

Laporan Tugas Kecil 1 Strategi Algoritma

Checklist

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

Algoritma Brute Force

Dalam penyusunan algoritma program ini menggunakan pendekatan brute force dimana berarti dalam pembangunan algoritma tidak dipedulikan strategi untuk melakukan yang lebih efisien atau lebih cepat, dengan niatan menghasilkan hasil yang lebih *straightforward* dan lebih cepat jadi. Tahapan algoritma program yang disusun adalah,

1. Melakukan iterasi setiap sel dalam matriks huruf
2. Melakukan iterasi setiap arah yang dapat dituju (terdapat 8 arah, 2 vertikal, 2 horizontal dan 4 diagonal).
3. Melakukan penambahan indeks sesuai arah jika huruf sesuai dengan urutan karakter dalam kata
4. Lewatkan pengecekan ke arah tersebut jika indeks melewati batas
5. Lewatkan pengecekan ke arah tersebut jika huruf tidak sesuai
6. Jika pertambahan indeks berjumlah sesuai dengan panjang teks, buat matriks boolean baru berisikan false selain pada posisi kata yang telah ditemukan
7. Untuk pencetakan, iterasi setiap sel pada matriks huruf dan tulis "-" jika dalam matriks boolean berisi false dan huruf pada matriks huruf jika dalam matriks boolean berisi true

Source Code

```
import java.io.File;
import java.io.FileNotFoundException;
import java.util.ArrayList;
import java.util.Scanner;

public class wordplay {

    public static final int[][] direction = {
        {0, 1},
        {1, 1},
        {1, 0},
        {1, -1},
        {0, -1},
        {-1, -1},
        {-1, 0},
        {-1, 1}
    };

    public static class SearchResult {

        public double time;
        public boolean found;
        public int count;
        public boolean[][] resmat;
        public String word;

        public SearchResult(String word, double time, boolean found, int count, boolean[][] resmat)
        {
            this.word = word;
            this.time = time;
            this.found = found;
            this.count = count;
            this.resmat = resmat;
        }

        public void show(ArrayList<ArrayList<String>> mat) {
            System.out.println();
            System.out.println("Word: " + this.word);
            System.out.println();
            if (found){
                for (int i = 0; i < mat.size(); i++) {
                    for (int j = 0; j < mat.get(i).size(); j++) {
                        if (this.resmat[i][j]) {
                            System.out.print(mat.get(i).get(j));
                        }
                    }
                }
            }
        }
    }
}
```

```
        } else {
            System.out.print("-");
        }
        System.out.print(" ");
    }
    System.out.println();
}
} else {
    System.out.println("Word not found");
    System.out.println();
}

System.out.println(String.format("Time taken: %.3f ms", time));
System.out.println(String.format("Comparison count: %d", count));
System.out.println();
}
}

public static class Word {

    public String word;

    public Word(String word) {
        this.word = word;
    }

    public SearchResult search(ArrayList<ArrayList<String>> mat) {
        long startTime = System.nanoTime();
        int count = 0;
        int counter = 0;
        boolean found = false;
        boolean[][] resmat = new boolean[mat.size()][mat.get(0).size()];
        matrixloop:
        for (int n = 0; n < mat.size(); n++) {
            for (int m = 0; m < mat.get(n).size(); m++) {
                for (int[] dir : direction) {
                    counter = 0;
                    while (true) {
                        try {
                            count += 1;
                            if (mat.get(n + dir[1] * counter).get(m + dir[0] *
counter).equals(Character.toString(word.charAt(counter)))) {
                                counter += 1;
                            } else {
                                break;
                            }
                        }
                    }
                }
            }
        }
    }
}
```

```
        if (counter == this.word.length()) {
            found = true;
            for (int i = 0; i < this.word.length(); i++){
                resmat[n + dir[1] * i][m+dir[0] * i] = true;
            }
            break matrixloop;
        }
    } catch (Exception e) {
        count -= 1;
        break;
    }
}

}

}

return new SearchResult(
    this.word,
    ((double) (System.nanoTime() - startTime)/1000000),
    found,
    count,
    resmat
);
}

@Override
public String toString() {
    return this.word;
}
}

public static ArrayList<ArrayList<String>> mat;
public static ArrayList<Word> words;

public static void main(String args[]) {
    // Cek jumlah argumen
    System.out.println(wordplay.class.getName());
    int count = args.length;
    if (count == 0) {
        System.out.println("Missing argument : Text Filename");
        return;
    } else if (count > 1) {
        System.out.println("Too many arguments");
        return;
    }
}
```

```
// Pembacaan File
boolean wordFlag = false;
words = new ArrayList<Word>();
mat = new ArrayList<ArrayList<String>>();
mat.add(new ArrayList<String>());
int y = 0;

File f = new File(args[0]);
try {
    Scanner in = new Scanner(f);
    while (in.hasNextLine()) {
        String[] line = in.nextLine().split(" ");
        for (String word : line) {
            if (word.equals("")) {
                wordFlag = true;
            } else {
                if (wordFlag) {
                    words.add(new Word(word));
                } else {
                    mat.get(y).add(word);
                }
            }
        }
        if (!wordFlag) {
            mat.add(new ArrayList<String>());
            y += 1;
        }
    }
    in.close();
} catch (FileNotFoundException e) {
    System.out.print("File not found");
}

// Main Program
for (int i = 0; i < words.size(); i++) {
    SearchResult res = words.get(i).search(mat);
    res.show(mat);
}
}
```

Hasil Implementasi

Test case 1 (Large)

