**LAPORAN TUGAS KECIL I**

**PENYELESAIAN *WORD SEARCH PUZZLE*DENGANALGORITMA *BRUTE FORCE***

Laporan dibuat untuk memenuhi salah satu tugas mata kuliah

IF2211 Strategi Algoritma



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**2022**

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## Algoritma Brute Force

Algoritma penyelesaian word puzzle pertama dilakukan dengan membaca file yang berisi puzzle dan daftar jawaban yang perlu dicari. Pada saat membaca file teks tersebut, program akan membaca puzzle menjadi sebuah *vector of vector of char* dan membaca daftar jawaban menjadi *vector of string*. Lalu, terdapat 3 nested loop untuk mengiterasi karakter satu per satu dalam matriks huruf puzzle tersebut dan dicocokkan dengan urutan daftar jawaban. Ketika mengiterasi sebuah karakter, akan dicek setiap arah dengan menggunakan perulangan perhitungan delta dr dan dc dengan alur sebagai berikut.

* Ketika dr bernilai -1 dan dc bernilai -1, maka akan memanggil prosedur check untuk mengecek arah diagonal kiri bawah dari sebuah karakter,
* Ketika dr bernilai -1 dan dc bernila 0, maka akan memanggil prosedur check untuk mengecek arah horizontal kiri dari sebuah karakter,
* Ketika dr bernilai 0 dan dc bernilai 1, maka akan memanggil prosedur check untuk mengecek arah vertikal atas dari sebuah karakter, dan seterusnya.

Prosedur check akan mengecek kesamaan karakter puzzle dengan karakter jawaban ke-i dengan menggunakan perulangan. Jika out of bounds, maka perulangan akan terhenti dan akan kembali pada program utama untuk lanjut mengecek karakter selanjutnya. Jika tidak out of bounds dan sama, maka akan lanjut mengecek karakter selanjutnya sesuai arah yang sudah ditentukan oleh variabel dr dan dc serta mengubah karakter yang benar sementara menjadi ‘1’ untuk penanda.

Jika benar semua akan lanjut pada perulangan dimana karakter yang bukan ‘1’ akan diubah menjadi ‘-‘ dan mengubah ‘1’ menggunakan karakter asli pada matriks huruf salinan dari matriks awal. Setelah itu, matriks yang hanya menampilkan huruf di puzzle yang sesuai jawaban akan ditampilkan di output.

Algoritma yang digunakan tidak menggunakan sifat heuristik. Langkah dimana komparasi tidak sesuai dan akan dilanjutkan, adalah sebuah *improvement* dimana dapat mengurangi waktu eksekusi dan tetap akurat serta bukan sebuah fungsi heuristik dimana ada tradeoff ketidakakuratan. Program sudah ditest di OS Windows dengan pemrograman C++14.

## Source Program

Menggunakan bahasa pemrograman C++ dengan pertimbangan library yang sudah ada dan runtime yang cepat.

Text

Description automatically generated

Text

Description automatically generated

Text

Description automatically generated

A screenshot of a computer

Description automatically generated with medium confidence

Text

Description automatically generated

## Screenshot Input dan Output

Background pattern

Description automatically generated with medium confidenceTest 1. (Kecil 12x18)

Background pattern

Description automatically generated A screen shot of a computer

Description automatically generated with low confidenceBackground pattern

Description automatically generatedA picture containing light

Description automatically generatedBackground pattern

Description automatically generated

Background pattern

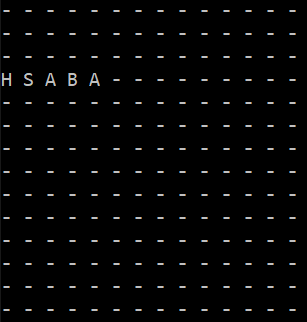
Description automatically generatedBackground pattern

Description automatically generatedText

Description automatically generated

Test 2. (Kecil 14x14)

A picture containing arrow

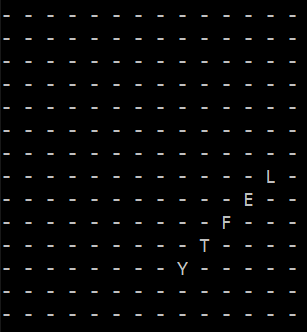
Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedText

Description automatically generated

Test 3. (Kecil 16x16)

A picture containing text, keyboard

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

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Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedText

Description automatically generated

Test 4. (Sedang 20x22)

Background pattern

Description automatically generatedBackground pattern

Description automatically generated

Background pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generated

Background pattern

Description automatically generated with medium confidenceA picture containing text

Description automatically generatedA picture containing background pattern

Description automatically generated

A picture containing background pattern

Description automatically generatedText

Description automatically generated

Test 5. (Sedang 20x20)

A screenshot of a computer

Description automatically generated with medium confidenceBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

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Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedA picture containing text

Description automatically generated

Test 6. (Sedang 24x24)

