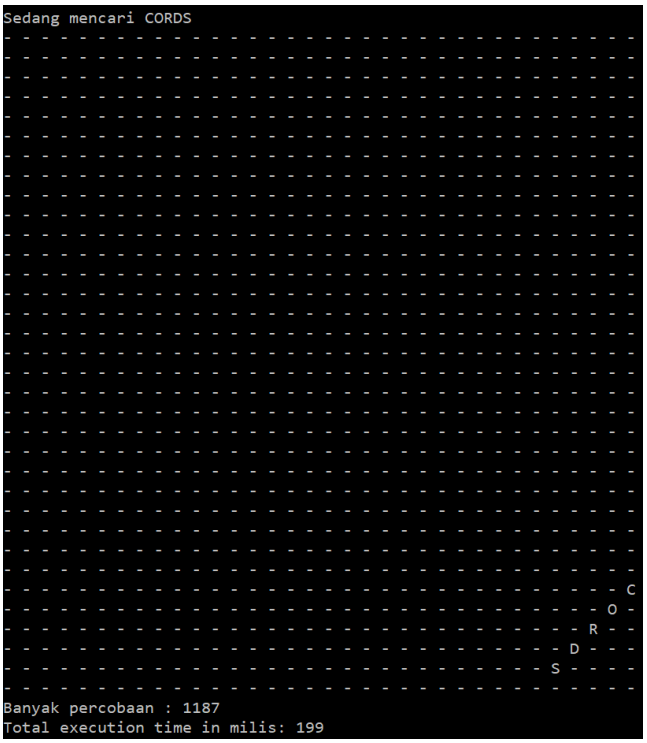

Sedang mencari BACKREST
Banyak percobaan : 298
Total execution time in milis: 199

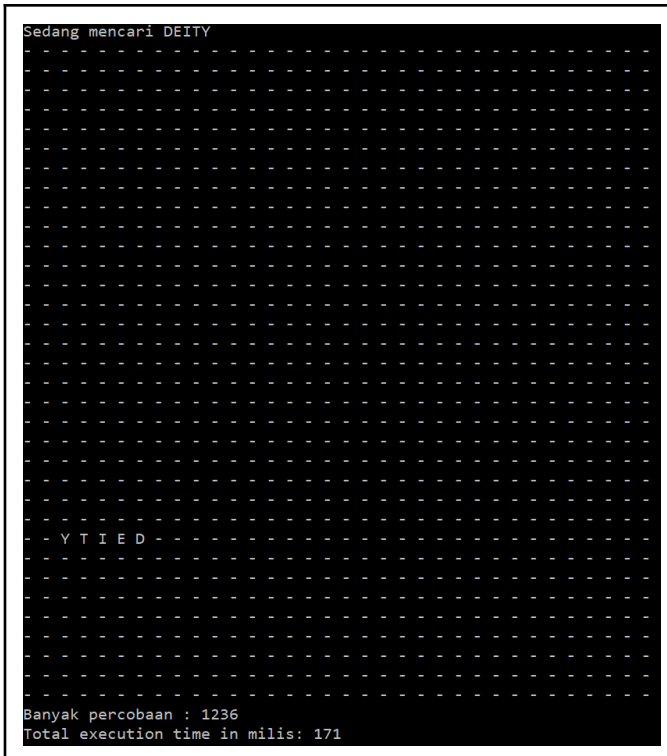

Sedang mencari BAGHDAD
Banyak percobaan : 981
Total execution time in milis: 251

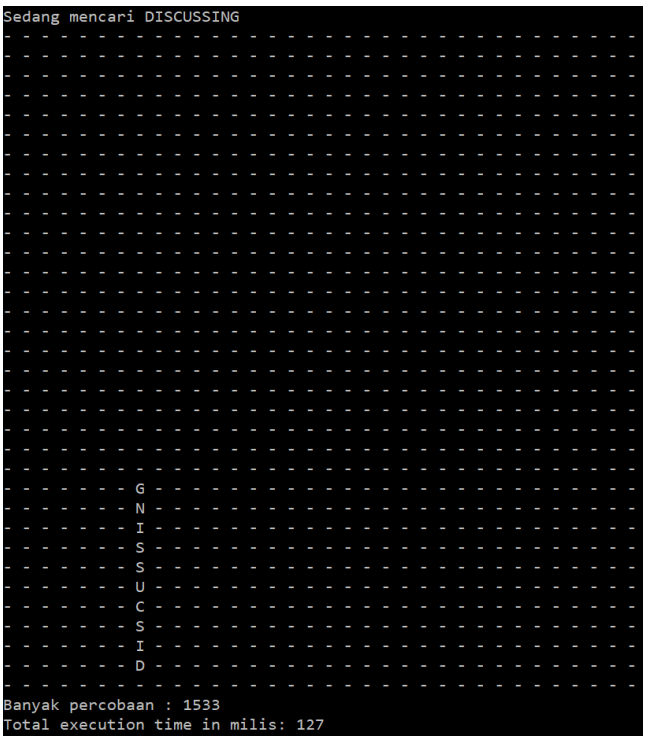

Sedang mencari CHILLED
C H I L L E D
Banyak percobaan : 900
Total execution time in milis: 203

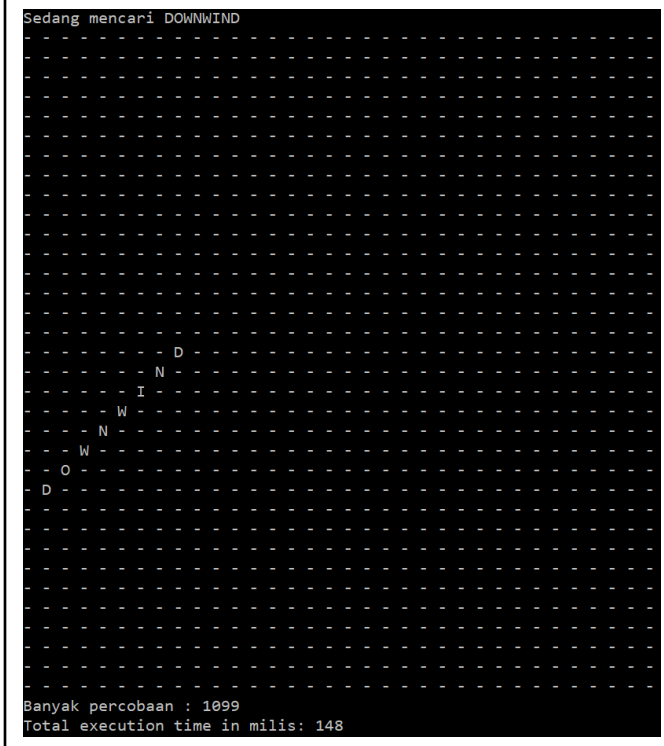

Sedang mencari COCKY
C
O
C
K
Y
Banyak percobaan : 1105
Total execution time in milis: 154

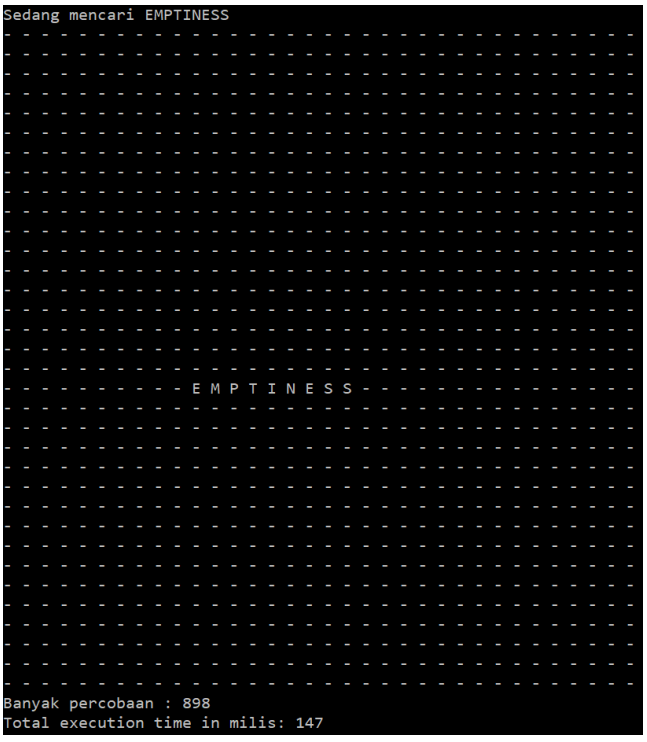

Sedang mencari CONQUERABLE
C O N Q U E R A B L E
Banyak percobaan : 645
Total execution time in milis: 202

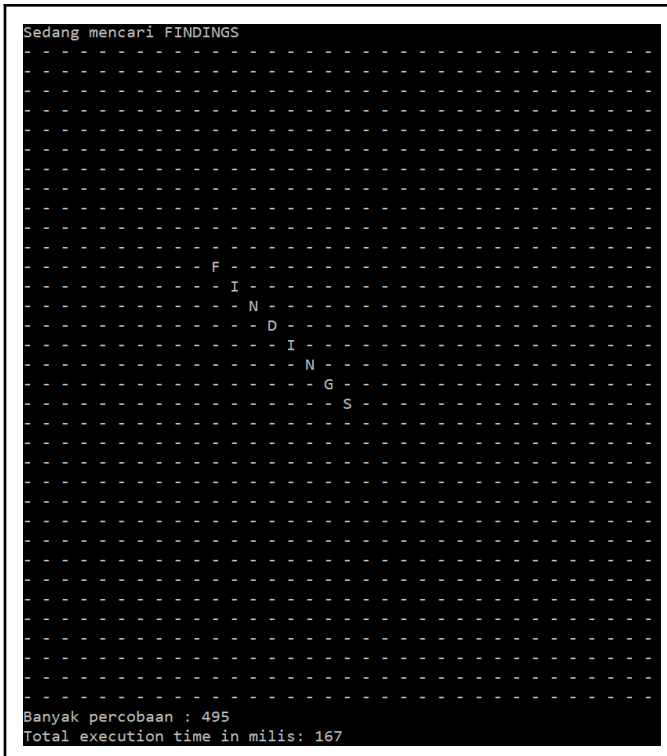

Sedang mencari CORDS
C
O
R
D
S
Banyak percobaan : 1187
Total execution time in milis: 199

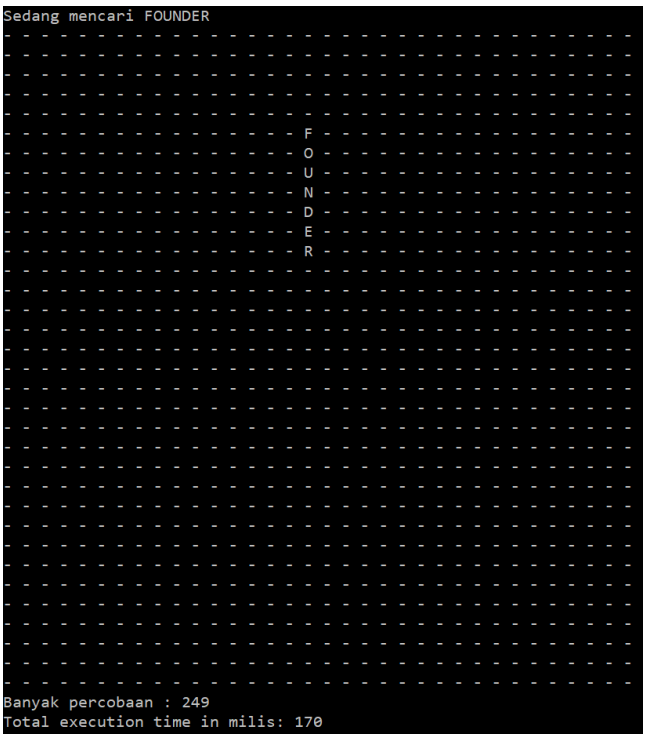

Sedang mencari DEITY
Y T I E D
Banyak percobaan : 1236
Total execution time in milis: 171

