

Tugas Kecil 1 IF2211 Strategi Algoritma
Penyelesaian Word Search Puzzle dengan Algoritma Brute Force
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Hafidz Nur Rahman Ghozali

13520117

Sekolah Teknik Elektro dan Informatika

Teknik Informatika

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1. Algoritma *Brute Force*

Langkah-langkah:

- Melakukan iterasi untuk setiap kata yang dicari.
Pada pembacaan file, kumpulan kata kunci disimpan di dalam tipe data vector berisi string. Iterasi dilakukan dari kata pertama hingga kata terakhir.
- Melakukan pencarian huruf pertama pada sebuah kata di dalam *puzzle* dari ujung kiri atas.
Program akan mencari huruf pertama pada setiap kata di dalam *puzzle*. Pencarian dilakukan secara sekuensial dari baris pertama ga baris teakhir urut dari huruf paling kiri.
- Apabila menemukan huruf yang cocok, dilanjutkan dengan pencocokan string ke 8 arah yang mungkin.
Apabila huruf pertama kata tersebut ditemukan, akan dilakukan pencocokan string mulai dari arah horizontal ke kanan. Apabila gagal ditemukan, program akan mencari ke arah vertikal atas. Apabila tidak ditemukan kembali, program akan mencari ke arah horizontal kiri. Begitu pula seterusnya dengan arah selanjutnya vertikal bawah, diagonal kanan atas, diagonal kanan bawah, diagonal kiri atas, dan diagonal kiri bawah. Apabila masih tidak ditemukan, program akan mengeluarkan “ <kata> gagal ditemukan”. Pencocokan dilakukan untuk setiap huruf di dalam kata. Apabila sebuah huruf tidak cocok, maka program akan mencari ke arah lainnya.
- Apabila kata ditemukan, melakukan pencatatan posisi kata dan penggantian warna pada setiap huruf.
Pewarnaan di-handle oleh vector 2D. Apabila sebuah kata ditemukan, sel huruf tersebut diisi oleh kode pewarnaan untuk kata tersebut.

2. *Source Program*

```
#include <iostream>
#include <fstream>
#include <vector>
#include <chrono>
using namespace std;
using namespace std::chrono;

// Fungsi untuk memisahkan substring yang dibatasi oleh karakter spasi
bool splitline(string line, vector<vector<char>> &mat,
vector<vector<string>> &color){
    vector<char> vec;
    vector<string> linecolor;
    int len = 0;
    for (int i=0; i<line.length(); i++){
        if(line[i] != ' '){
            vec.push_back(line[i]);
```

```

        linecolor.push_back("\033[37m");
        len++;
    }
}
if (len > 0){
    mat.push_back(vec);
    color.push_back(linecolor);
    return false;
} else return true;
}

// Melakukan filter spasi pada setiap kata yang akan dicari kemudian
menambahkan ke dalam word.
void processWord(string line, vector<string> &word){
    string temp = "";
    for (int i=0; i<line.length(); i++){
        if (line[i] != ' ') temp += line[i];
    }
    word.push_back(temp);
}

// Fungsi untuk melakukan pencocokan string. Mengembalikan true pencocokan
string berhasil, false jika tidak cocok.
bool check(vector<vector<char>> mat, string word, int i, int j, int ver,
int hor, int &totalComparison, vector<vector<string>> &color, int
idxcolor){
    int idx = 1;
    int n = word.length();
    while (idx < n && word[idx] == mat[i+ver*idx][j+hor*idx]){
        totalComparison++;
        idx++;
    }
    totalComparison++;
    if (idx == n){
        string warna;
        if (idxcolor > 5) warna = "\033[1m\033[" + to_string(idxcolor-6+31)
+"m";
        else warna = "\033[" + to_string(idxcolor+31) +"m";
        idx = 0;
        while (idx < n){
            color[i+ver*idx][j+hor*idx] = warna;
            idx++;
        }
        return true;
    } else {
        return false;
    }
}

```

```

// Pencocokan huruf pertama dari sebuah kata kemudian dilanjutkan
pencocokan string secara keseluruhan
void checkWord(vector<vector<char>> mat, string word, int row, int col, int
&totalComparison, vector<vector<string>> &color, int idxcolor){
    int n = word.length();
    bool found = false;
    for (int i=0; i<mat.size(); i++){
        for (int j=0; j<mat[0].size(); j++){
            totalComparison++;
            if (mat[i][j] == word[0]){
                // checking all possibilities
                // horizontal kanan
                if (col-j >= n && !found) found = check(mat, word, i, j, 0,
1, totalComparison, color, idxcolor);

                // horizontal kiri
                if (j+1 >= n && !found) found = check(mat, word, i, j, 0, -
1, totalComparison, color, idxcolor);

                // vertikal atas
                if (i+1 >= n && !found) found = check(mat, word, i, j, -1,
0, totalComparison, color, idxcolor);

                // vertikal bawah
                if (row-i >= n && !found) found = check(mat, word, i, j, 1,
0, totalComparison, color, idxcolor);

                // miring kanan atas
                if (col-j >= n && i+1 >= n && !found) found = check(mat,
word, i, j, -1, 1, totalComparison, color, idxcolor);

                // miring kanan bawah
                if (col-j >= n && row-i >= n && !found) found = check(mat,
word, i, j, 1, 1, totalComparison, color, idxcolor);

                // miring kiri atas
                if (j+1 >= n && i+1 >= n && !found) found = check(mat,
word, i, j, -1, -1, totalComparison, color, idxcolor);

                // miring kiri bawah
                if (j+1 >= n && row-i >= n && !found) found = check(mat,
word, i, j, 1, -1, totalComparison, color, idxcolor);
            }
        }
    }
    if (!found) cout << word << " gagal ditemukan\n";
}