Sampel

Z
L
R
K
X
W
H
K
S
E
J
E
J
G
S
U
M
V
U
V
L
P
S
C
H
W
U
I
R
I
S
Q
A
C
H
R
D
H
K
M

BEYDAJNYSPEAAEFNH EEIFSEBSNCOR
LVZBMJCZLRSQCLNANOSSTVFCUXNNRC
RIGILKENTUMSRNMBYRYUREQP NRP RYK
KTZAGSYTECCFUIEIEYACHUOAMRFNCI
XUQTHIPGXZAXLHFAHBMONWUHQOYCD
WLQJYQLTISDYIARFLPF PARZQVPITPQ
HGXYGETRFGQVMGADEL CWXP FZGVYST
KPAETQTOKQFANRMFNGTATQNDQKMC LA
SJOENAVBZCDQTOHTKYOLCWEZGAUJAP
EZBCLBNFHQMNF LWRONWSWIAXJB NYEV
JHDLGN YFOGTHBKT BROVIOUDRBEXLSJ
GXEVB CUJJTXQZJABMARHCGFUZQLUZL
BBSRWDTEBUOORAMDFEXTWYDDSAVHDK
SERATNAELNATHMKIGY MAYEKJLNYLZW
KYS SGUUMJCCSX D YHGMSONRSOYNPPIYS
MVEQBWF FUGTVLEGIROFWENUREXVUXS
UMRLPHYRBAZE CMOCRU SIGEQOKUMTVH
VLPGQDFAUULGJYTRAMI AU FANULCPGB
SAMYDQXHAKNAPTQTNCTULEYYSLZNWU
UURTQFXL KXHD LZKFUXILUDQB JO PERM
ICQC PW DSTHADARDBQ NYPSAQTVPTJUN
RSRCTEQPOVZNGGJSQTRHSXLALUAHSG
IYBGBUAFHWHATGAJMRGRPEXTHVVS NL
SQSAZARZVPMNQ SMRSLNX PWD PADPXHW
CHRJLIJUTYOJQLSRMFPAVPLDRILUZ R
WAWNPLRDSNNCCKRMEODDKKKOFTRJ BX
NGAUWFYUWQLCSWDBAHCPREJVP SLBAR
UILDMUVXS VVQIZPAAZWKJYQQXHADEN
RDHUKRTS FUBMYRQRRKDZYRGUMMUUYG
KM FHZFWZQFWZFWAHGEP OPXT OI OH DGG

ACRUX
ADHARA
ALDEBARAN
ALNAIR
ALNILAM
ALTAIR
ANTARES
ARCTURUS
BELLATRIX

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BETELGEUSE
CANOPUS
ELNATH
FOMALHAUT
HADAR
MIAPLACIDUS
MIMOSA
POLLUX
PROCYON
REGULUS
RIGEL
RIGILKENT
SHAULA
SIRIUS
SPICA
VEGA

Hasil

wordplay

Word: ACRUX

A
C
R
U
X

```
Time taken: 2.032 ms
Comparison count: 107
```

Word: ADHARA

```
Time taken: 5.847 ms
Comparison count: 6312
```


Word: ALDEBARAN

A
 L
 D
 E
 B
 A
 R
 A
 N

```
Time taken: 6.240 ms
Comparison count: 4685
```

Word: ALNAIR

[illegible]

```
- - - - - A - - - - -  
- - - - - L - - - - -  
- - - N - - - - -  
- - A - - - - -  
- I - - - - -  
R - - - - -  
- - - - -
```

Time taken: 5.140 ms
Comparison count: 5953

Word: ALNILAM

```
- - - - - A - - - - -  
- - - - - L - - - - -  
- - - - - N - - - - -  
- - - - - I - - - - -  
- - - - - L - - - - -  
- - - - - A - - - - -  
- - - - - M - - - - -
```

Time taken: 1.697 ms
Comparison count: 122

Word: ALTAIR

A

L

T

A

I

R

```
Time taken: 9.355 ms
Comparison count: 5288
```

Word: ANTARES

S E R A T N A

```
Time taken: 7.056 ms
Comparison count: 3386
```

Word: ARCTURUS

[illegible]

```
Time taken: 5.463 ms
Comparison count: 4604
```

Word: BELLATRIX

[illegible]

[illegible]

```
Time taken: 3.172 ms
Comparison count: 3024
```

Word: BETELGEUSE

[illegible]

```
Time taken: 2.485 ms
Comparison count: 2238
```

Word: CANOPUS

A 20x20 grid of dots on a black background. The letters S, U, P, O, N, A, and C are arranged in a vertical line, each centered within a 2x2 block of dots. S is at the top, followed by U, P, O, N, A, and C at the bottom.

```
Comparison count: 1682
```

Word: ELNATH

[illegible]

```
Comparison count: 3360
```

Word: FOMALHAUT

	T	
	U	

A 20x20 grid of dots. The letters are placed at the following intersections (row, column) starting from the top-left:

- A: (1, 16)
- H: (2, 12)
- L: (3, 12)
- A: (4, 12)
- M: (5, 12)
- O: (6, 12)
- F: (7, 10)

```
Time taken: 4.120 ms
Comparison count: 2372
```

Word: HADAR

H A D A R

Time taken: 3.767 ms
Comparison count: 5034

Word: MIAPLACIDUS

M

I

A

P

L

A

C

I

D

U

S

```
Time taken: 0.278 ms
Comparison count: 622
```

Word: MIMOSA

```
Time taken: 1.449 ms
Comparison count: 3084
```

Word: POLLUX

X
U
L
L
O
P

```
Time taken: 2.863 ms
```

```
Comparison count: 5173
```

Word: PROCYON

- - - - - N - - - - -
 - - - - - O - - - - -
 - - - - - Y - - - - -
 - - - - - C - - - - -
 - - - - - O - - - - -
 - - - - - R - - - - -