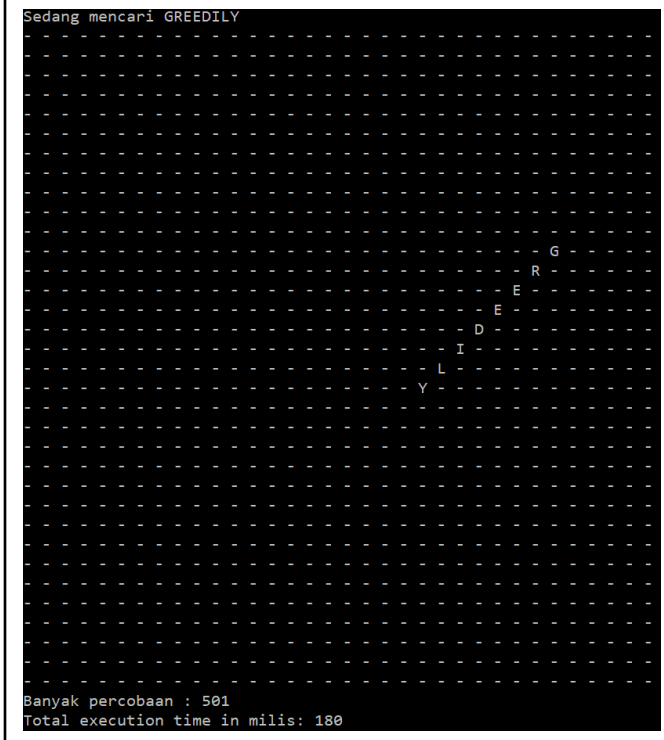

Sedang mencari DISCUSSING
G
N
I
S
S
U
C
S
I
D
Banyak percobaan : 1533
Total execution time in milis: 127

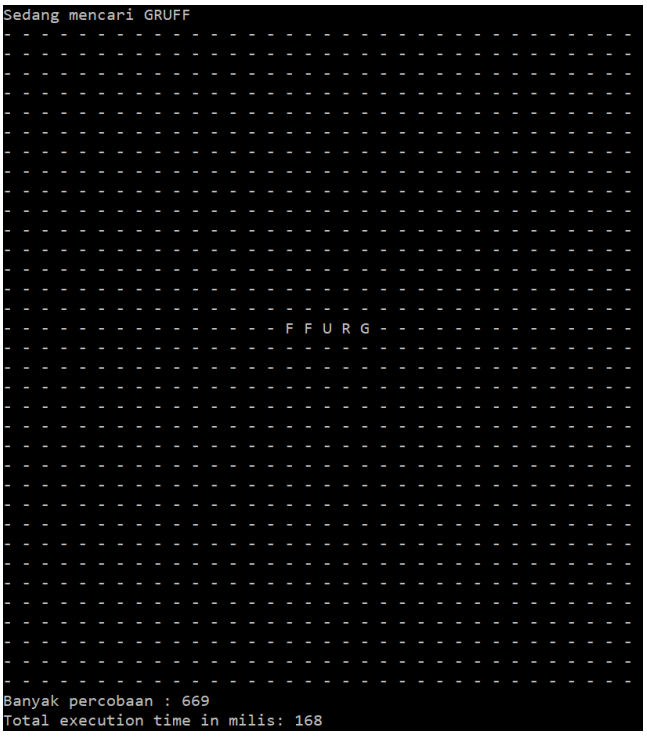

Sedang mencari DOWNWIND
D
N
I
W
N
W
O
D
Banyak percobaan : 1099
Total execution time in milis: 148

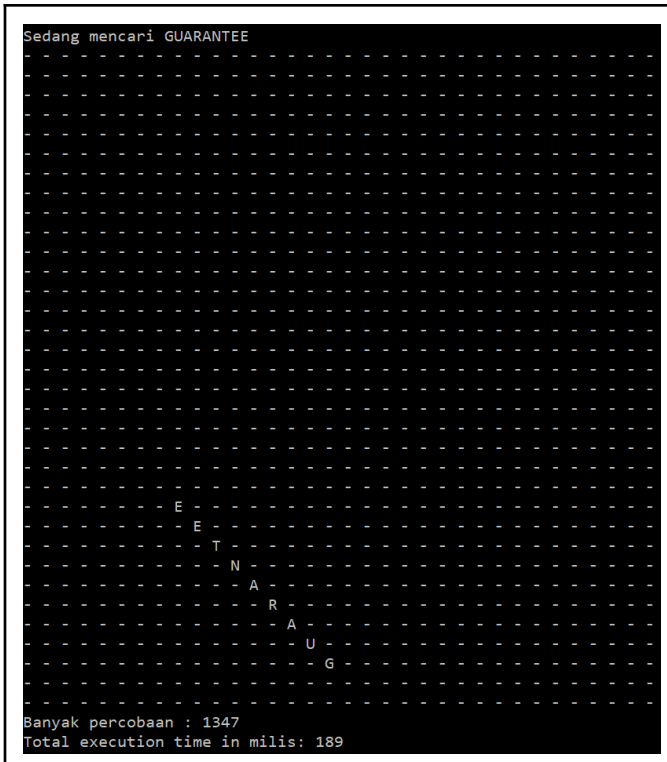

Sedang mencari EMPTINESS
E M P T I N E S S
Banyak percobaan : 898
Total execution time in milis: 147

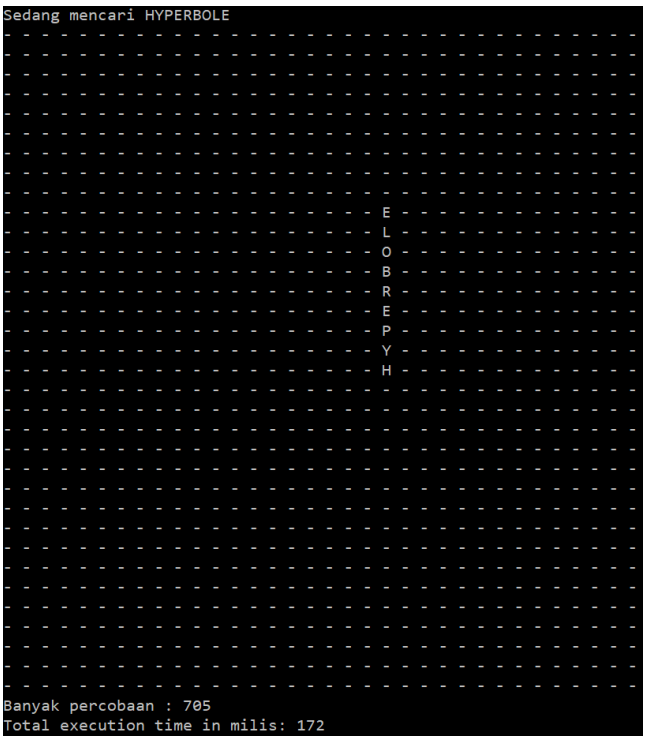

Sedang mencari FINDINGS
Banyak percobaan : 495
Total execution time in milis: 167

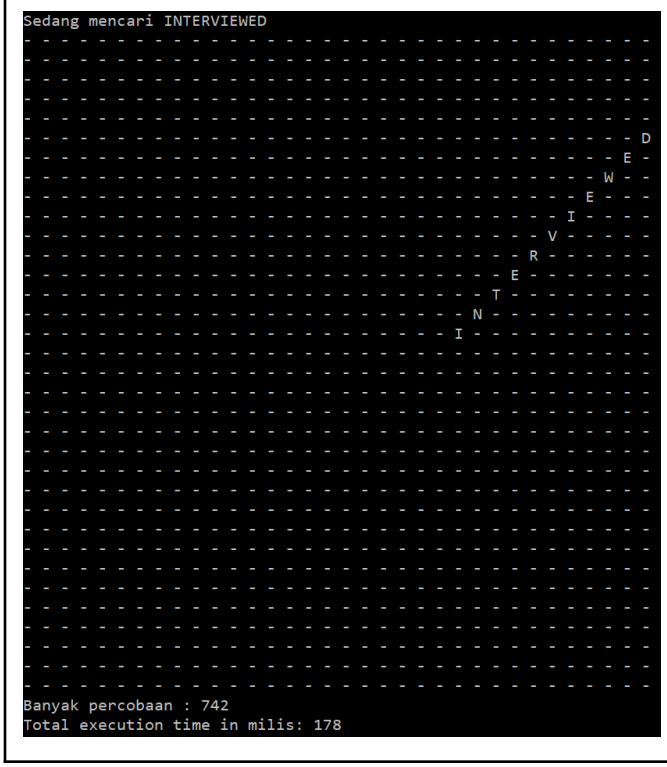

Sedang mencari FOUNDER
Banyak percobaan : 249
Total execution time in milis: 170

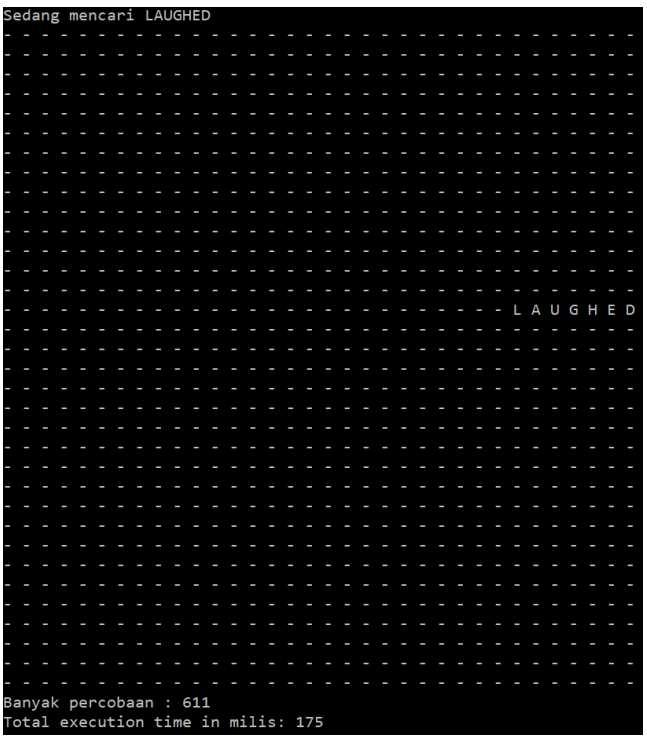

Sedang mencari GREEDILY
Banyak percobaan : 501
Total execution time in milis: 180