```

```

// Menampilkan puzzle secara keseluruhan.
void displayPuzzle(vector<vector<char>> mat, vector<vector<string>> color){
    cout << endl;
    int row = mat.size();
    int col = mat[0].size();
    for (int i=0; i<row; i++){
        for (int j=0; j<col; j++){
            cout << color[i][j] << mat[i][j] << "\033[0m" << " ";
        }
        cout << endl;
    }
    cout << endl;
}

int main(){
    // File reader
    string line;
    string filename;
    bool status = false;
    do
    {
        cout << "Nama File : ";
        cin >> filename;
        ifstream myfile (filename);
        status = myfile.is_open();
    } while (!status);
    ifstream myfile (filename);

    bool endData = false;
    vector<vector<char>> mat;
    vector<vector<string>> color;
    vector<string> word;
    while (getline (myfile, line)){
        if (!endData) {
            endData = splitline(line, mat, color);
        } else {
            processWord(line, word);
        }
    }
    myfile.close();

    // main program
    // start timer
    auto start = high_resolution_clock::now();

    int row = mat.size(), col = mat[0].size(), lenWord = word.size();
    int totalComparison = 0;

```

```

    for (int i=0; i< word.size(); i++){
        int idxcolor = i%12;
        checkWord(mat, word[i], row, col, totalComparison, color,
idxcolor);
    }

    // display puzzle
    displayPuzzle(mat, color);

    // stop timer
    auto stop = high_resolution_clock::now();
    auto duration = duration_cast<microseconds>(stop - start);

    cout << "Total perbandingan : " << totalComparison << endl;
    cout << "Total durasi pencarian : " << duration.count() << "
microseconds" << endl;
}

```

3. Eksperimen

- a. *Testcase* berukuran 15 x 15 huruf dengan 15 kata kunci

1	G	V	W	V	A	G	G	N	A	M	S	A	N	A	N	17	SEMANGKA
2	A	N	M	X	W	R	A	M	B	U	T	A	N	C	E	18	MANGGA
3	U	L	A	O	S	D	Z	S	G	T	E	A	E	J	J	19	MELON
4	D	I	P	S	W	H	D	A	G	T	N	S	L	S	S	20	APEL
5	N	S	P	U	I	M	B	N	O	W	P	K	C	O	E	21	DURIAN
6	W	P	O	E	K	P	W	G	Z	O	C	U	Z	C	H	22	SAWO
7	P	L	P	Q	N	A	K	G	D	M	L	R	J	S	P	23	ANGGUR
8	A	X	B	Q	O	A	T	U	S	E	T	E	I	Z	S	24	DUKU
9	R	K	J	Z	L	P	K	R	P	Q	F	J	D	X	A	25	ALPUKAT
10	L	F	G	A	E	U	M	A	D	U	R	I	A	N	W	26	PISANG
11	C	Y	S	N	M	R	J	E	N	T	B	G	Q	Z	O	27	SALAK
12	L	X	Q	F	A	B	U	M	K	B	X	X	V	H	X	28	JERUK
13	L	D	Y	P	V	M	U	U	Z	D	E	T	I	I	G	29	RAMBUTAN
14	O	H	F	W	T	W	E	B	A	B	O	M	Y	B	D	30	JAMBU
15	X	M	R	N	N	B	P	S	T	M	J	X	Y	V	Y	31	NANAS
16																	

File : "../test/1.txt"

```

G V W V A G G N A M S A N A N
A N M X W R A M B U T A N C E
U L A O S D Z S G T E A E J J
D I P S W H D A G T N S L S S
N S P U I M B N O W P K C O E
W P O E K P W G Z O C U Z C H
P L P Q N A K G D M L R J S P
A X B Q O A T U S E T E I Z S
R K J Z L P K R P Q F J D X A
L F G A E U M A D U R I A N W
C Y S N M R J E N T B G Q Z O
L X Q F A B U M K B X X V H X
L D Y P V M U U Z D E T I I G
O H F W T W E B A B O M Y B D
X M R N N B P S T M J X Y V Y

Total perbandingan : 3935
Total durasi pencarian : 144981 microseconds

```

b. *Testcase* berukuran 17 x 17 dengan 17 kata kunci

1	E	T	H	B	O	M	R	I	A	D	Y	A	N	T	I	U	A	19	RINALDI
2	Q	J	P	K	L	I	U	F	T	R	I	C	Y	A	Y	K	Y	20	RILA
3	K	I	L	U	N	X	W	M	V	M	J	T	O	A	S	I	M	21	JUDHI
4	K	P	H	A	I	A	E	V	J	D	D	J	R	I	H	P	X	22	ULFA
5	W	I	L	A	R	M	L	W	F	Z	J	O	R	F	A	Y	C	23	AYU
6	L	D	H	M	B	W	A	I	P	A	U	A	I	J	R	L	H	24	YANTI
7	I	E	A	D	L	I	H	M	Z	F	F	F	Y	E	L	P	D	25	HABIBUR
8	X	N	L	U	U	A	B	S	N	L	A	D	Q	Q	I	D	T	26	YANI
9	C	T	I	I	V	J	Z	U	G	U	M	M	Z	D	L	B	P	27	AFWARMAN
10	V	H	H	Y	K	Z	Y	I	R	Q	Z	M	K	G	I	V	X	28	LATIFA
11	G	Q	B	Y	O	F	Y	Q	R	X	M	M	M	V	Y	U	Y	29	RIZAL
12	Q	F	P	A	O	D	O	Y	Q	D	A	T	V	X	X	X	J	30	SATRIO
13	T	G	F	N	I	S	S	V	Q	S	T	X	V	F	A	D	L	31	FARISKA
14	O	E	Q	I	R	W	J	T	A	B	I	V	L	F	X	D	B	32	TRICYA
15	A	O	Y	L	T	K	C	Y	P	M	P	T	Q	H	V	X	P	33	IMAM
16	N	N	N	X	A	V	U	A	P	J	Y	V	S	I	M	X	R	34	HARLILI
17	A	L	I	R	S	F	D	W	A	O	A	F	I	T	A	L	B	35	MASAYU
18																			