P

Time taken: 1.353 ms
Comparison count: 1698

Word: REGULUS

R

E

[illegible]

```
Time taken: 2.172 ms
Comparison count: 3693
```

Word: RIGEL

L E G I R

Time taken: 1.558 ms
Comparison count: 3918

Word: RIGILKENT

R I G I L K E N T

Time taken: 1.552 ms
Comparison count: 512

Word: SHAULA

- - - - - A L U A H S -

```
Time taken: 5.769 ms
Comparison count: 5502
```

Word: SIRIUS

S
U
I
R
I
S

Time taken: 5.721 ms
Comparison count: 5771

Word: SPICA

A

C

I

P

S

```
Time taken: 2.803 ms
Comparison count: 5430
```

Word: VEGA

V
E
G
A

```
- - - - -  
Time taken: 1.177 ms  
Comparison count: 3789
```

Test case 2 (Large)

Sampel

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

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AGNESDIGITAL
AGNESTACHYON
AIRGROOVE
BIWAHAYAHIDE
CURRENCHAN
DAIWASCARLET
EISHINFLASH
ELCONDORPASA
FINEMOTION
FUJIKISEKI
GOLDCITY
GOLDSHIP
GRASSWONDER
HARUURARA
HISHIAKEBONO
HISHIAMAZON
INESFUJIN
KAWAKAMI PRINCESS
KINGHALO

Hasil

wordplay

Word: AGNESDIGITAL

[illegible]

```
Time taken: 2.037 ms
Comparison count: 780
```

Word: AGNESTACHYON

[illegible]

```
Time taken: 1.529 ms
Comparison count: 4830
```

Word: AIRGROOVE

```
Time taken: 2.742 ms
Comparison count: 9610
```

Word: BIWAHAYAHIDE

E
D
I
H
A
Y
A
H
A
W
I
B

```
Time taken: 1.976 ms
Comparison count: 6924
```

Word: CURRENCHAN

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	H	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-

```
Time taken: 2.108 ms
Comparison count: 6398
```

Word: DAIWASCARLET

[illegible]

```
Time taken: 1.804 ms
Comparison count: 7629
```

Word: EISHINFLASH

----- E I S H I N F L A S H -----

Time taken: 3.408 ms
Comparison count: 9707

Word: ELCONDORPASA

----- E -----
----- L -----
----- C -----
----- O -----
----- N -----
----- D -----
----- O -----
----- R -----
----- P -----
----- A -----
----- S -----
----- A -----

Time taken: 0.044 ms
Comparison count: 174

Word: FINEMOTION

F
I
N
E
M
O
T
I
O
N

Time taken: 0.420 ms
Comparison count: 2364

Word: FUJIKISEKI

- - - - - F - - - - -
- - - - - U - - - - -
- - - - - J - - - - -
- - - - - I - - - - -
- - - - - K - - - - -
- - - - - I - - - - -
- - S - - - - -
- - E - - - - -
- K - - - - -
I - - - - -

```
Time taken: 0.491 ms
Comparison count: 2882
```

Word: GOLDCITY

Y T I C D L O G

```
Time taken: 1.819 ms
Comparison count: 9183
```

Word: GOLDSHIP

P
- I
- H
- S
- D
- L
- O
- G

```
Time taken: 0.225 ms
Comparison count: 2033
```

Word: GRASSWONDER

[illegible]

```
Time taken: 0.474 ms
Comparison count: 5979
```

Word: HARUURARA

[illegible]

```
Time taken: 0.301 ms
Comparison count: 2496
```

Word: HISHIAKEBONO

- - - - - H I S H I A K E B O N O - - - - -


```
Time taken: 0.081 ms
Comparison count: 1241
```

Word: HISHIAMAZON

A large grid of dashed lines forming a coordinate system.

Time taken: 0.403 ms
Comparison count: 2180

Word: INESFUJIN

I
N
E
S
F
U
J
I
N

```
Time taken: 1.323 ms
Comparison count: 3588
```

Word: KAWAKAMIPRINCESS

[illegible]

```
Time taken: 0.113 ms
Comparison count: 2473
```

Word: KINGHALO

- - - - - O L A H G N I K

```
Time taken: 0.401 ms
```

Comparison count: 1895

Test case 3 (Medium)

Sampel

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

ALBANIA
GERMANY
NORWAY
ANDORRA
GREECE
POLAND
ARMENIA
HUNGARY
PORTUGAL
AUSTRIA
ICELAND
ROMANIA
AZERBAIJAN
IRELAND
RUSSIA

Rifqi Naufal Abdjul
13520062

BELARUS
ITALY
SANMARINO
BELGIUM
KAZAKHSTAN
SERBIA
BOSNIAHERZEGOVINA

Hasil

wordplay

Word: ALBANIA

A 20x20 grid of dashed lines. The letters are placed at the following intersections (row, column):

- A: (12, 12)
- L: (13, 13)
- B: (14, 14)
- A: (15, 15)
- N: (16, 16)
- I: (17, 17)
- A: (18, 18)

Time taken: 3.334 ms

```
Comparison count: 2273
```

Word: GERMANY

[illegible]

[illegible]

```
Time taken: 0.664 ms
Comparison count: 3321
```

Word: NORWAY

A 20x20 grid of dashed lines. The letters are placed at the following intersections (row, column):

- N: (1, 10)
- O: (2, 10)
- R: (3, 10)
- W: (4, 10)
- A: (5, 10)
- Y: (6, 10)

```
Time taken: 1.798 ms
Comparison count: 1736
```

Word: ANDORRA

ARRONA

```
Time taken: 3.824 ms
Comparison count: 4056
```

Word: GREECE

A 20x20 grid of dots. The letters are placed at the following (row, column) coordinates (starting from 0 at the top-left):