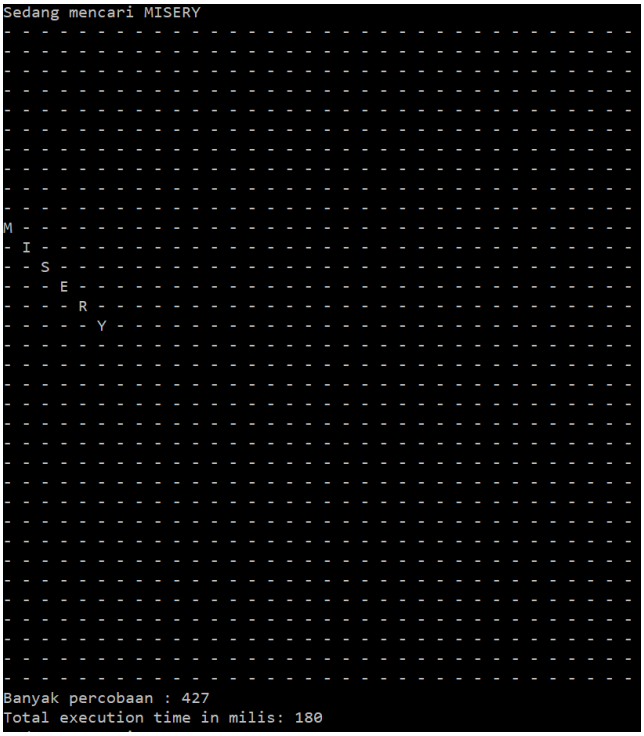

Sedang mencari GRUFF
Banyak percobaan : 669
Total execution time in milis: 168

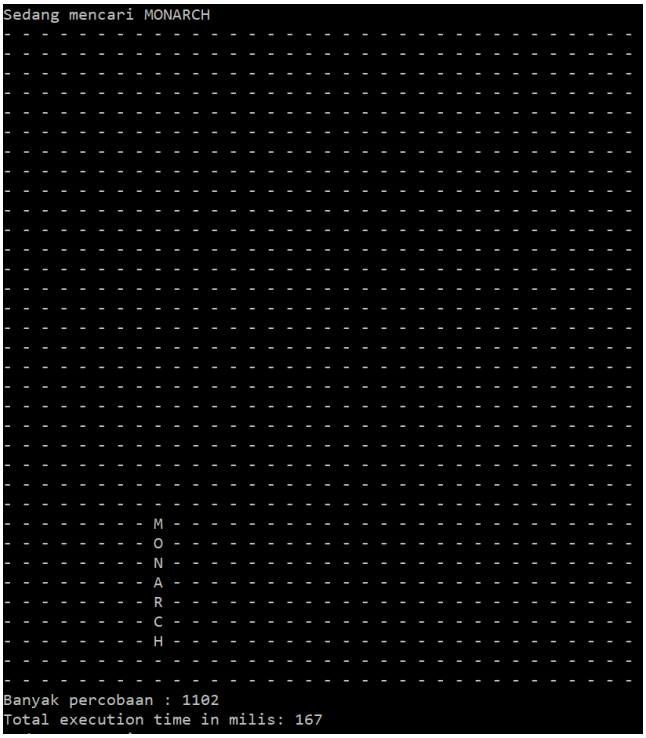

Sedang mencari GUARANTEE
Banyak percobaan : 1347
Total execution time in milis: 189

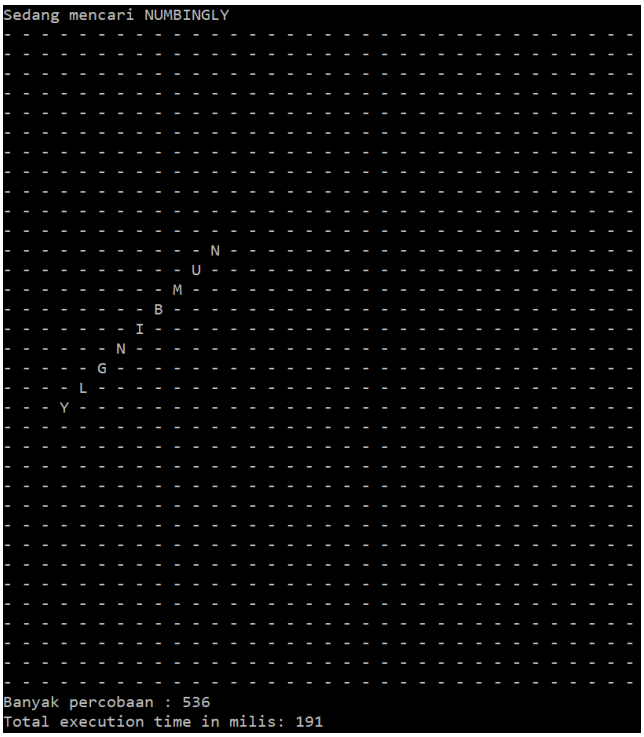

Sedang mencari HYPERBOLE
Banyak percobaan : 705
Total execution time in milis: 172

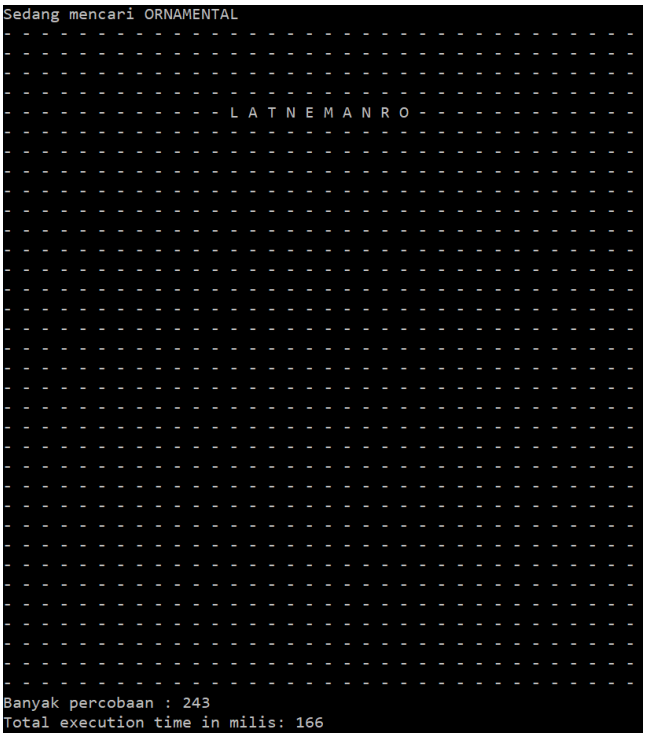

Sedang mencari INTERVIEWED
Banyak percobaan : 742
Total execution time in milis: 178

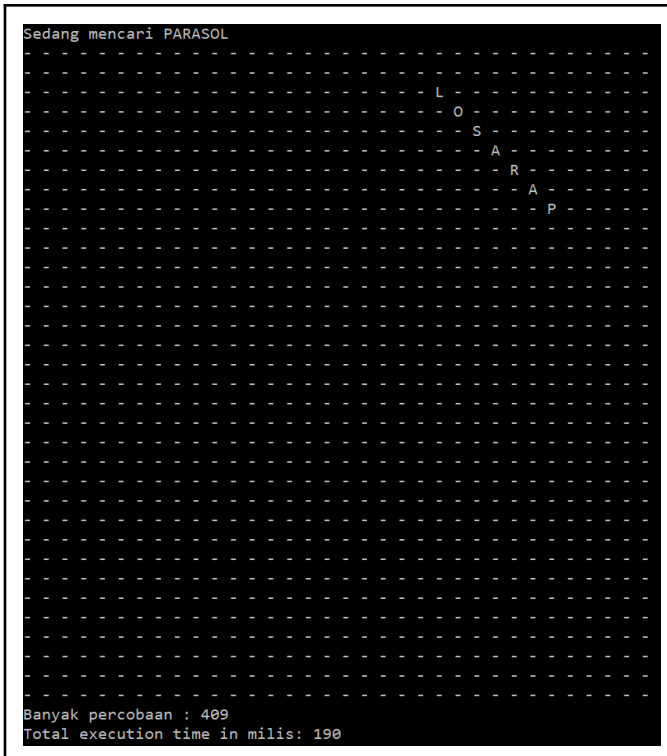

Sedang mencari LAUGHED
Banyak percobaan : 611
Total execution time in milis: 175

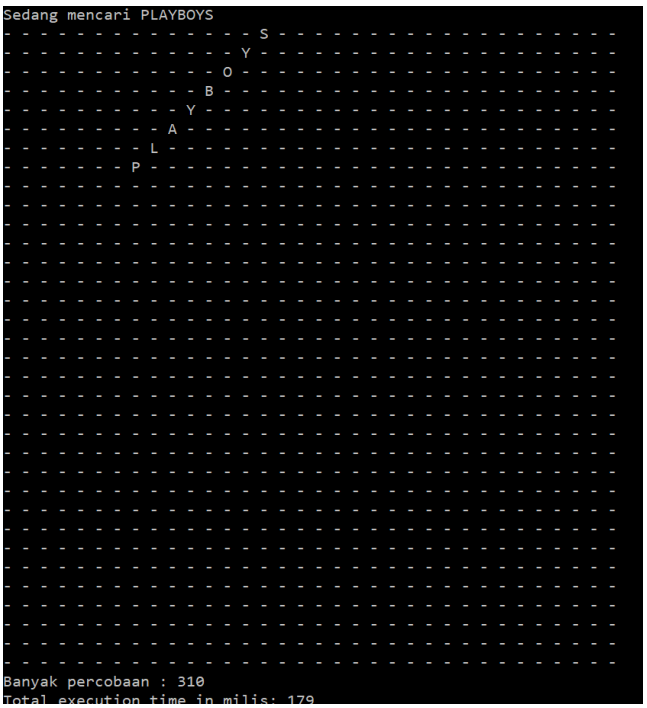

Sedang mencari MISERY
Banyak percobaan : 427
Total execution time in milis: 180

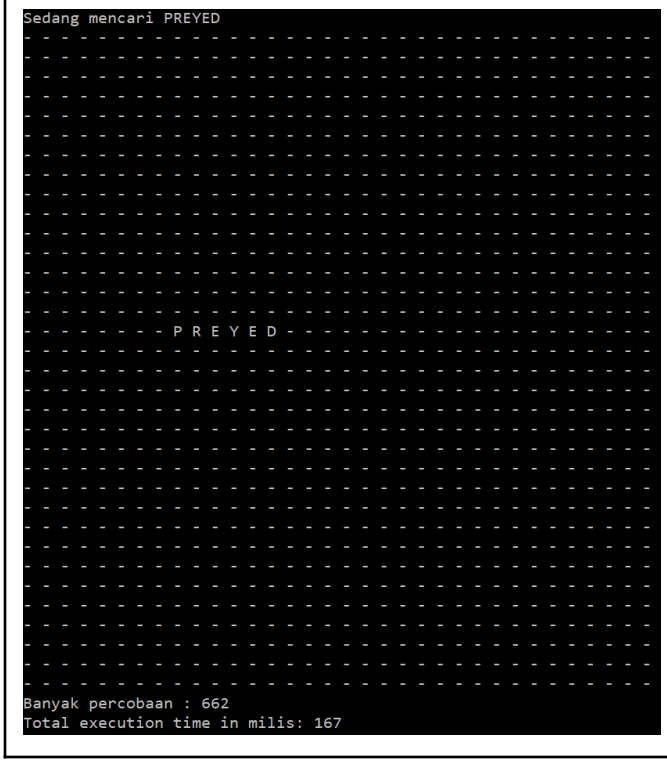

Sedang mencari MONARCH
Banyak percobaan : 1102
Total execution time in milis: 167