File : "../test/2.txt"

```

ETHBOMRIADYANTIU A
QJPKLIUFTRICYAYKY
KILUNXWMVMJTOASIM
KPHAI AEVJDDJR IHPX
WILARMLWFZJORFAYC
LDHMBWAIPUA IJRLH
IEADLIHMFZFFYELPD
XNLUUABSNLADQQIDT
CTIIVJZUGUMMZDLBP
VHHYKZYIRQZMKGIVX
GQB YOFYQ R XMMVYUY
QFP AODDYQDPTVXXXJ
TGFNISSVQSTXVFADL
OEQIRWJTABIVLFXDB
AOYLTKCYPMPTQHVPX
NNNXAVUAPJYVSIMXR
ALIRSFDAOAFITALB

Total perbandingan : 5588
Total durasi pencarian : 193850 microseconds

```

c. *Testcase* berukuran 20 x 20 dengan 30 kata kunci

1	V	T	O	U	R	N	A	M	E	N	T	E	D	F	K	C	G	E	R	D	22	OPENING
2	L	P	T	Y	I	F	H	V	E	J	J	Q	E	H	S	E	A	W	E	K	23	BLACK
3	M	J	A	Q	O	U	B	F	U	Y	Q	L	B	W	T	W	M	M	H	F	24	CASTLING
4	G	V	E	T	V	R	S	J	M	A	D	B	G	A	V	X	E	S	C	M	25	CHAMPION
5	K	O	F	C	M	L	X	M	N	S	B	E	M	O	G	A	B	B	S	S	26	CHECKMATE
6	R	P	E	H	A	O	K	Y	B	P	Q	K	R	H	B	K	X	L	I	L	27	CHESSBOARD
7	U	R	D	E	M	P	V	Q	D	W	C	A	B	I	S	H	O	P	F	V	28	DEFEAT
8	E	A	P	S	T	E	R	E	I	E	P	W	K	D	Y	F	W	O	C	S	29	DRAW
9	N	K	M	S	H	N	R	Z	H	S	A	S	U	R	V	P	N	E	R	E	30	FISCHER
10	Z	P	A	B	G	I	E	C	A	X	T	Z	B	K	Q	W	I	A	Z	R	31	ENPASSANT
11	Y	F	T	O	I	N	M	K	D	A	C	H	A	M	P	I	O	N	T	T	32	GAME
12	G	M	C	A	N	G	U	L	L	L	A	V	I	R	A	K	I	N	G	K	33	KARPOV
13	E	B	H	R	K	A	N	E	K	D	S	V	Y	M	Z	L	A	H	T	P	34	KASPAROV
14	T	Z	E	D	H	X	M	W	C	Q	T	R	U	L	E	S	R	N	W	W	35	KING
15	A	P	A	W	N	A	O	A	T	L	L	B	Z	N	S	T	Q	Y	H	S	36	KNIGHT
16	R	I	J	V	T	E	L	R	I	S	I	K	C	A	L	B	S	F	I	A	37	MATCH
17	T	E	N	E	E	U	Q	D	M	L	N	P	P	U	J	A	D	I	T	Q	38	ROOK
18	S	C	G	Y	N	C	V	M	E	O	G	N	Y	I	W	Y	W	J	E	H	39	BISHOP
19	S	E	N	V	X	W	C	N	R	U	E	P	O	S	I	T	I	O	N	E	40	PAWN
20	R	O	L	R	K	I	F	S	G	T	P	A	N	C	X	Z	I	N	W	D	41	PIECE
21																				42	POSITION	
																				43	QUEEN	
																				44	RIVAL	
																				45	MOVE	
																				46	RULES	
																				47	STALEMATE	
																				48	STRATEGY	
																				49	TIMER	
																				50	TOURNAMENT	
																				51	WHITE	

File : "../test/3.txt"


```

V T O U R N A M E N T E D F K C G E R D
L P T Y I F H V E J J Q E H S A W E K
M J A Q O U B F U Y Q L B W T W M M H F
G V E T V R S J M A D B G A V X E S C M
K O F C M L X M N S B E M O G A B B S S
R P E H A O K Y B P Q K R H B K X L I L
U R D E M P V Q D W C A B I S H O P F V
E A P S T E R E I E P W K D Y F W O C S
N K M S H N R Z H S A S U R V P N E R E
Z P A B G I E C A X T Z B K Q W I A Z R
Y F T O I N M K D A C H A M P I O N T T
G M C A N G U L L A V I R A K I N G K
E B H R K A N E K D S V Y M Z L A H T P
T Z E D H X M W C Q T R U L E S R N W W
A P A W N A O A T L L B Z N S T Q Y H S
R I J V T E L R I S I K C A L B S F I A
T E N E E U Q D M L N P P U J A D I T Q
S C G Y N C V M E O G N Y I W Y W J E H
S E N V X W C N R U E P O S I T I O N E
R O L R K I F S G T P A N C X Z I N W D

Total perbandingan : 13720
Total durasi pencarian : 284671 microseconds