- G: (1, 12)
- R: (2, 14)
- E: (3, 16)
- E: (4, 18)
- C: (5, 19)
- E: (6, 17)


```
Time taken: 0.050 ms
Comparison count: 288
```

Word: POLAND

A large grid of small squares, resembling a graph paper or a data table. The grid is composed of many small squares arranged in rows and columns. The text "D N A L O P" is repeated across the top row of the grid, with spaces between the letters. The grid is mostly empty, with only the text visible in the top row.

```
Time taken: 0.345 ms
Comparison count: 159
```

Word: ARMENIA

[illegible]

```
Time taken: 2.357 ms
Comparison count: 3918
```

Word: HUNGARY

```
- - - - - Y - - - - -  
- - - - -  
- - - - -
```

Time taken: 0.600 ms
Comparison count: 2336

Word: PORTUGAL

```
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- - - - -  
- - - - -  
- - - - - P - -  
- - - - - O - -  
- - - - - R - -  
- - - - - T - -  
- - - - - U - -  
- - - - - G - -  
- - - - - A - -  
- - - - - L - -  
- - - - -
```

Time taken: 0.692 ms
Comparison count: 2496

Word: AUSTRIA

```
- - - - -  
- - - - -  
- - - - - A - - - - -  
- - - - - I - - - - -  
- - - - - R - - - - -  
- - - - - T - - - - -  
- - - - - S - - - - -  
- - U - - - - -
```

A

```
Time taken: 1.684 ms
Comparison count: 1591
```

Word: ICELAND

A full-page sheet of graph paper featuring a uniform grid of small squares. The grid consists of approximately 20 columns and 20 rows of squares, creating a coordinate plane suitable for plotting graphs or drawing geometric shapes.

```
Time taken: 1.219 ms
Comparison count: 2732
```

Word: ROMANIA

R O M A N I A

```
Time taken: 0.778 ms
Comparison count: 1550
```

Word: AZERBAIJAN

N

A

J

[illegible]

```
Time taken: 3.436 ms
Comparison count: 4237
```

Word: IRELAND

A 20x20 grid of dots on a black background. The dots are arranged to form the letters 'I', 'R', 'E', 'L', 'A', 'N', and 'D' in a staggered, non-adjacent pattern. The letters are composed of dots that are not directly adjacent to each other, creating a sparse, pixelated effect.

```
Time taken: 0.871 ms
Comparison count: 2277
```

Word: RUSSIA

$$\mathbb{R}$$

U
S
S
I
A

Time taken: 0.509 ms
Comparison count: 651

Word: BELARUS

B
E
L
A
R
U
S

```
Time taken: 0.070 ms
Comparison count: 383
```

Word: ITALY

I
T
A
L
Y

```
Time taken: 0.127 ms
Comparison count: 342
```

Word: SANMARINO

— O N I R A M N A S —


```
Time taken: 0.768 ms
Comparison count: 1236
```

Word: BELGIUM

										M			
										U			
									I				
								G					
							L						
						E							
					B								

```
Time taken: 0.556 ms
Comparison count: 2832
```

Word: KAZAKHSTAN

[illegible]

```
Time taken: 0.365 ms
Comparison count: 2083
```

Word: SERBIA

-	-	-	-	-	-	-	-	-	S	-	-	-
-	-	-	-	-	-	-	-	E	-	-	-	-
-	-	-	-	-	-	-	R	-	-	-	-	-
-	-	-	-	-	-	B	-	-	-	-	-	-
-	-	-	-	-	I	-	-	-	-	-	-	-
-	-	-	-	A	-	-	-	-	-	-	-	-

```
Time taken: 0.409 ms
Comparison count: 334
```

Word: BOSNIAHERZEGOVINA

- B O S N I A H E R Z E G O V I N A - - - -

```
Time taken: 0.343 ms
Comparison count: 1670
```

Test case 4 (Medium)

Sampel

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

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

- ALBANY
- DOVER
- OKLAHOMACITY
- ANNAPOLIS
- FRANKFORT
- OLYMPIA
- ATLANTA
- HARRISBURG
- PHOENIX
- AUGUSTA
- HARTFORD
- PIERRE
- AUSTIN
- HELENA
- PROVIDENCE
- BATONROUGE
- HONOLULU
- RALEIGH
- BISMARCK

Hasil

wordplay

Word: ALBANY

- - - - -

```
- - - - - A - - -  
- - - - - L - - -  
- - - - - B - - -  
- - - - - A - - -  
- - - - - N - - -  
- - - - - Y - - -
```

Time taken: 2.565 ms
Comparison count: 810

Word: DOVER

- - - - - R E V O D - - - - -

Time taken: 1.443 ms
Comparison count: 3755

Word: OKLAHOMACITY

- - - - - Y - - - - -
- - - - - T - - - - -
- - - - - I - - - - -
- - - - - C - - - - -
- - - - - A - - - - -
- - - - - M - - - - -
- - - - - O - - - - -
- - - - - H - - - - -
- - - - - A - - - - -
- - - - - L - - - - -
- - - - - K - - - - -
- - - - - O - - - - -

Time taken: 2.668 ms
Comparison count: 3379

Word: ANNAPOLIS

[illegible]

```
Time taken: 3.022 ms
Comparison count: 4866
```

Word: FRANKFORT

FRANKFORT

```
Time taken: 0.082 ms
Comparison count: 477
```

Word: OLYMPIA

```
Time taken: 2.121 ms
Comparison count: 3828
```

Word: ATLANTA

-	-	-	-	-	-	-	I	-	-	-	-	-	-	-
-	-	-	-	-	-	-	R	-	-	-	-	-	-	-
-	-	-	-	-	-	-	R	-	-	-	-	-	-	-
-	-	-	-	-	-	A	-	-	-	-	-	-	-	-
-	-	-	-	-	H	-	-	-	-	-	-	-	-	-

```
Time taken: 2.039 ms
Comparison count: 4616
```