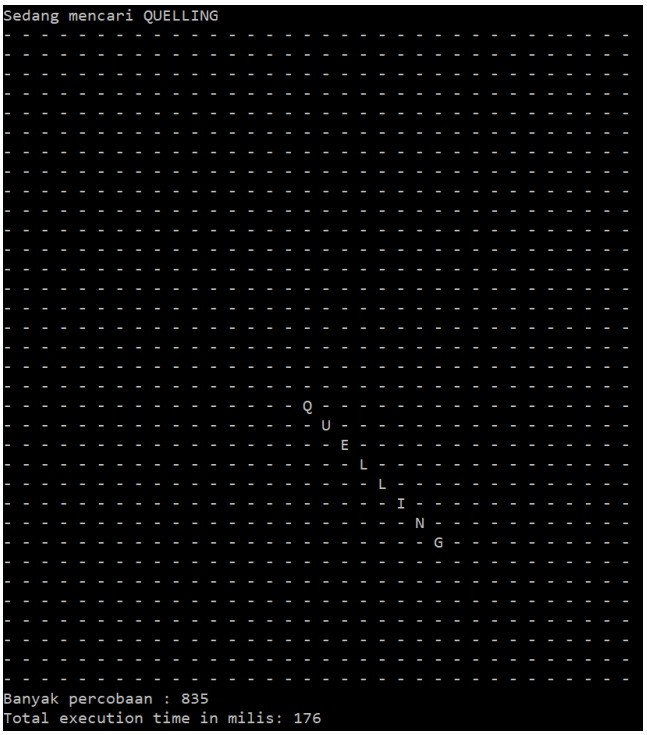

Sedang mencari NUMBINGLY
Banyak percobaan : 536
Total execution time in milis: 191

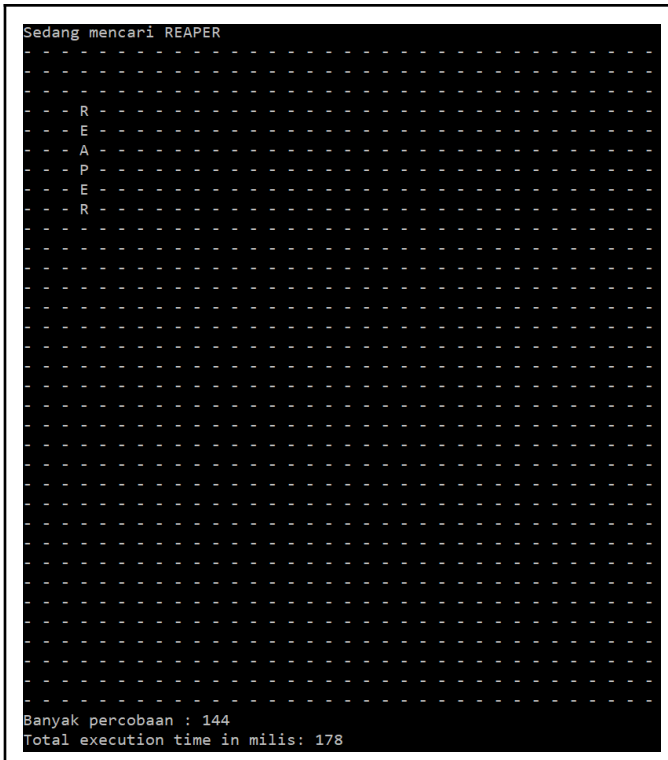

Sedang mencari ORNAMENTAL
Banyak percobaan : 243
Total execution time in milis: 166

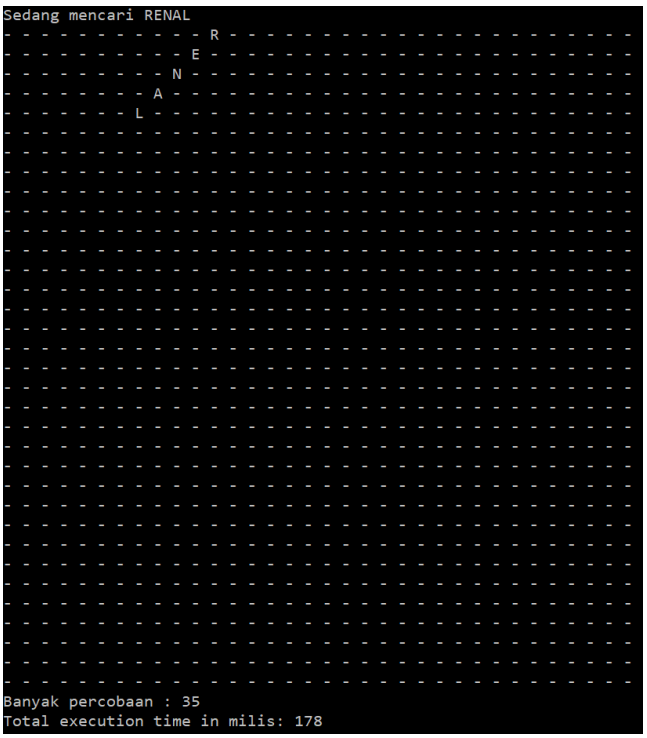

Sedang mencari PARASOL
Banyak percobaan : 409
Total execution time in milis: 190

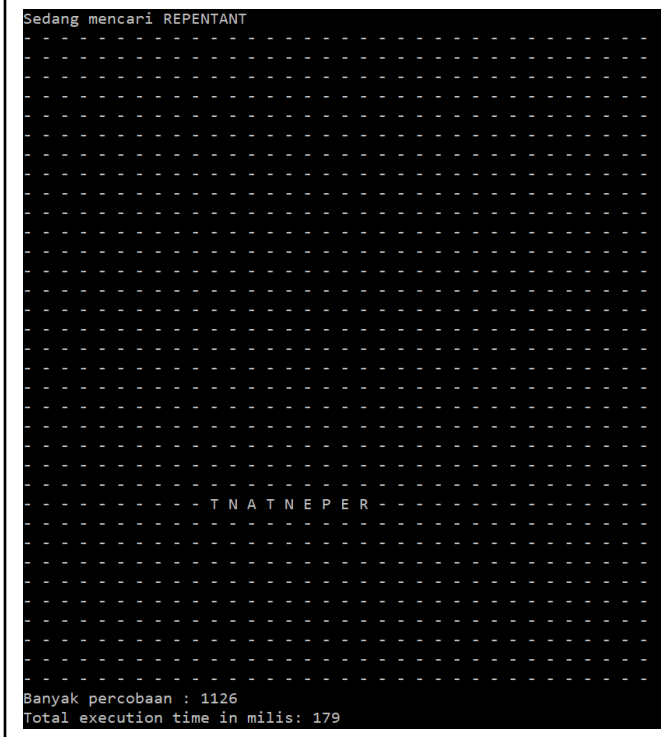

Sedang mencari PLAYBOYS
Banyak percobaan : 310
Total execution time in milis: 179

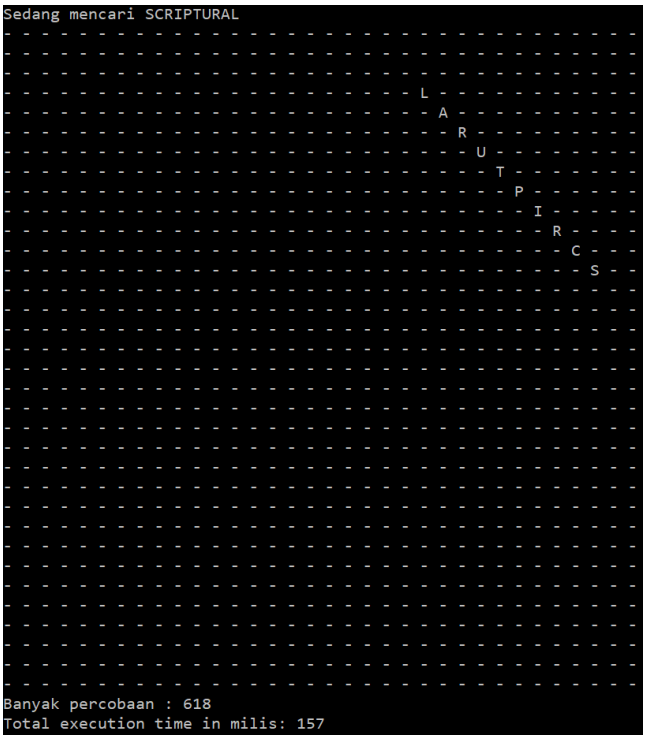

Sedang mencari PREYED
P R E Y E D
Banyak percobaan : 662
Total execution time in milis: 167

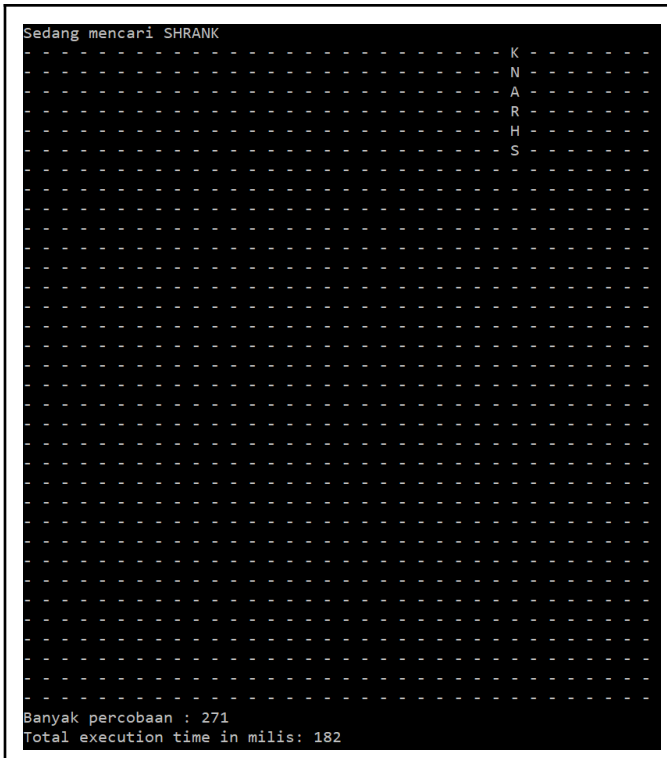

Sedang mencari QUELLING
Banyak percobaan : 835
Total execution time in milis: 176