```

d. *Testcase* berukuran 22 x 22 dengan 23 kata kunci

1	O F B S A G O L Y Z R D E K T A D Y E I B L	24	ARGENTINA
2	A M N N T A A A S Q B W H C I G T N Z M A S	25	INDONESIA
3	M B I P Q G M Q V R S D R S J U Q O X P A G	26	MALAYSIA
4	B H W P U A G S J V N E E T E A P D C Y Z F	27	SPANYOL
5	C D Z T N W S O A D N N P G B T U P M J M Q	28	PRANCIS
6	F L R J G N A E E A O U R F M E Y R W A F W	29	BELANDA
7	A O K I D C I X T D R D A V F M H U E H Z U	30	AUSTRALIA
8	P I E H W X S O N K I P N Z G A A E Y P F I	31	BELGIA
9	F G G A S A U I Y E S Y C X O L N A E R O K	32	RUSIA
10	M H M L I P R X D Y E X I O B A I A U Y H U	33	CHINA
11	W U S H E E A P B Y M T S E H W T I Y U U W	34	BULGARIA
12	Z F O T E B I N T A H I L A H F N L A N V C	35	BANGLADESH
13	M A L A Y S I A Y O N A N U M W E O A A R F	36	GUATEMALA
14	B U L G A R I A N O N G V A A E G G Q N Y L	37	HONDURAS
15	W D F R S Q J D O D L W L E T M R N L I G Y	38	MONGOLIA
16	G D Z W A W U J A A X Q C A N A A O Z D U Q	39	PORTUGAL
17	F S G C Z R Q Z J M Z A G D D E L M H B Y L	40	SINGAPURA
18	J U Y B A I K R U T J H X X P E Z E F C Z Z	41	VENEZUELA
19	E G R S I R U S J G M R I W G D S U S R F U	42	YUNANI
20	E G A U P T C U U A A K R H W B L H E S I Z	43	YAMAN
21	C Z F C G M G B Y N E B G D D R J W C L F D	44	TURKI
22	A I L A R T S U A S I N G A P U R A K O A E	45	PERU
23		46	MESIR

File : "../test/4.txt"

```

O F B S A G O L Y Z R D E K T A D Y E I B L
A M N N T A A S Q B W H C I G T N Z M A S
M B I P Q G M Q V R S D R S J U Q O X P A G
B H W P U A G S J V N E E T E A P D C Y Z F
C D Z T N W S O A D N N P G B T U P M J M Q
F L R J G N A E E A O U R F M E Y R W A F W
A O K I D C I X T D R D A V F M H U E H Z U
P I E H W X S O N K I P N Z G A A E Y P F I
F G G A S A U I Y E S Y C X O L N A E R O K
M H M L I P R X D Y E X I O B A I A U Y H U
W U S H E E A P B Y M T S E H W T I Y U U W
Z F O T E B I N T A H I L A H F N L A N V C
M A L A Y S I A Y O N A N U M W E O A A R F
B U L G A R I A N O N G V A A E G G Q N Y L
W D F R S Q J D O D L W L E T M R N L I G Y
G D Z W A W U J A A X Q C A N A A O Z D U Q
F S G C Z R Q Z J M Z A G D D E L M H B Y L
J U Y B A I K R U T J H X X P E Z E F C Z Z
E G R S I R U S J G M R I W G D S U S R F U
E G A U P T C U U A A K R H W B L H E S I Z
C Z F C G M G B Y N E B G D D R J W C L F D
A I L A R T S U A S I N G A P U R A K O A E

Total perbandingan : 12592
Total durasi pencarian : 321107 microseconds

```

e. *Testcase* berukuran 22 x 22 dengan 25 kata kunci

1	L R S S E N D W E R H S E C Q S H M N P G Y	24	CLAN
2	E O L F L D P R M W C Z M R J S I G R E V K	25	BRACE
3	I O H I P A R I B Z C M K J E E V C O L O N	26	SLEUTH
4	W K W P Q W N K U J A D K Z R R E X X C L F	27	CAKLE
5	Y E G D F H Q D A I T E E X I G E S V S Q Y	28	HIVE
6	S R E F Z B N O I T I L A O C N M G K K Q R	29	CLUTCH
7	R Y D J U M J E O X F E C O U O R C W H T K	30	COALITION
8	M A U M U T G V I U P A U G A C A B Q T N D	31	FLOCK
9	D M B V H I N O R M U O U Y Q P W I E F G T	32	CONGRESS
10	R I Y B A M U R N H W H N B L C S P E K O T	33	PACK
11	R Y Z R L L V D X K I X O A W O D R A W N Y	34	HERD
12	W I M O O E F J M T S X B M L V P B N L F Z	35	BED
13	S R V O M G X C B M O A L T R C Y A V G T Q	36	HORDE
14	L I H Y I Z E W L T N D T L S O O X J R M L	37	MOB
15	X C P D Y V W W V Z H N T V B E I D O A J B	38	NEST
16	S Z K D Q M B M P Y C D H C E A N O F X I M	39	DROVE
17	K O B Z O A I O P H K A L E D L P F D J E L	40	POD
18	C M C V G O C V O J K U C E R Y Y O S I N X	41	PRIDE
19	P I C J W G R R M S T C C K I D P F S T B D	42	RABBLE
20	S L E U T H D B L C B A O H L M S Q S V D O	43	ROOKERY
21	T I G G H E W L H K R B X L P E P R I D E M	44	TROOP
22	H L P L X E C N Y B Q D M O F E H V B O M Y	45	SHREWDNESS
23		46	BROOD
		47	SWARM
		48	SCHOOL

File : "../test/5.txt"

```
L R S S E N D W E R H S E C Q S H M N P G Y
E O L F L D P R M W C Z M R J S I G R E V K
I O H I P A R I B Z C M K J E E V C O L O N
W K W P Q W N K U J A D K Z R R E X X C L F
Y E G D F H Q D A I T E E X I G E S V S Q Y
S R E F Z B N O I T I L A O C N M G K K Q R
R Y D J U M J E O X F E C O U O R C W H T K
M A U M U T G V I U P A U G A C A B Q T N D
D M B V H I N O R M U O U Y Q P W I E F G T
R I Y B A M U R N H W H N B L C S P E K O T
R Y Z R L L V D X K I X O A W O D R A W N Y
W I M O O E F J M T S X B M L V P B N L F Z
S R V O M G X C B M O A L T R C Y A V G T Q
L I H Y I Z E W L T N D T L S O O X J R M L
X C P D Y V W W V Z H N T V B E I D O A J B
S Z K D Q M B M P Y C D H C E A N O F X I M
K O B Z O A I O P H K A L E D L P F D J E L
C M C V G O C V O J K U C E R Y Y O S I N X
P I C J W G R R M S T C C K I D P F S T B D
S L E U T H D B L C B A O H L M S Q S V D O
T I G G H E W L H K R B X L P E P R I D E M
H L P L X E C N Y B Q D M O F E H V B O M Y

Total perbandingan : 13973
Total durasi pencarian : 319782 microseconds
```