Word: PHOENIX

A 20x20 grid of dots. The letters P, H, O, E, N, I, and X are placed at the following intersections (row, column): P(10, 10), H(10, 12), O(10, 14), E(10, 16), N(10, 18), I(10, 20), and X(10, 22).

```
Time taken: 0.601 ms
Comparison count: 3446
```

Word: AUGUSTA

[illegible]

[illegible]

```
Time taken: 2.655 ms
Comparison count: 4353
```

Word: HARTFORD

[illegible]

```
Time taken: 0.197 ms
Comparison count: 199
```

Word: PIERRE

A 20x20 grid of dashes with the following letters placed at specific intersections (row, column):

- E at (1, 18)
- R at (2, 17)
- R at (3, 17)
- E at (4, 16)
- I at (5, 15)
- P at (6, 14)

```
Time taken: 0.243 ms
Comparison count: 1354
```

Word: AUSTIN

[illegible]

- - - - - N - - - - -
- - - - - I - - - - -
- - - - - T - - - - -
- - - - - S - - - - -
- - - - - U - - - - -
- - - - - A - - - - -

Time taken: 2.217 ms
Comparison count: 3672

Word: HELENA

- - - - - H - - - - -
- - - - - E - - - - -
- - - - - L - - - - -
- - - - - E - - - - -
- - - - - N - - - - -
- - - - - A - - - - -

```
Comparison count: 1526
```

Word: PROVIDENCE

[illegible]

```
Comparison count: 4383
```

Word: BATONROUGE

----- B -----

A 20x20 grid of dots. The letters are placed at the following intersections (row, column):

- A: (1, 18)
- T: (2, 16)
- O: (3, 17)
- N: (4, 15)
- R: (5, 14)
- O: (6, 13)
- U: (7, 11)
- G: (8, 9)
- E: (9, 7)

```
Time taken: 0.515 ms
Comparison count: 1183
```

Word: HONOLULU

A 20x20 grid of dots. The letters are placed at the following intersections (row, column):

- U: (1, 19), (2, 18), (3, 17), (4, 16), (5, 15), (6, 14), (7, 13), (8, 12), (9, 11), (10, 10), (11, 9), (12, 8), (13, 7), (14, 6), (15, 5), (16, 4), (17, 3), (18, 2), (19, 1), (20, 1)
- L: (1, 18), (2, 17), (3, 16), (4, 15), (5, 14), (6, 13), (7, 12), (8, 11), (9, 10), (10, 9), (11, 8), (12, 7), (13, 6), (14, 5), (15, 4), (16, 3), (17, 2), (18, 1), (19, 1), (20, 1)
- O: (1, 17), (2, 16), (3, 15), (4, 14), (5, 13), (6, 12), (7, 11), (8, 10), (9, 9), (10, 8), (11, 7), (12, 6), (13, 5), (14, 4), (15, 3), (16, 2), (17, 1), (18, 1), (19, 1), (20, 1)
- N: (1, 16), (2, 15), (3, 14), (4, 13), (5, 12), (6, 11), (7, 10), (8, 9), (9, 8), (10, 7), (11, 6), (12, 5), (13, 4), (14, 3), (15, 2), (16, 1), (17, 1), (18, 1), (19, 1), (20, 1)
- H: (1, 15), (2, 14), (3, 13), (4, 12), (5, 11), (6, 10), (7, 9), (8, 8), (9, 7), (10, 6), (11, 5), (12, 4), (13, 3), (14, 2), (15, 1), (16, 1), (17, 1), (18, 1), (19, 1), (20, 1)

```
Comparison count: 1495
```

Word: RALEIGH

[illegible]

```
Comparison count: 399
```

Word: BISMARCK

A 10x10 grid of dots. The letters are placed at the following intersections (row, column) starting from the top-left:

- K: (5, 4)
- C: (6, 4)
- R: (7, 5)
- A: (8, 6)
- M: (9, 7)
- S: (10, 8)
- I: (11, 9)
- B: (12, 10)

```
Time taken: 1.531 ms
```

```
Comparison count: 4624
```

Test case 5 (Medium)

Sampel

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

Rifqi Naufal Abdjul
13520062

ADHERENCE
AMUSE
BIBLICAL
BRAID
BRINY
DISHONEST
FINAL
INERTNESS
INSCRIBED
IRREGULAR
JUNE
PERJURY
PRESCRIBED
RECOVER
SACKING
SHOWER
SOLID
SPATULA
TOTALLY
URUGUAY

Hasil

wordplay

Word: ADHERENCE

E
 C
 N
 E
 R
 E
 H
 D
 A

```
Time taken: 0.933 ms
Comparison count: 2304
```

Word: AMUSE

- - - - - E S U M A - - - - -

```
Time taken: 0.627 ms
Comparison count: 3026
```

Word: BIBLICAL

A large grid of small squares, likely representing a map or a data visualization.

```
- - - - - B
- - - - - L
- - - - - I
- - - - - C
- - - - - A
- - - - - L
```

Time taken: 1.498 ms
Comparison count: 2382

Word: BRAID

```
- - - - -
- - - - -
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- - - - -
- - - - -
- - - - - D -
- - - - - I -
- - - - - A -
- - - - - R -
- - - - - B -
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```

Time taken: 0.941 ms
Comparison count: 1834

Word: BRINY

```
- - - - - B R I N Y
- - - - -
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- - - - -
```

```
Time taken: 0.255 ms
Comparison count: 150
```

Word: DISHONEST

T S E N O H S I D - - - - -