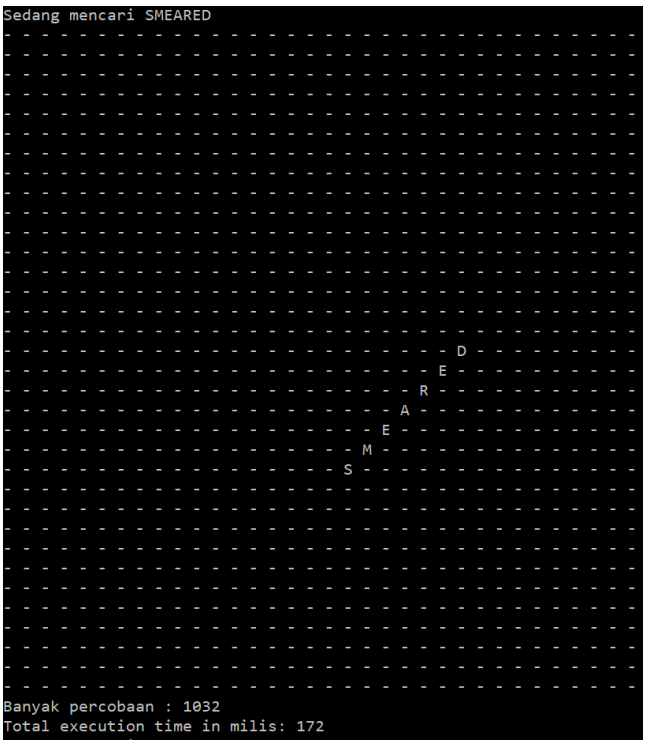

Sedang mencari REAPER
Banyak percobaan : 144
Total execution time in milis: 178

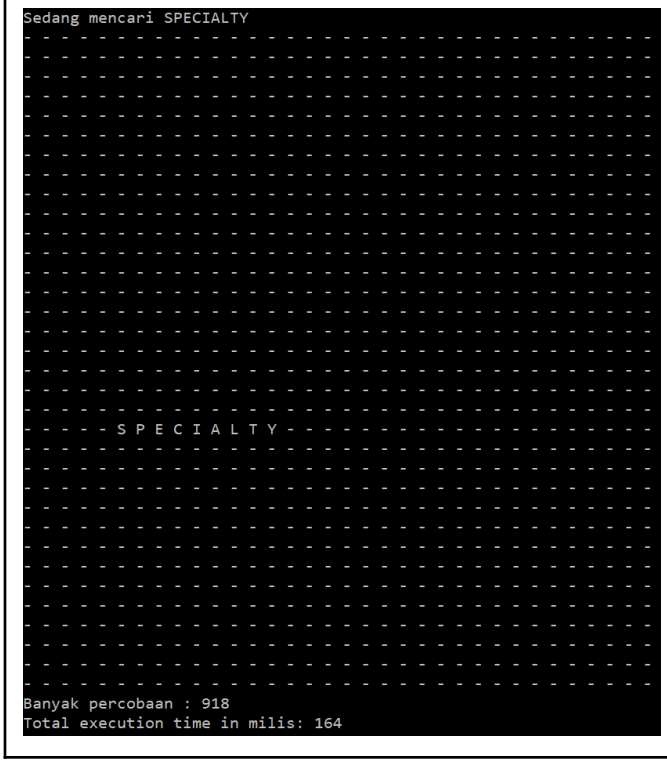

Sedang mencari RENAL
Banyak percobaan : 35
Total execution time in milis: 178

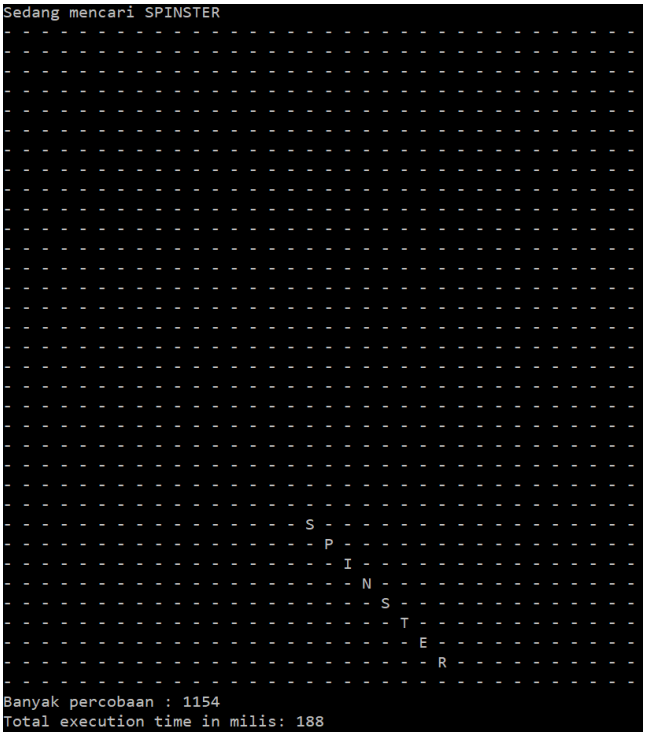

Sedang mencari REPENTANT
T N A T N E P E R
Banyak percobaan : 1126
Total execution time in milis: 179

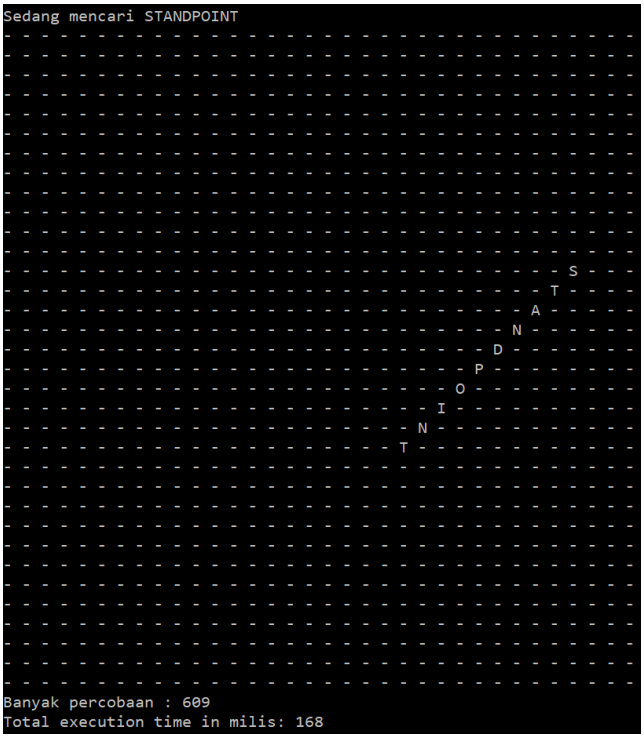

Sedang mencari SCRIPTURAL
Banyak percobaan : 618
Total execution time in milis: 157

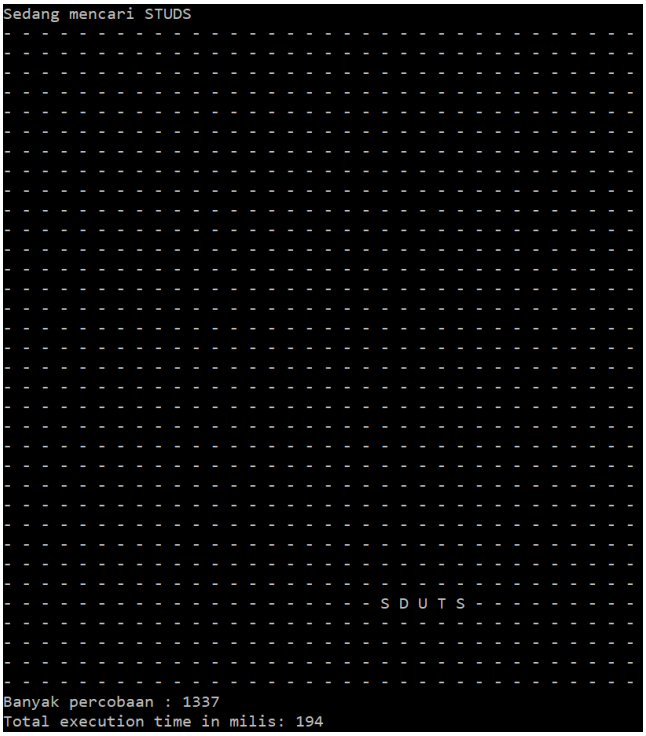

Sedang mencari SHRANK
K
N
A
R
H
S
Banyak percobaan : 271
Total execution time in milis: 182

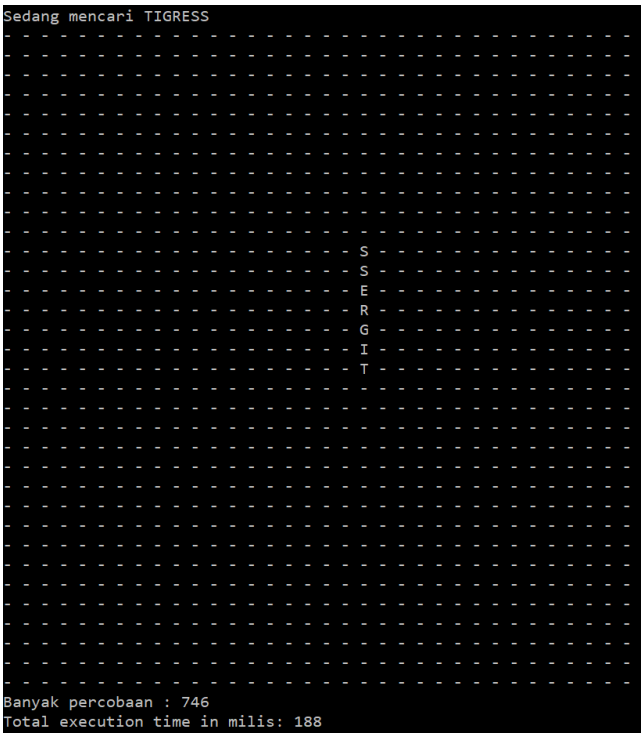

Sedang mencari SMEARED
D
E
R
A
E
M
S
Banyak percobaan : 1032
Total execution time in milis: 172

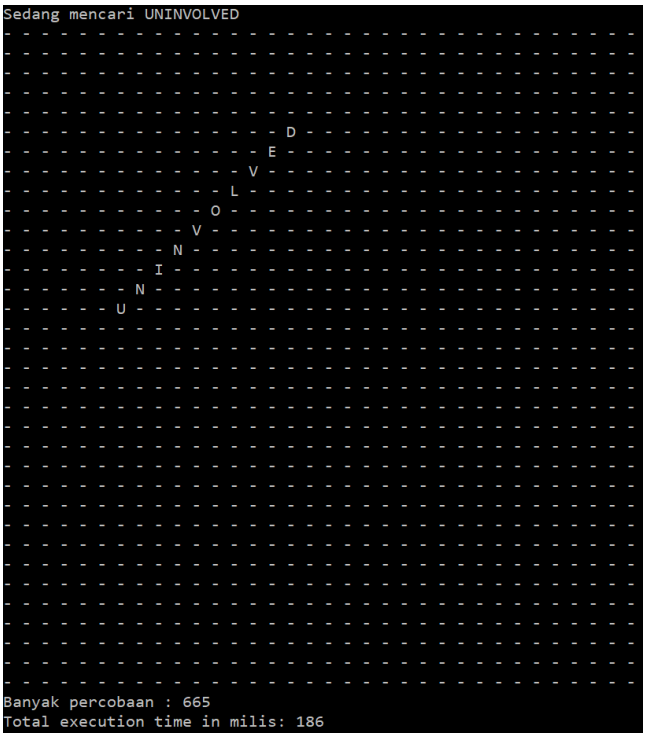

Sedang mencari SPECIALTY
S P E C I A L T Y
Banyak percobaan : 918
Total execution time in milis: 164