- f. *Testcase* berukuran 34 x 34 dengan 40 kata kunci

1	X L G B U R C Y Q I Y Y T F S L K J X R V W A N D N L I C R S M K X	36	ANNUALLY
2	P C Y N G E F C L M W C O C T E A Z I V X A O Z M A U Q V K I F G V	37	BASEBALL
3	L B H I K I N V O L V E A M S V O U H G U D E H Q M N G A N E K F A	38	CASHING
4	O D Q U T N Q X L U O R E P E O J B G D R H Q Q I E A F N C H W L W	39	CLUE
5	O N W Z R V P W Y Q C H D W T R B K O H J Y E G R S U O A I P R S Q	40	DAME
6	C Q T Y B E N P A I T E Q P T S J E G B E M L S J R W Y L Z D X M C	41	DEFERENCE
7	J T T E Q N H P T I Z S W G A Z P B R A A D R D N O W E F E O W I D	42	EDIBLE
8	A C N A X T T I E I U T M D F W X U X Y B P F Z Q H O Y D D S Z Q H	43	GUILTLESS
9	M T W P Z R E C R R Z S Q A W A F I S V I U R Y T A U N Q O T V I S	44	HAILING
10	R R H J A S J E J R S E U G O L O N O M S R E L Z M Y N J K N X C Y	45	HORSEMAN
11	E A D O W P V I S T V O P D T R K A W L J V H E Y A O U Z E A I T I	46	MODALITY
12	C Y D J A L U G C U S A N Y D I J T O R Z X Q M W I E S V Y Z P K N	47	OVULAR
13	Y F F B U K D P W O I J P A V Z D T W M C T M U N X B L M T E Z X P	48	PERSONAL
14	V U U P M K K I E E N I R V L C J D K M U D P S H C E S S D Q E Q Q	49	REINVENT
15	X X A Z D J A X S G C K B S S H A M Z G G X V E Y H R G I X J G U W	50	SCARCITIES
16	A I U L P M B K R A O V T N E A Z C B U H F W R R X O B H A T Y Z E	51	SCENARIO
17	N D E D C U O N L D C E K I V I M U P F G Y D P D R L O V U L A R X	52	SLEAZY
18	A B N O A O R L L Q T B Q O U R W T R G T R T D G E M D H M X W D O	53	SUNNY
19	F F S I B M Y Q J K E U V M Q L E L Z I Q S M E G U D C W X R R J X	54	TEXTBOOKS
20	X I Z T R Y E O I R A N E C S I D R L X C K Z F D E T R A P E D D T	55	UPWARDLY
21	W C X Q H D L C W F K E V C O F F A T O T O T E J M L G G R I J T J	56	ASSIGN
22	U E Q R U D I L T G W K O D Y T D O N A X B B R T A X Q M Z T G Y V	57	CHAIRLIFT
23	T P O L L A W B A Q W G S Q M O K C D R X Q S E Q I J U C L U E X K	58	CONCAVE
24	Y O A K K P J D S U N L J A M W A Y A N J C Q N F O U P W A R D L Y	59	DEPARTED
25	A U J P T K F R U I N H J R C V V Z R I R M I C Y S F C V P I C J S	60	DOCTOR
26	A S U I R Y K A M V G N F L E P W X D H E O G E P J K D F V I O A T	61	FATTEST
27	Z C S G W V P A E N F V A L Y D G C P Y K E T N D F V T A L A I L O	62	GAMING
28	K Q W I K R G R I R Q S U A K C D N C J U V U C A V K W J Z X X T P	63	INVOLVE
29	B L H R G I L H K L P R C B C O D G I D C C O L O S N U G N E S S P	64	LAUGHED
30	D O Z F S N S R T L C N A E C I S S E L T L I U G D G M R F U X R E	65	LUNA
31	S D N P A A Q S T P J B G S E I M Y K X I Z Z A U B P D S Q B T C D	66	MINNOW
32	F A C N C Q A D U T Y N E A E T R K M S F A L F A T L X K B K Z Z W	67	MONOLOGUE
33	S G C U T V I N T U D B U B E E S D P A K Q H H M J W N H I R D T M	68	OBOE
34	W I P O G J M T D G C O O Z N K I Y N I X M V L H F S E R E V V E X	69	PRESUME
35		70	PULVERIZED
		71	SNUGNESS
		72	SOBER
		73	STOPPED
		74	TYPICALLY
		75	WALLOP

File : "../test/6.txt"