A picture containing text, keyboard

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

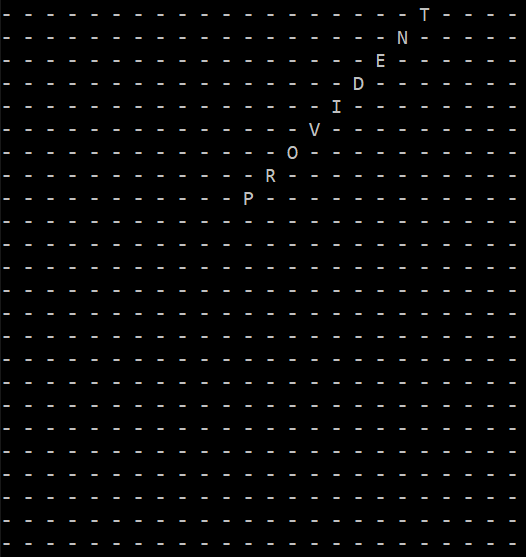
Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generated with low confidence

Test 7. (Besar 34x34)

Background pattern

Description automatically generatedTable

Description automatically generatedA picture containing text

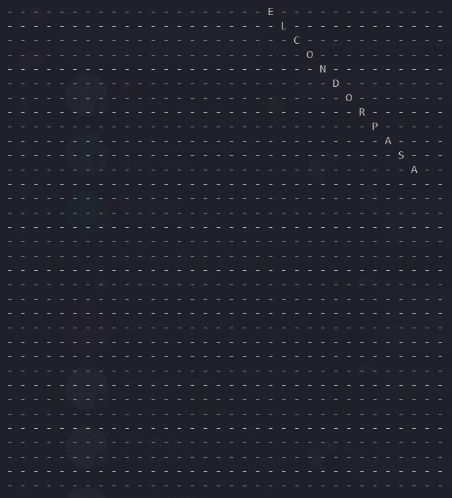
Description automatically generatedBackground pattern

Description automatically generatedA picture containing text

Description automatically generatedBackground pattern

Description automatically generatedA picture containing text

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generated with medium confidenceA picture containing text

Description automatically generatedBackground pattern

Description automatically generated with medium confidenceA picture containing background pattern

Description automatically generatedA picture containing text

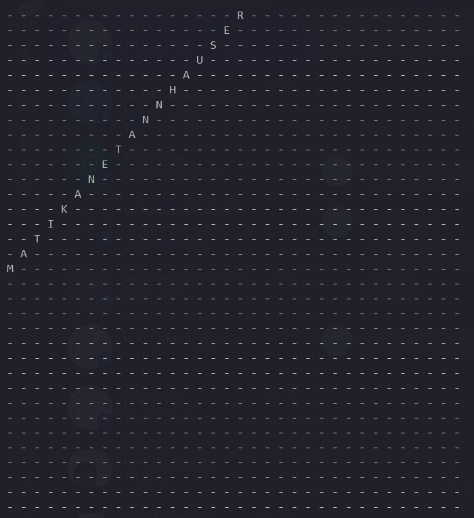
Description automatically generatedA picture containing background pattern

Description automatically generatedA picture containing text

Description automatically generatedA picture containing background pattern

Description automatically generatedA picture containing text, loudspeaker

Description automatically generatedBackground pattern

Description automatically generated with medium confidenceBackground pattern

Description automatically generatedBackground pattern

Description automatically generated with low confidenceBackground pattern

Description automatically generatedA picture containing text

Description automatically generatedA picture containing background pattern

Description automatically generatedA picture containing background pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedA picture containing text

Description automatically generatedBackground pattern

Description automatically generatedA picture containing text

Description automatically generatedBackground pattern

Description automatically generatedA picture containing text

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedA picture containing background pattern

Description automatically generatedA picture containing table

Description automatically generatedBackground pattern

Description automatically generatedA picture containing background pattern

Description automatically generatedBackground pattern

Description automatically generated with low confidenceBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generated with medium confidenceA picture containing background pattern

Description automatically generatedTable

Description automatically generated with medium confidence

Test 8. (Besar 30x30)

A picture containing grater, armor, basement

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedA picture containing building

Description automatically generatedA picture containing plane, grate

Description automatically generatedA picture containing building

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedA picture containing building

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generated with low confidence

Test 9. (Besar 32x32)

Background pattern

Description automatically generatedA picture containing building

Description automatically generatedA picture containing building

Description automatically generatedBackground pattern

Description automatically generatedA picture containing building

Description automatically generatedBackground pattern

Description automatically generatedA picture containing building

Description automatically generatedBackground pattern

Description automatically generatedA picture containing building

Description automatically generatedA picture containing building

Description automatically generatedA picture containing building

Description automatically generatedA picture containing building

Description automatically generatedA picture containing building

Description automatically generatedBackground pattern

Description automatically generatedA picture containing building, window blind

Description automatically generatedA picture containing building

Description automatically generatedA picture containing building

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedA picture containing building

Description automatically generatedA picture containing building

Description automatically generatedBackground pattern

Description automatically generatedA picture containing building, window blind

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedA picture containing building

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedBackground pattern

Description automatically generatedA picture containing building

Description automatically generatedBackground pattern

Description automatically generatedA picture containing text

Description automatically generated

Mohon maaf apabila ukuran tangkapan layar yang diperkecil, hal ini dilakukan agar dapat memangkas jumlah halaman yang ada agar tidak berlebihan.

## Link Drive Kode Program

[*https://drive.google.com/drive/folders/1Z3QIil6msTq7ytK-AV4v5LDk-feMmBO\_?usp=sharing*](https://drive.google.com/drive/folders/1Z3QIil6msTq7ytK-AV4v5LDk-feMmBO_?usp=sharing)

## Checklist

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