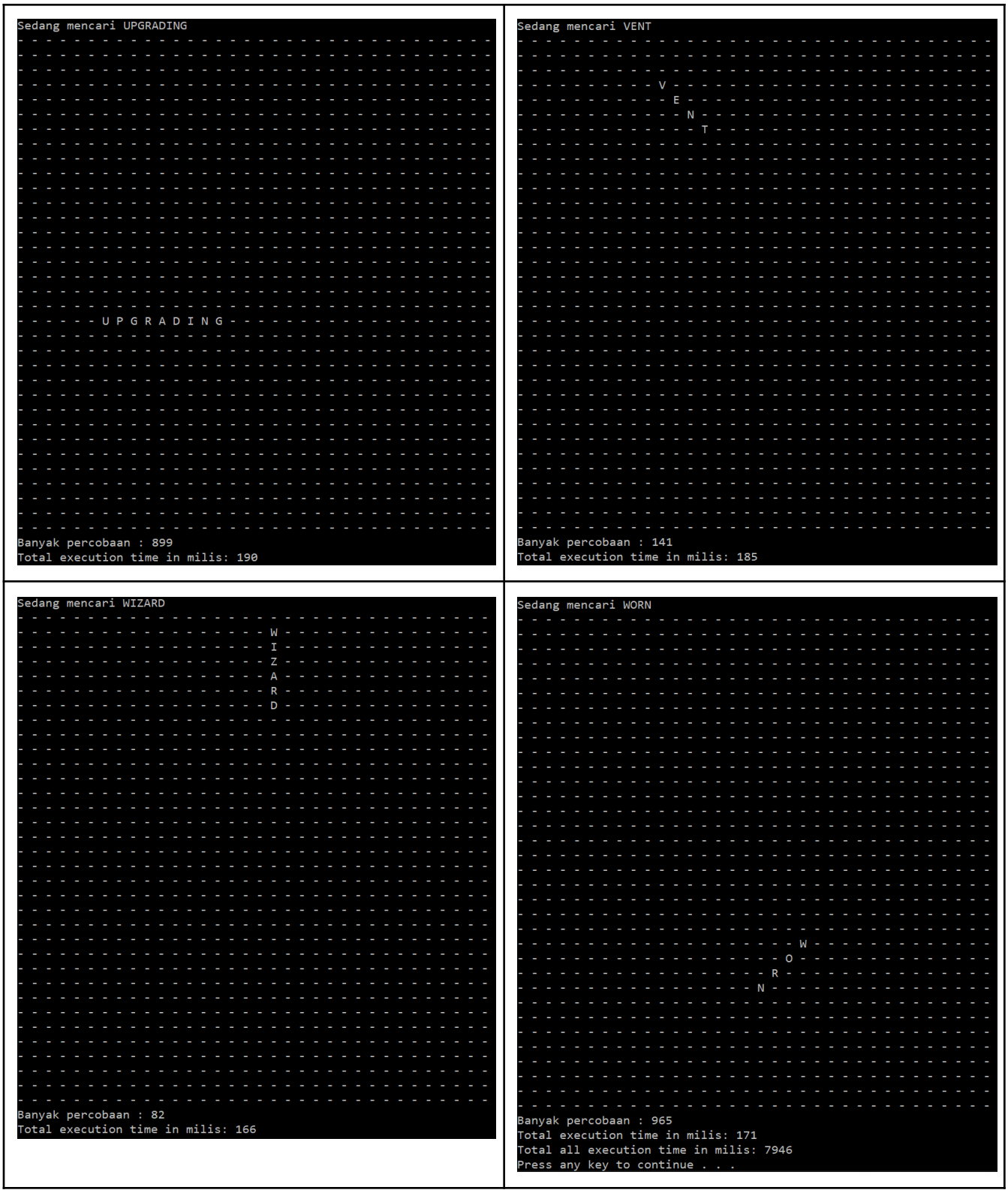

Sedang mencari SPINSTER
S
P
I
N
S
T
E
R
Banyak percobaan : 1154
Total execution time in milis: 188


Sedang mencari STANDPOINT
Banyak percobaan : 609
Total execution time in milis: 168


Sedang mencari STUDS
Banyak percobaan : 1337
Total execution time in milis: 194

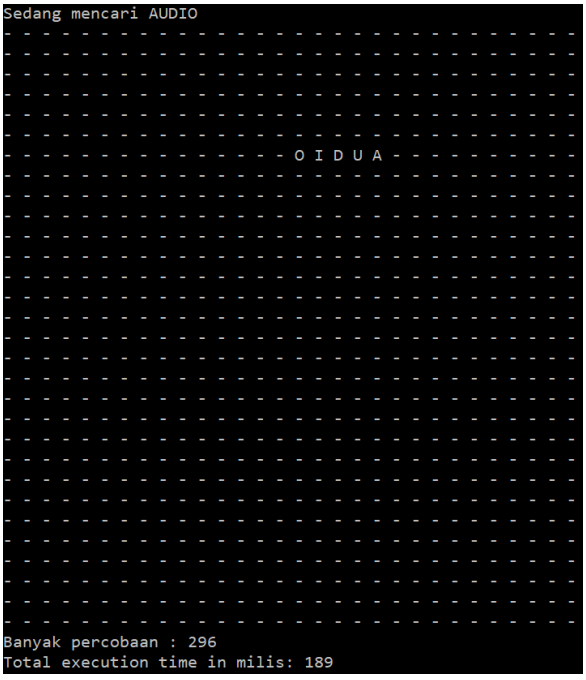

Sedang mencari TIGRESS
Banyak percobaan : 746
Total execution time in milis: 188

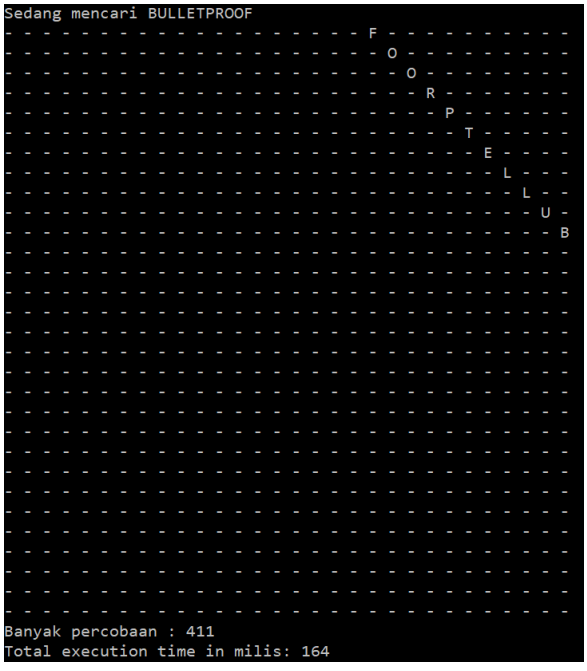

Sedang mencari UNINVOLVED
Banyak percobaan : 665
Total execution time in milis: 186

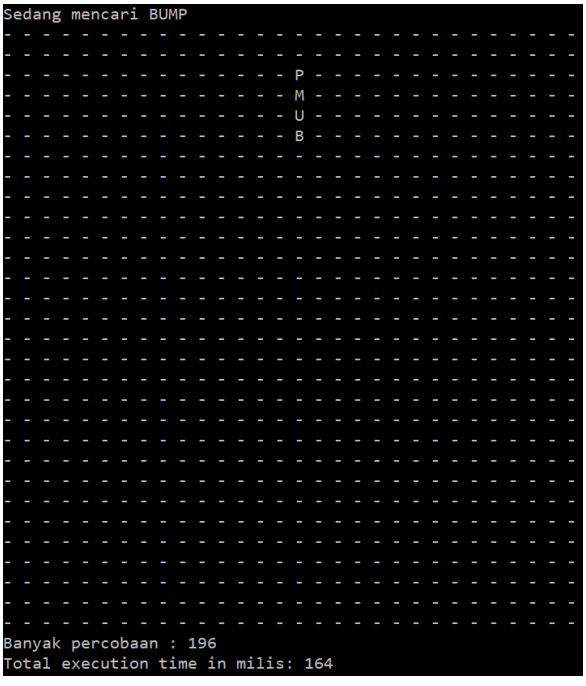


Gambar 2.8 Input dan Output Test Case Big 2

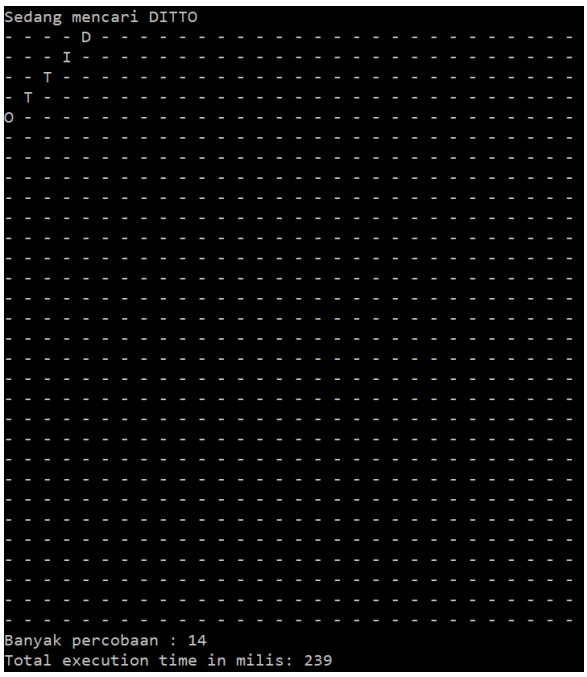

Welcome to Word Search Solver!
Please insert the puzzle file name :
Big3.txt
Sedang mencari ABOUNDED
Total execution time in milis: 18
Sedang mencari ACTRESS
Banyak percobaan : 677
Total execution time in milis: 124

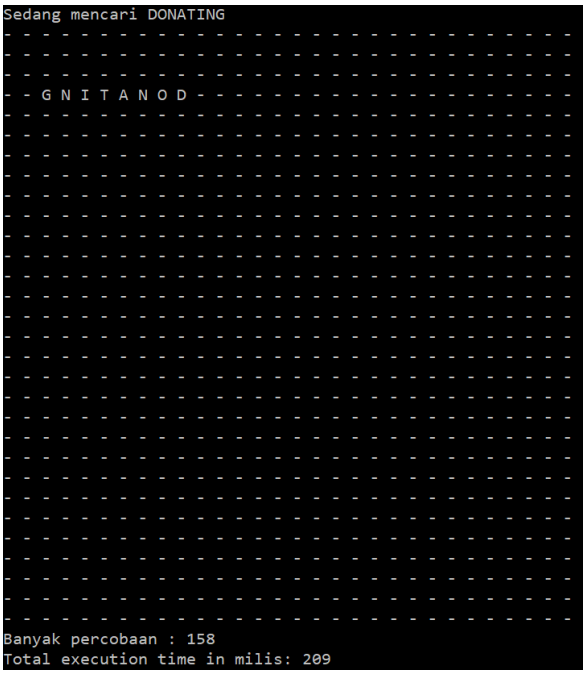

Sedang mencari AUDIO
O I D U A
Banyak percobaan : 296
Total execution time in milis: 189

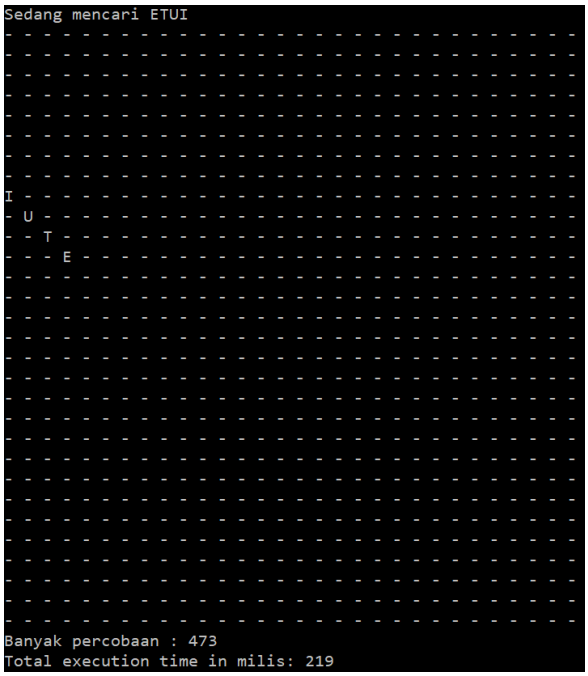

Sedang mencari BULLETPROOF
Banyak percobaan : 411
Total execution time in milis: 164