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X L G B U R C Y Q I Y Y T F S L K J X R V W A N D N L I C R S M K X
P C Y N G E F C L M W C O C T E A Z I V X A O Z M A U Q V K I F G V
L B H I K I N V O L V E A M S V O U H G U D E H Q M N G A N E K F A
O D Q U T N Q X L U O R E P E O J B G D R H Q Q I E A F N C H W L W
O N W Z R V P W Y Q C H D W T R B K O H J Y E G R S U O A I P R S Q
C Q T Y B E N P A I T E Q P T S J E G B E M L S J R W Y L Z D X M C
J T T E Q N H P T I Z S W G A Z P B R A A D R D N O W E F E O W I D
A C N A X T T I E I U T M D F W X U X Y B P F Z Q H O Y D D S Z Q H
M T W P Z R E C R R Z S Q A W A F I S V I U R Y Y T A U N Q O T V I S
R R H J A S J E J R S E U G O L O N O M S R E L Z M Y N J K N X C Y
E A D O W P V I S T V O P D T R K A W L J V H E Y A O U Z E A I T I
C Y D J A L U G C U S A N Y D I J T O R Z X Q M W I E S V Y Z P K N
Y F F B U K D P W O I J P A V Z D T W M C T M U N X B L M T E Z X P
V U U P M K K I E E N I R V L C J D K M U D P S H C E S S D Q E Q Q
X X A Z D J A X S G C K B S S H A M Z G G X V E Y H R G I X J G U W
A I U L P M B K R A O V T N E A Z C B U H F W R R X O B H A T Y Z E
N D E D C U O N L D C E K I V I M U P F G Y D P D R L O V U L A R X
A B N O A O R L L Q T B Q O U R W T R G T R T D G E M D H M X W D O
F F S I B M Y Q J K E U V M Q L E L Z I Q S M E G U D C W X R R J X
X I Z T R Y E O I R A N E C S I D R L X C K Z F D E T R A P E D D T
W C X Q H D L C W F K E V C O F F A T O T O T E J M L G G R I J T J
U E Q R U D I L T G W K O D Y T D O N A X B B R T A X Q M Z T G Y V
T P O L L A W B A Q W G S Q M O K C D R X Q S E Q I J U C L U E X K
Y O A K K P J D S U N L J A M W A Y A N J C Q N F O U P W A R D L Y
A U J P T K F R U I N H J R C V V Z R I R M I C Y S F C V P I C J S
A S U I R Y K A M V G N F L P W X D H E O G E P J K D F V I O A T
Z C S G W V P A E N F V A L Y D G C P Y K E T N D F V T A L A I L O
K Q W I K R G R I R Q S U A K C D N C J U V U C A V K W J Z X X T P
B L H R G I L H K L P R C B C O D G I D C C O L O S N U G N E S S P
D O Z F S N S R T L C N A E C I S S E L T L I U G D G M R F U X R E
S D N P A A Q S T P J B G S E I M Y K X I Z Z A U B P D S Q B T C D
F A C N C Q A D U T Y N E A E T R K M S F A L F A T L X K B K Z Z W
S G C U T V I N T U D B U B E E S D P A K Q H H M J W N H I R D T M
W I P O G J M T D G C O O Z N K I Y N I X M V L H F S E R E V V E X

Total perbandingan : 52170
Total durasi pencarian : 760982 microseconds

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g. *Testcase* berukuran 34 x 34 dengan 38 kata kunci

1	XOTBJQALBRFKCCZEFTUPEKOYFEHEL I WYDA	36	TABLE
2	IPPOLXXCVXAMHTKGNITOOKYYXRIBQKTDZB	37	CHAIR
3	YTSUEBVPGLBUFDUATOXCKLIVVG YKXGJAGT	38	WARDROBE
4	LREMNV TQFBOENGREERH MVXB XGUGIZQAPCV	39	REFRIGERATOR
5	RKYAACOUTT ZGROYALCWPRPFBEMCMNYJNRG	40	DOOR
6	IFCQREILPUILDDUJEZDUDAKCDGFXUGCCYK	41	WINDOW
7	MUQGS GVRTGMOINP WVDJTRNSPEGAD EBP IEQ	42	LAMP
8	VMPPTRFWPNEINQM FIRCXSNAUOKPQDHW AJN	43	BICYCLE
9	LWOBOUSCCDTBRGFISHOHAXIHVMFY YOPZNB	44	STOVE
10	EYPQVXTLDCZSGJTSIAHEAWMDAYJQZUORKB	45	CLOCK
11	LAAEENOTR TLR ETSLOBJRGILLUGDCCKOBKV	46	BOLSTER
12	RVPFQCHHLC EOI HJZNBKWIJRVIWDYEENBYX	47	HANDPHONE
13	FUELKVGNMFKOAAJPVKS S BGCCVEOSOV ARWQ	48	COMPUTER
14	JIRDDWXSROPV BGDQLHKCMTCDHEUHAMOSA H	49	MONITOR
15	MFUPQOV IDDLRMOLVONF DN RKJHIBYHTRTRW	50	PILLOW
16	XBNJPNGSEHTOLCTVLR TLV ISETIXBI ZONDO	51	BOOK
17	DQICZEGIKPORKN QOCUFSQH VCTDYNXEKARD	52	TELEVISION
18	FKYCRETTRDVPXOBR LUAOLSAHWAOAXZDPON	53	BAG
19	EISAYMMHJ IYATCSCZF CBL SKMDMLTABLEBI	54	CLOTHES
20	LHTSOCDUAA MFSV VOLHZZ EKKSKLWPONVMEW	55	PARFUME
21	COLBABLZFRG IAO MBGKDRZQCGVDONQUMKEA	56	SHIRT
22	RBAZRLIEFROEJESZE OJYVULYURQVXC L DTR	57	JEANS
23	RGSUEHGMJSAR O UTERDOWYJSZ NKPWTB XOOA	58	ROUTER
24	WOMOTTTTE DUEPSBNRMDSWQOFFUXFVSKJKYM	59	BOTOL
25	LLOUUCBWI ZKOCGRFNUPBECOFFSRZMRRZAR	60	PAPER
26	ORCDPSLEOMRRZAYTTVXYAZFAPXULJHBHKQ	61	SUITCASE
27	JCADMKCRAWAYG SVOTE AQLTBUNIMMBAJCRU	62	BOWL
28	VORAOPILL OWAQB DXYROFNKZLA AWWROYJSN	63	PLATE
29	LDFZCLVVA MMSBKSAOAWWPPNLBNPB U UOWWF	64	MUG
30	OLEPXYAXEZZKF BKIVVXXLIMJYDENS SPKJN	65	DEODORANT
31	WUEMHGNS SSGGDDFR LDZHIHLNXDLFQHNBROO	66	PORK
32	COBCGMI I BPU EWHTYELDGX MN IJVFCEPLOCK	67	FRYINGPAN
33	ZQGULKOKUNU FKLFUAMWLVQFOLTBSLIPHRA	68	SHELF
34	MFOOHV F YHVUNT FXBDIHGPAHTRNKVFSNOLL	69	BARBEL
35		70	BED
		71	GLASS
		72	PANTS
		73	SPOON