```
Time taken: 1.575 ms
Comparison count: 3579
```

Word: FINAL

```
- - - - - L - - - - -  
- - - - - A - - - - -  
- - - - - N - - - - -  
- - - - - I - - - - -  
- - - - - F - - - - -
```

Time taken: 1.620 ms
Comparison count: 1730

Word: INERTNESS

```
- I N E R T N E S S - - - - -
```

```
Time taken: 0.599 ms
Comparison count: 762
```

Word: INSCRIBED

[illegible]

```
Time taken: 1.371 ms
Comparison count: 2387
```

Word: IRREGULAR

[illegible]

```
Time taken: 0.514 ms
Comparison count: 252
```

Word: JUNE

- - E N U J

```
Time taken: 0.655 ms
Comparison count: 1710
```

Word: PERJURY


```
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- - - - - U - - - - -  
- - - - - J - - - - -  
- - - - - R - - - - -  
- - - - - E - - - - -  
- - - - - P - - - - -  
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- - - - -  
- - - - -
```

Time taken: 1.375 ms
Comparison count: 2809

Word: PRESCRIBED

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P R E S C R I B E D - - - - -  
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```

Time taken: 0.812 ms
Comparison count: 1811

Word: RECOVER

[illegible]

```
Time taken: 0.648 ms
Comparison count: 394
```

Word: SACKING

GNIKCAS

```
Time taken: 2.180 ms
Comparison count: 3494
```

Word: SHOWER

- - - R E W O H S - - - - -

```
Time taken: 0.763 ms
Comparison count: 2815
```

Word: SOLID

[illegible]

```
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Time taken: 0.117 ms  
Comparison count: 609
```

```
Word: SPATULA
```

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- - - - - L - - - - -  
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- - - - - T - - - - -  
- - - - - A - - - - -  
- - - - - P - - - - -  
- - - - - S - - - - -  
- - - - -  
- - - - -  
- - - - -
```

```
Time taken: 1.197 ms  
Comparison count: 3077
```

```
Word: TOTALLY
```

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -
```

- - - - T O T A L L Y - - - -

Time taken: 1.029 ms
Comparison count: 3121

Word: URUGUAY

- U R U G U A Y - - - -

Time taken: 1.280 ms
Comparison count: 2215

Test case 6 (Small)

Sampel

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

```
BABYLOVE
BLUEVELVET
CARAMIA
CHERISH
CRYING
DOWNTOWN
ELENORE
FIRE
GROOVIN
HEATWAVE
HOLIDAY
MEMPHIS
MYGUY
PUPPYLOVE
RUNAWAY
SOULMAN
STAY
TEENANGEL
THETWIST
VALLERI
WHITERABBIT
WINDY
YESTERDAY
```

Hasil

```
wordplay
```

```
Word: BABYLOVE
```

```
- - - - -  
- - - - -  
- - - - - B  
- - - - - A -  
- - - - - B -  
- - - - - Y -  
- - - - - L -  
- - - - - O -  
- - - - - V -  
- - - - - E -  
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```

Time taken: 3.759 ms
Comparison count: 427

Word: BLUEVELVET

```
- - - - -  
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- - T E V L E V E U L B - - - - -  
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```

Time taken: 0.614 ms
Comparison count: 532

Word: CARAMIA

```
- - - - -  
- - - - -  
- - - - -  
- - - - -
```

A I M A R A C - - - - -

Time taken: 1.881 ms
Comparison count: 1843

Word: CHERISH

C H E R I S H - - - - -

Time taken: 0.059 ms
Comparison count: 147

Word: CRYING

- C
- R
- Y


```
- - - - - I
- - - - - N
- - - - - G
- - - - -
- - - - -
```

Time taken: 1.191 ms
Comparison count: 955

Word: DOWNTOWN

Word not found

Time taken: 1.768 ms
Comparison count: 1951

Word: ELENORE

```
- - - - -
- - - - -
- E L E N O R E - - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
```

Time taken: 0.627 ms
Comparison count: 314

Word: FIRE

```
- - - - -
- - - - - E - - -
- - - - - R - - -
- - - - - I - - -
- - - - - F - - -
- - - - -
```

```
Time taken: 0.995 ms
Comparison count: 664
```

Word: GROOVIN

Word not found

```
Time taken: 1.391 ms
Comparison count: 1958
```

Word: HEATWAVE

						H									
						E									
						A									
						T									
								W							
								A							
								V							
										E					

```
Time taken: 1.035 ms
Comparison count: 930
```

Word: HOLIDAY

Word not found

Time taken: 2.085 ms

```
Comparison count: 1980
```

Word: MEMPHIS

[illegible]

```
Time taken: 0.861 ms
```

```
Comparison count: 282
```

Word: MYGUY

A 10x10 grid of dots. The letters are placed at the following intersections (row, column):

- M: (4, 3)
- Y: (3, 6)
- U: (2, 7)
- G: (1, 5)

```
Time taken: 0.860 ms
```

```
Comparison count: 913
```

Word: PUPPYLOVE

[illegible]

```
Time taken: 0.299 ms
Comparison count: 66
```

Word: RUNAWAY

```
Time taken: 0.317 ms
Comparison count: 1042
```

Word: SOULMAN

[illegible]

```
- - - - -  
- - - - -  
- - - - - S -  
- - - - - O -  
- - - - - U -  
- - - - - L -  
- - - - - M -  
- - - - - A -  
- - - - - N -
```

Time taken: 0.959 ms
Comparison count: 1115

Word: STAY

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
Y - - - - -  
- A - - - - -  
- - T - - - - -  
- - - S - - - - -  
- - - - -
```