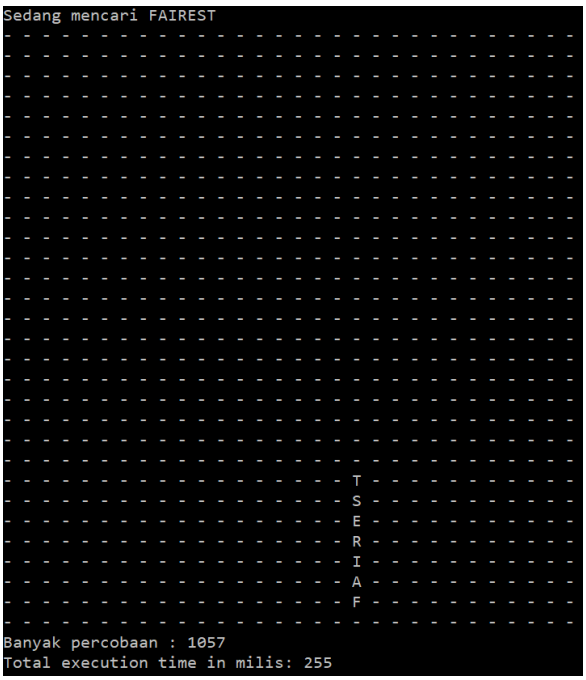

Sedang mencari BUMP
Banyak percobaan : 196
Total execution time in milis: 164

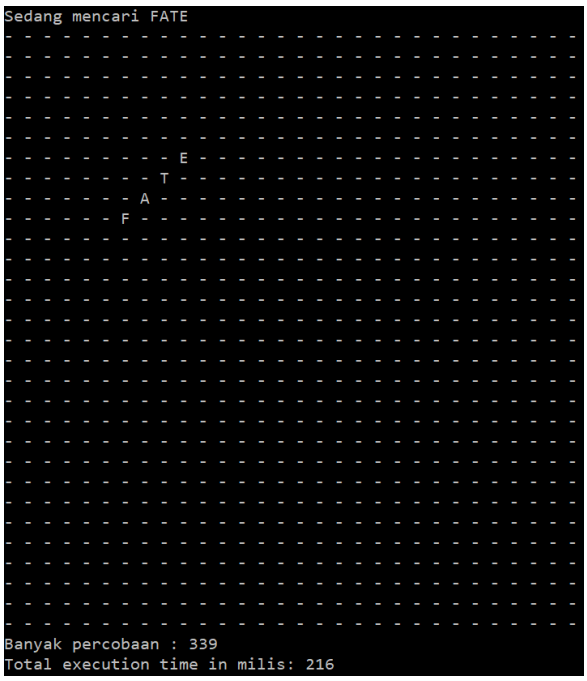

Sedang mencari BUTTS
Banyak percobaan : 441
Total execution time in milis: 220
Sedang mencari COLLECTIVELY
C O L L E C T I V E L Y
Banyak percobaan : 260
Total execution time in milis: 203
Sedang mencari CORAL
Banyak percobaan : 30
Total execution time in milis: 204
Sedang mencari DEHYDRATING
Banyak percobaan : 116
Total execution time in milis: 203

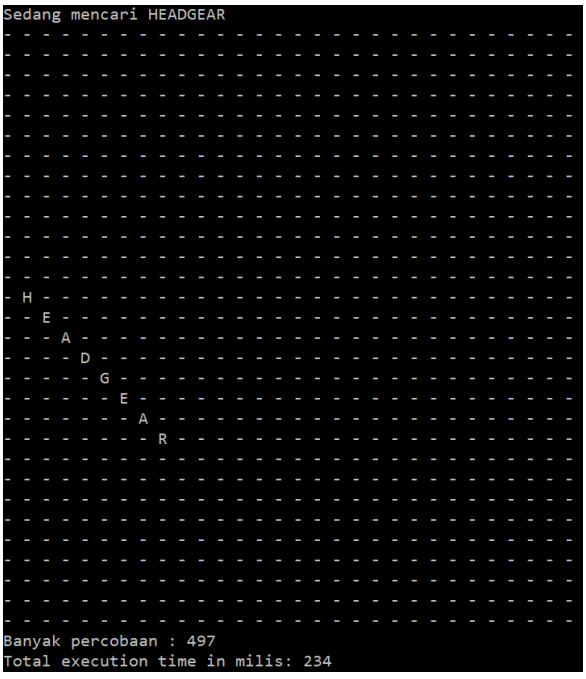

Sedang mencari DITTO
Banyak percobaan : 14
Total execution time in milis: 239

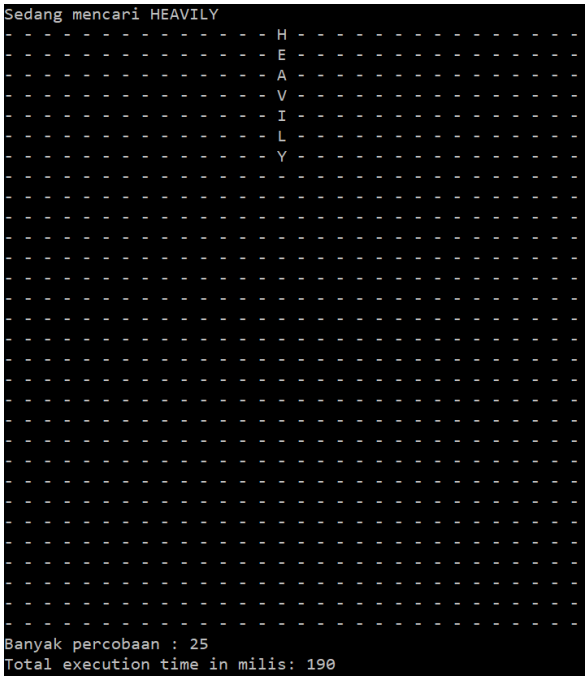

Sedang mencari DONATING
Banyak percobaan : 158
Total execution time in milis: 209

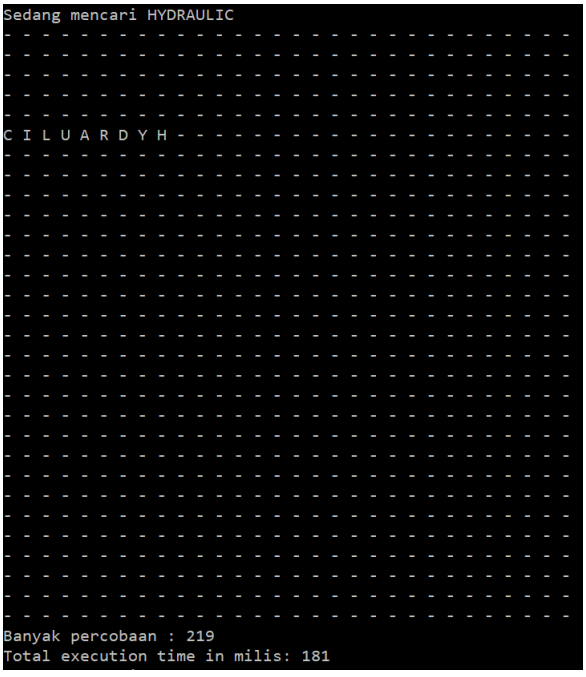

Sedang mencari ETUI
Banyak percobaan : 473
Total execution time in milis: 219

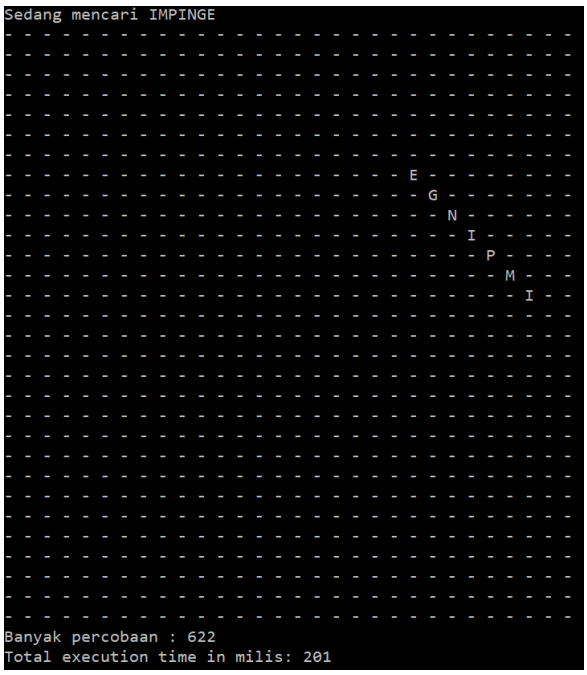

Sedang mencari FAIREST
Banyak percobaan : 1057
Total execution time in milis: 255

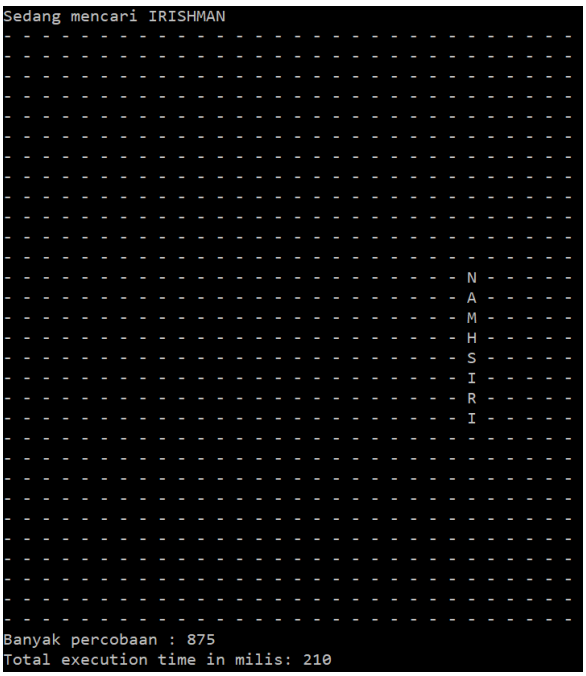

Sedang mencari FATE
Banyak percobaan : 339
Total execution time in milis: 216

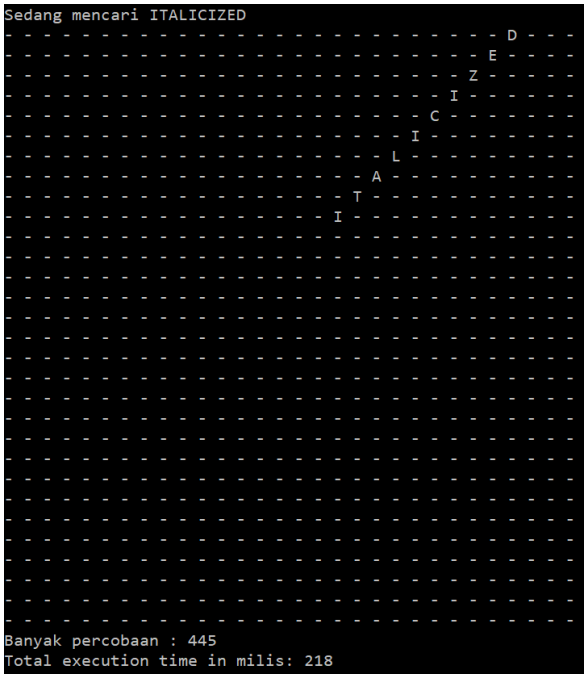

Sedang mencari HEADGEAR
Banyak percobaan : 497
Total execution time in milis: 234

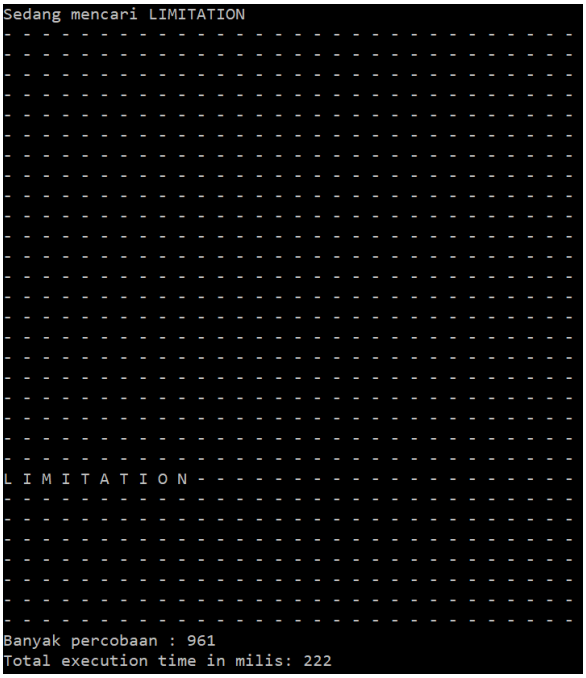

Sedang mencari HEAVILY
Banyak percobaan : 25
Total execution time in milis: 190


Sedang mencari HYDRAULIC
C I L U A R D Y H
Banyak percobaan : 219
Total execution time in milis: 181