File : "../test/7.txt"

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XOTBJQALBRFKCCZEFTUPEKOYFEHELIIWYDA
IPPOLXXCVXAMHTKGNITOOKYYXRIBQKTDZB
YTSUEBVPGLBUFDUATOXCKLIVVGYKXGJAGT
LREMNVQTQFBOENGREERHMOVXBXGUGIZQAPCV
RKYAACOUTTZZGROYALCWP RPFBEMCMNYJNRG
IFCQREILPUIILDUDUEZDUDAKCDGFXUGCCYK
MUQGSGVRTGMOINPWVDJTRNSPEGADDEBP IEQ
VMPPTTRFWPNEINQMFI RCXSN AUOK PQDHW AJN
LWOB OUSC CDTBRGFI SHOHAXIHVMFY YOPZ NB
EY PQVXT LDCZSGJTSIAHEAWMDAYJQZUORKB
LA AE ENOTRTLRETSLOBJRGILLUGDCCKOBKV
RV PFQCHHLC EOIHJZNBKWIJRV IWDYEENBYX
FUELKVGNMFKOAAJPVKSSBGCCVEO SOVARWQ
JIRDDWXSROPVBGDQLHKCMTC DHEUHAM OSAH
MFUPQOV IDDL RMOLVONFDNRKJHIBYHTRTRW
XBNJPNGSEHTOLCTVLR TLV IS ETIXBI ZONDO
DQ ICZEGIKPORKNQOCUF SQHVCTDYNX EKARD
FKYCRETTTRDVPXOBR LU AOLSAHWAOAXZDPON
EISAYMMHJIYATCSCZFCBL SKMDMLT ABLEBI
LHTS O C DUAAMFSV VOLHZZ EK KSKLW PONVMEW
COLBABLZFRGIAOMB GKDRZQCGVDONQUMKEA
RB AZRLIEFR OEJESZE OJYVULYURQVXC LDTR
RGSUEHGMJSAROUTERDOWYJSZ NKPTBXO OA
WOMOTTTE DUEPSBNRMDSWQOFFUXFVSKJKYM
LLOUCBWIZKOCGRFNUPBECOFFSRZMR RZAR
ORCDPSLEOMRRZAYTTVXYAZFAPXULJHBHKQ
JCADM KCRAWAYG SVOTE AQLTBUNIMMBAJCRU
VORA OPI LLOWAQBDXYROFNKZLA AWWROYJSN
LDFZCLVVAMMSBKSAOAWWPPNLBNPBUUOWWF
OLEPXYAXEZZKF BKIVVXXLIMJYDEN SSPKJN
WUEMHGNSSGGDDFR LDZHIHLNXDLFQHNBROO
COBCGMIIBPU EWHTYELDGXMNIJVFCEPLOCK
ZQGULKOKUNUFKLFUAMWL VQFOLTBSLIPHRA
MFOOHV FYHVUNT FXBDIHGPAHTRNKVF SNOLL

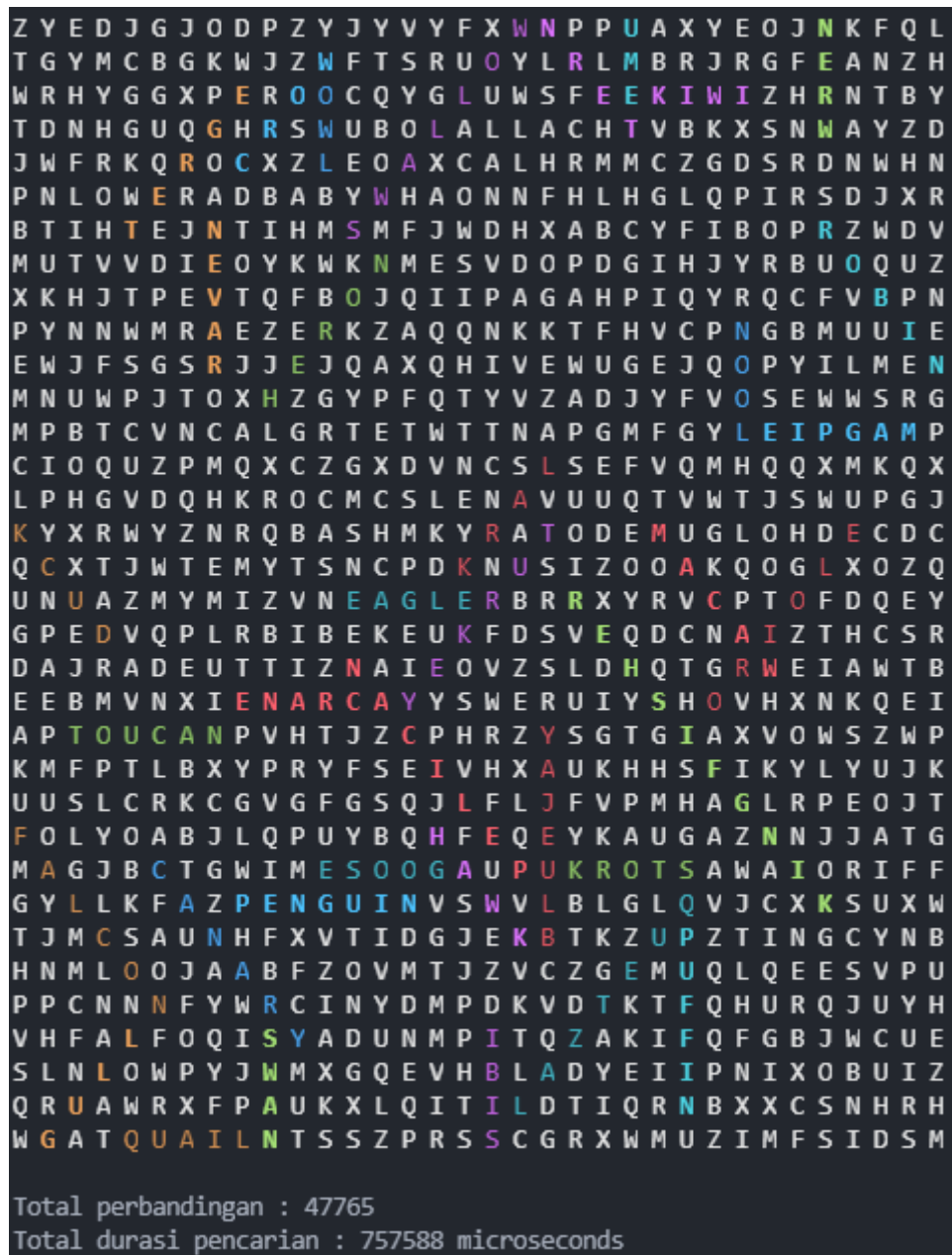
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Total perbandingan : 49386
Total durasi pencarian : 926966 microseconds