Time taken: 1.432 ms
Comparison count: 1740

Word: TEENANGEL

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- L - - - - -  
- - E - - - - -  
- - - G - - - - -  
- - - - N - - - - -  
- - - - - A - - - - -  
- - - - - N - - - - -
```

```
- - - - - E - - - - -  
- - - - - E - - - - -  
- - - - - T - - - - -  
- - - - -
```

Time taken: 1.498 ms
Comparison count: 1828

Word: THETWIST

```
- - - - -  
- - - - -  
- - - - -  
- - T - - - - -  
- - H - - - - -  
- - E - - - - -  
- - T - - - - -  
- - W - - - - -  
- - I - - - - -  
- - S - - - - -  
- - T - - - - -  
- - - - -  
- - - - -  
- - - - -
```

Time taken: 0.303 ms
Comparison count: 449

Word: VALLERI

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - - I - - -  
- - - - - R - - -  
- - - - - E - - -  
- - - - - L - - -  
- - - - - L - - -  
- - - - - A - - -  
- - - - - V - - -
```

Time taken: 2.134 ms
Comparison count: 1918

Word: WHITERABBIT

```
- - - - -  
- - - - -  
- - - - - T - -  
- - - - - I - -  
- - - - - B - -  
- - - - - B - -  
- - - - - A - -  
- - - - - R - -  
- - - - - E - -  
- - - - - T - -  
- - - - - I - -  
- - - - - H - -  
- - - - - W - -  
- - - - -
```

Time taken: 1.443 ms
Comparison count: 1816

Word: WINDY

Word not found

Time taken: 2.858 ms
Comparison count: 1976

Word: YESTERDAY

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - - Y - - - -  
- - - - - A - - - -  
- - - - - D - - - -  
- - - - - R - - - -  
- - - - - E - - - -  
- - - - - T - - - -  
- - - - - S - - - -  
- - - E - - - -
```

```
- - Y - - - - - - - - - - -  
- - - - - - - - - - - - - - -
```

Time taken: 3.525 ms
Comparison count: 1733

Test case 7 (Small)

Sampel

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

AMBER

AYAKA

BARBARA

BEIDOU

DIONA

EULA

FISCHL

GANYU

HUTAO

JEAN

KEQING

KLEE

KOKOMI

LISA

NINGGUANG

NOELLE

QIQI

BAAL

SAYU

ROSARIA

SHENHE

SUCROSE

XIANGLING

Rifqi Naufal Abdjul
13520062

YANFEI
YOIMIYA
YUNJIN

Hasil

wordplay

Word: AMBER

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - - A - - - - -  
- - - - - M - - - - -  
- - - - - B - - - - -  
- - - - - E - - - - -  
- - - - - R - - - - -  
- - - - -  
- - - - -
```

Time taken: 4.280 ms

Comparison count: 848

Word: AYAKA

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - - A Y A K A -
```

Time taken: 3.504 ms

Comparison count: 1843

Word: BARBARA

[illegible]

```
Time taken: 0.118 ms
Comparison count: 43
```

Word: BEIDOU

[illegible]

```
Time taken: 0.899 ms
Comparison count: 184
```

Word: DIONA

A 10x10 grid of dots. The dots are arranged in a regular pattern. At the bottom right, there are four labels: 'D' at row 6, column 8; 'I' at row 7, column 9; 'O' at row 8, column 10; and 'N' at row 9, column 10.

```
- - - - - A
- - - - -
- - - - -
```

Time taken: 0.274 ms
Comparison count: 849

Word: EULA

```
- - - - -
- - - - -
- - - - -
- - - - -
- - - - - E U L A -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
```

Time taken: 1.024 ms
Comparison count: 707

Word: FISCHL

```
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - - F I S C H L - - - - -
- - - - -
```

Time taken: 1.057 ms
Comparison count: 1519

Word: GANYU

[illegible]

```
Time taken: 0.293 ms
Comparison count: 912
```

Word: HUTAO

— — — — — H U T A O — — — — —

```
Time taken: 0.117 ms
Comparison count: 385
```

Word: JEAN



J E A N - - - - -

Time taken: 0.886 ms
Comparison count: 1623

Word: KEQING

K - - - - -
E - - - - -
Q - - - - -
I - - - - -
N - - - - -
G - - - - -

Time taken: 0.603 ms
Comparison count: 747

Word: KLEE

- - - - - K - - - -
- - - - - L - - - -
- - - - - E - - - -
- - - - - E - - - -

Time taken: 1.810 ms
Comparison count: 1153

Word: KOKOMI

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - - K O K O M I - - - - -
```

Time taken: 2.657 ms
Comparison count: 1706

Word: LISA

```
- - - - -  
- - - - -  
- - - - -  
- - - - L - - - - -  
- - - - I - - - - -  
- - - - S - - - - -  
- - - - A - - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -
```

Time taken: 0.789 ms
Comparison count: 478

Word: NINGGUANG

```
- - - - -  
- - - - -  
- - - - N - - - - -  
- - - - I - - - - -  
- - - - N - - - - -  
- - - - G - - - - -  
- - - - G - - - - -
```

[illegible]

```
Time taken: 0.785 ms
Comparison count: 345
```

Word: NOELLE

[illegible]

```
Time taken: 0.039 ms
Comparison count: 98
```

Word: QIQI

```
Time taken: 2.314 ms
Comparison count: 1147
```

Word: BAAL

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - B A A L - - - - -  
- - - - -  
- - - - -  
- - - - -
```

Time taken: 3.598 ms
Comparison count: 1238

Word: SAYU

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - S - - - -  
- - - - A - - - -  
- - - - Y - - - -  
- - - - U - - - -  
- - - - -  
- - - - -
```

Time taken: 3.658 ms
Comparison count: 974

Word: ROSARIA

```
- - - - -  
- - - - R O S A R I A - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -
```



```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -
```