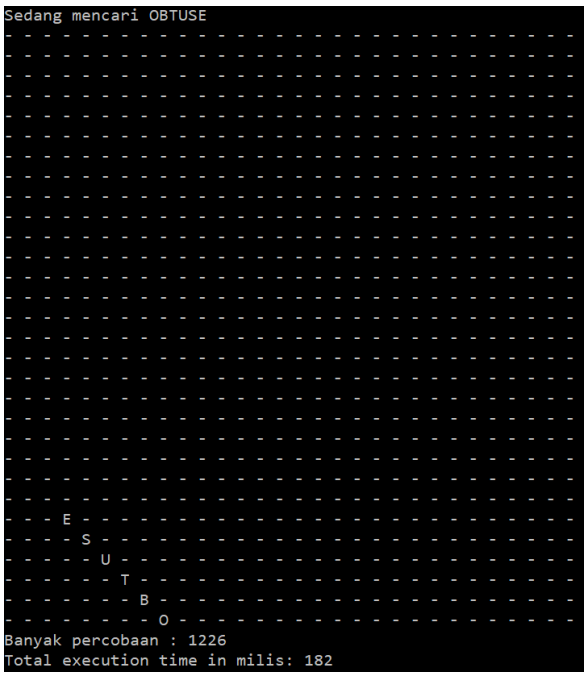

Sedang mencari IMPINGE
Banyak percobaan : 622
Total execution time in milis: 201

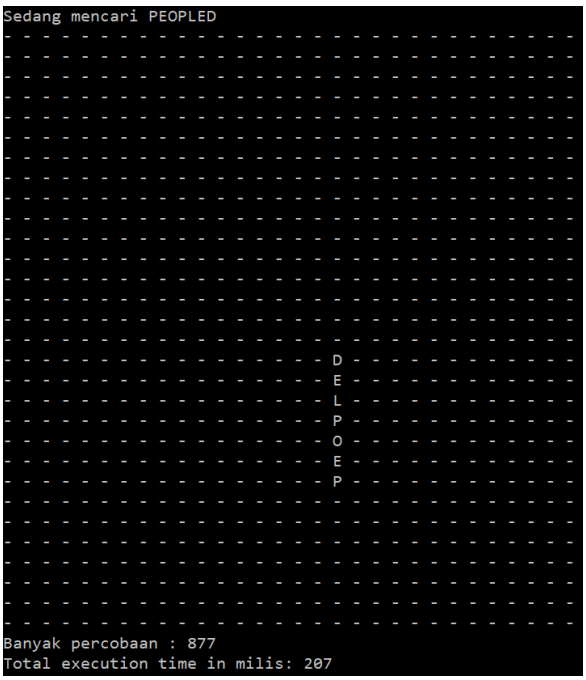

Sedang mencari IRISHMAN
Banyak percobaan : 875
Total execution time in milis: 210

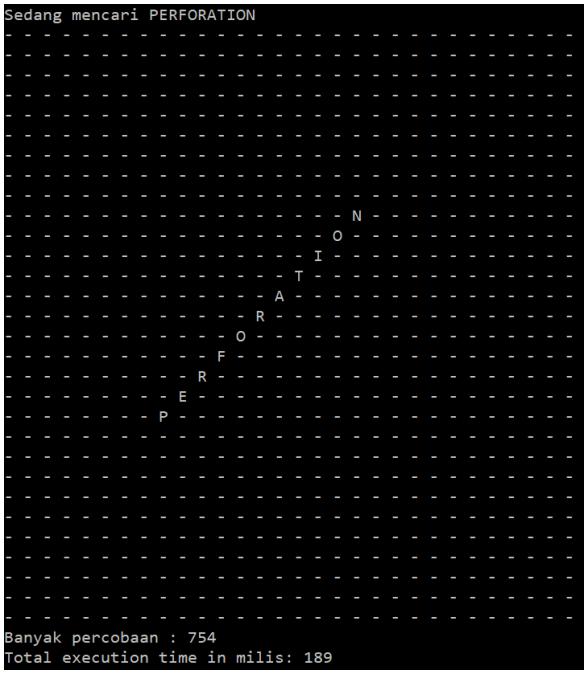

Sedang mencari ITALICIZED
Banyak percobaan : 445
Total execution time in milis: 218

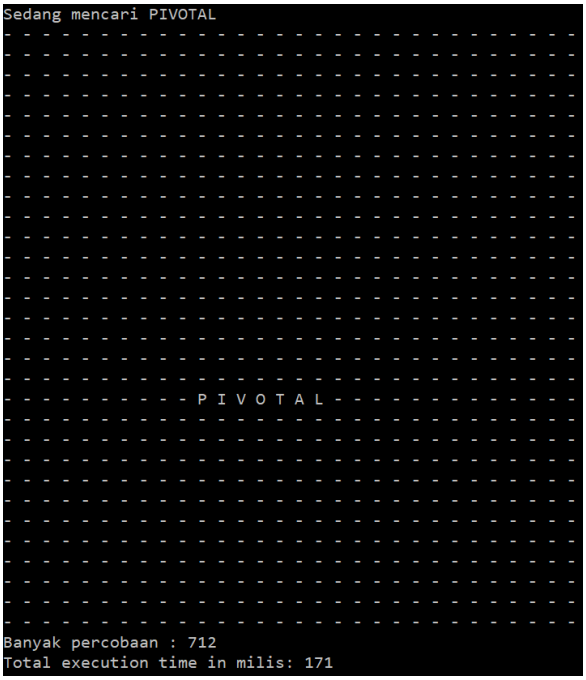

Sedang mencari LIMITATION
Banyak percobaan : 961
Total execution time in milis: 222

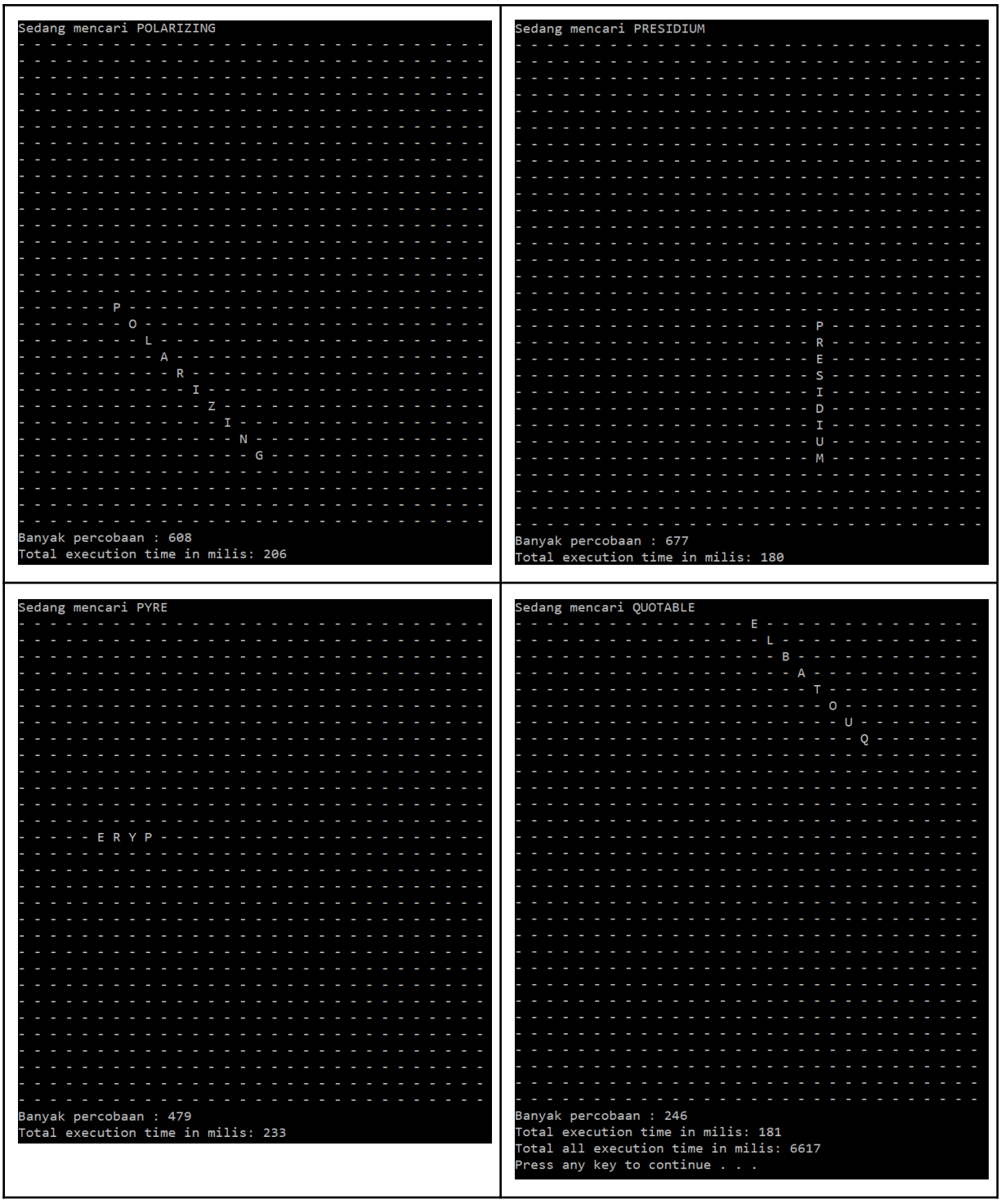

Sedang mencari LOWERING
Banyak percobaan : 73
Total execution time in milis: 189
Sedang mencari MARRIED
Banyak percobaan : 929
Total execution time in milis: 189
Sedang mencari MOTH
Banyak percobaan : 313
Total execution time in milis: 214
Sedang mencari MUTILATION
Banyak percobaan : 428
Total execution time in milis: 252


Sedang mencari OBTUSE
Banyak percobaan : 1226
Total execution time in milis: 182


Sedang mencari PEOPLED
Banyak percobaan : 877
Total execution time in milis: 207


Sedang mencari PERFORATION
Banyak percobaan : 754
Total execution time in milis: 189


Sedang mencari PIVOTAL
Banyak percobaan : 712
Total execution time in milis: 171



Gambar 2.9 Input dan Output Test Case Big 3

Link Drive Kode Program

https://github.com/hcarissa/Tucil1_13520164.git

Checklist

Poin	Ya	Tidak
1. Program berhasil dikompilasi tanpa kesalahan (no syntax error)	✔	
2. Program berhasil running	✔	
3. Program dapat membaca file masukan dan menuliskan luaran.	✔	
4. Program berhasil menemukan semua kata di dalam puzzle	✔	

Daftar Referensi

Slide Kuliah IF2211 Strategi Algoritma - Algoritma Brute Force Bagian 1 - https://informatika.stei.itb.ac.id/~rinaldi.munir/Stmik/2021-2022/Algoritma-Brute-Force-(2022)-Bag1.pdf

Perbandingan Algoritma Brute Force dan Backtracking dalam Permainan Word Search Puzzle

https://informatika.stei.itb.ac.id/~rinaldi.munir/Stmik/2016-2017/Makalah2017/Makalah-IF2211-2017-077.pdf