- h. *Testcase* berukuran 34 x 34 dengan 36 kata kunci

1	Z Y E D J G J O D P Z Y J Y V Y F X W N P P U A X Y E O J N K F Q L	36	BLUEJAY
2	T G Y M C B G K W J Z W F T S R U O Y L R L M B R J R G F E A N Z H	37	HERON
3	W R H Y G G X P E R O O C Q Y G L U W S F E E K I W I Z H R N T B Y	38	QUAIL
4	T D N H G U Q G H R S W U B O L A L L A C H T V B K X S N W A Y Z D	39	CANARY
5	J W F R K Q R O C X Z L E O A X C A L H R M M C Z G D S R D N W H N	40	IBIS
6	P N L O W E R A D B A B Y W H A O N N F H L H G L Q P I R S D J X R	41	QUETZAL
7	B T I H T E J N T I H M S M F J W D H X A B C Y F I B O P R Z W D V	42	CRANE
8	M U T V V D I E O Y K W K N M E S V D O P D G I H J Y R B U O Q U Z	43	KINGFISHER
9	X K H J T P E V T Q F B O J Q I I P A G A H P I Q Y R Q C F V B P N	44	RAVEN
10	P Y N N W M R A E Z E R K Z A Q Q N K K T F H V C P N G B M U U I E	45	CROW
11	E W J F S G S R J J E J Q A X Q H I V E W U G E J Q O P Y I L M E N	46	KIWI
12	M N U W P J T O X H Z G Y P F Q T Y V Z A D J Y F V O S E W S R G	47	ROBIN
13	M P B T C V N C A L G R T E T W T T N A P G M F G Y L E I P G A M P	48	LARK
14	C I O Q U Z P M Q X C Z G X D V N C S L S E F V Q M H Q Q X M K Q X	49	STORK
15	L P H G V D Q H K R O C M C S L E N A V U U Q T V W T J S W U P G J	50	DUCK
16	K Y X R W Y Z N R Q B A S H M K Y R A T O D E M U G L O H D E C D C	51	LOON
17	Q C X T J W T E M Y T S N C P D K N U S I Z O O A K Q O G L X O Z Q	52	SWALLOW
18	U N U A Z M Y M I Z V N E A G L E R B R R X Y R V C P T O F D Q E Y	53	EAGLE
19	G P E D V Q P L R B I B E K E U K F D S V E Q D C N A I Z T H C S R	54	MACAW
20	D A J R A D E U T T I Z N A I E O V Z S L D H Q T G R W E I A W T B	55	SWAN
21	E E B M V N X I E N A R C A Y Y S W E R U I Y S H O V H X N K Q E I	56	EGRET
22	A P T O U C A N P V H T J Z C P H R Z Y S G T G I A X V O W S Z W P	57	MAGPIE
23	K M F P T L B X Y P R Y F S E I V H X A U K H H S F I K Y L Y U J K	58	TERN
24	U U S L C R K C G V G F G S Q J L F L J F V P M H A G L R P E O J T	59	EMU
25	F O L Y O A B J L Q P U Y B Q H F E Q E Y K A U G A Z N N J J A T G	60	ORIOLE
26	M A G J B C T G W I M E S O O G A U P U K R O T S A W A I O R I F F	61	TOUCAN
27	G Y L L K F A Z P E N G U I N V S W V L B L G L Q V J C X K S U X W	62	FALCON
28	T J M C S A U N H F X V T I D G J E K B T K Z U P Z T I N G C Y N B	63	OWL
29	H N M L O O J A A B F Z O V M T J Z V C Z G E M U Q L Q E E S V P U	64	TURKEY
30	P P C N N N F Y W R C I N Y D M P D K V D T K T F Q H U R Q J U Y H	65	GOOSE
31	V H F A L F O Q I S Y A D U N M P I T Q Z A K I F Q F G B J W C U E	66	PELICAN
32	S L N L O W P Y J W M X G Q E V H B L A D Y E I I P N I X O B U I Z	67	WREN
33	Q R U A W R X F P A U K X L Q I T I L D T I Q R N B X X C S N H R H	68	GULL
34	W G A T Q U A I L N T S S Z P R S S C G R X W M U Z I M F S I D S M	69	PENGUIN
35		70	HAWK
		71	PUFFIN

File : "../test/8.txt"



4. Alamat Kode Program

Link Github :

<https://github.com/hafidznrg/Stima-WordSearchPuzzle>

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