Time taken: 2.230 ms
Comparison count: 223

Word: SHENHE

```
- - - - -  
- - - - -  
- - - - - S  
- - - - - H  
- - - - - E  
- - - - - N  
- - - - - H  
- - - - - E  
- - - - -  
- - - - -  
- - - - -  
- - - - -
```

Time taken: 0.634 ms
Comparison count: 462

Word: SUCROSE

```
- - - - -  
- - - - -  
- - - S - - - - -  
- - - - U - - - - -  
- - - - - C - - - - -  
- - - - - R - - - - -  
- - - - - O - - - - -  
- - - - - S - - - - -  
- - - - - E - - - - -  
- - - - -  
- - - - -  
- - - - -
```

Time taken: 0.185 ms
Comparison count: 353

Word: XIANGLING

```
- - - - -  
- - - - -  
- - - - -  
- - - - - X I A N G L I N G -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -
```

Time taken: 0.274 ms
Comparison count: 509

Word: YANFEI

```
- - - - -  
- - - - -  
- - - - -  
- - - - - Y - - - - -  
- - - - - A - - - - -  
- - - - - N - - - - -  
- - - - - F - - - - -  
- - - - - E - - - - -  
- - - - - I - - - - -  
- - - - -  
- - - - -  
- - - - -
```

Time taken: 6.232 ms
Comparison count: 522

Word: YOIMIYA

```
- - - - -  
- - - - -  
- Y - - - - -  
- O - - - - -  
- I - - - - -
```

```
- M - - - - - - - - - - - - - - -  
- I - - - - - - - - - - - - - - -  
- Y - - - - - - - - - - - - - - -  
- A - - - - - - - - - - - - - - -  
- - - - - - - - - - - - - - - -  
- - - - - - - - - - - - - - - -  
- - - - - - - - - - - - - - - -
```

Time taken: 2.925 ms
Comparison count: 311

Word: YUNJIN

```
- - - - - - - - - - - - - - - -  
- - - - - - - - - - - - - - - -  
- - - - - - - - - - - - - - - -  
- - - - - - - - - - - - - - - -  
- - - - - - - - - - Y - - - - -  
- - - - - - - - - - U - - - - -  
- - - - - - - - - - N - - - - -  
- - - - - - - - - - J - - - - -  
- - - - - - - - - - I - - - - -  
- - - - - - - - - - N - - - - -  
- - - - - - - - - - - - - - - -  
- - - - - - - - - - - - - - - -
```

Time taken: 1.962 ms
Comparison count: 704

Test case 8 (Small)

Sampel

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

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

```
AXE
BANE
BATRIDER
BEASTMASTER
BLOODSEEKER
BOUNTY

HUNTER
BREWMASTER
BRISTLEBACK
BROODMOTHER
```

Hasil

```
wordplay
```

```
Word: AXE
```

```
- - - - - A - - - - -
- - - - - X - - - - -
- - - - - E - - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
```

```
Time taken: 2.642 ms
```

```
Comparison count: 54
```

```
Word: BANE
```

```
- - - - -
- - - - -
- - - - -
- - - - -
```

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - - E N A B -  
- - - - -  
- - - - -  
- - - - -  
- - - - -
```

Time taken: 1.706 ms
Comparison count: 1417

Word: BATRIDER

```
R - - - - -  
- E - - - - -  
- - D - - - - -  
- - - I - - - - -  
- - - - R - - - - -  
- - - - - T - - - - -  
- - - - - A - - - - -  
- - - - - B - - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -
```

Time taken: 1.312 ms
Comparison count: 967

Word: BEASTMASTER

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - - R - - - - -  
- - - - - E - - - - -  
- - - - - T - - - - -
```

```
- - - - - S - - - - -  
- - - - - A - - - - -  
- - - - - M - - - - -  
- - - - - T - - - - -  
- - - - - S - - - - -  
- - - - - A - - - - -  
- - - - - E - - - - -  
- - - - - B - - - - -
```

Time taken: 2.977 ms
Comparison count: 1895

Word: BLOODSEEKER

```
- - - - -  
- - - - - R - - - - -  
- - - - - E - - - - -  
- - - - - K - - - - -  
- - - - - E - - - - -  
- - - - - E - - - - -  
- - - - - S - - - - -  
- - - - - D - - - - -  
- - - O - - - - -  
- - O - - - - -  
- L - - - - -  
B - - - - -  
- - - - -  
- - - - -  
- - - - -
```

Time taken: 0.948 ms
Comparison count: 1438

Word: BOUNTY

```
- - - - -  
- - - - -  
- - - - -  
- - - - - B O U N T Y  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -
```

```
Time taken: 0.992 ms
Comparison count: 464
```

Word: HUNTER

[illegible]

```
Time taken: 0.039 ms
Comparison count: 24
```

Word: BREWMASTER

[illegible]

```
- - - - -  
- - - - -  
  
Time taken: 0.109 ms  
Comparison count: 130
```

Word: BRISTLEBACK

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - - K - - - - -  
- - - - - C - - - - -  
- - - - - A - - - - -  
- - - - - B - - - - -  
- - - - - E - - - - -  
- - - - - L - - - - -  
- - - - - T - - - - -  
- - - - - S - - - - -  
- - - - - I - - - - -  
- - - - - R - - - - -  
- - - - - B - - - - -
```

```
Time taken: 2.448 ms  
Comparison count: 1878
```

Word: BROODMOTHER

```
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - - B  
- - - - - R  
- - - - - O  
- - - - - O  
- - - - - D  
- - - - - M  
- - - - - O  
- - - - - T  
- - - - - H  
- - - - - E  
- - - - - R
```


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```
Time taken: 1.468 ms  
Comparison count: 634
```