Word Search Puzzle (P9)

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GitHub link: https://github.com/pinkeshb/SDES_wordpuzzle/tree/pdev

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Word Search Puzzle (P9) - Project Aim

- Interactive game based on Classic Word Search Puzzle
- Search a set of words embedded in a $N \times N$ matrix of characters

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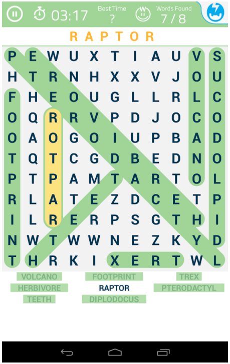
Different features

1. User selectable difficulty levels, Dictionary, Grid Size
2. Score
3. Time limit



03:17 Best Time ? Words Found 7 / 8

RAPTOR

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

VOLCANO FOOTPRINT TREX

HERBIVORE RAPTOR PTERODACTYL

TEETH DIPLODOCUS

Game Specifications

User Input

1. Size of grid - N
2. Difficulty level - Easy, Medium Hard
3. Dictionary - Animals, Cars

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Game parameters

1. Length of longest word, L
2. No. of words
3. Intersection of words, I
4. Display the set of words
5. Random filling of characters

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	Easy	Medium	Hard
	I- No Display - Yes	I- Yes Display - Yes	I- Yes Display - No
N = 8	WL - 6 No.of words =6	WL- 8 No. of words =8	WL - 8 No. of words =8
N = 12	WL - 8 No.of words =8	WL- 10 No. of words =12	WL - 10 No. of words =12

PyGame- GUI , Python - algorithm, Wx - for options widget

Modules

Modules

1. **Options GUI** - Gets input from user
2. **Game Settings** - Stores user input and calculates Game Design parameters
3. **Character Matrix** - holds matrix and get and set word and random fill function
4. **Wordlist**
   - holds word list and strategically populates matrix with words
   - chooses words and places them according to the difficulty levels
5. **Game GUI** - sets up the GAME and monitors the user actions
6. **Game Status** - stores the user game state
   Eg.current - score, time, word found

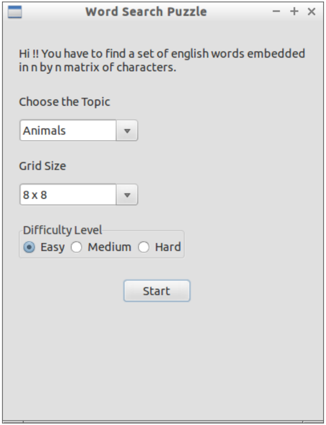
main function - which integrates all and runs the game

Intermediate Work Done

Intermediate Work Done - Until 24th March

- Completed 3 modules with unit testing
    1. Character Matrix
    2. Word List
    3. Game GUI
- Difficulty level 0 - ensuring no overlaps and even spread of words
- GUI with fixed sized window, 2 mouse clicks selects the word

ScreenShots



Word Search Puzzle

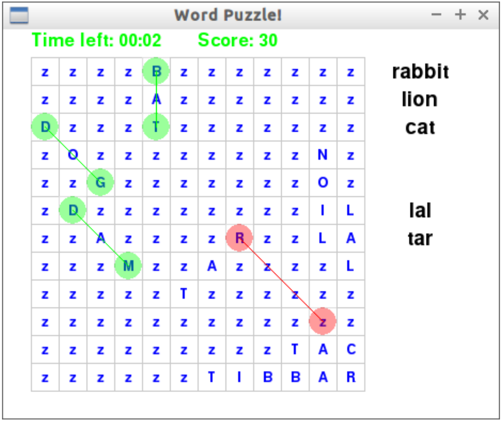
Hi !! You have to find a set of english words embedded in n by n matrix of characters.

Choose the Topic: Animals

Grid Size: 8 x 8

Difficulty Level: ● Easy ○ Medium ○ Hard

Figure : Options Menu



Word Puzzle!

Time left: 00:02 Score: 30

z	z	z	z	B	z	z	z	z	z	z	z
z	z	z	z	A	z	z	z	z	z	z	z
D	z	z	z	T	z	z	z	z	z	z	z
z	O	z	z	z	z	z	z	z	z	N	z
z	z	G	z	z	z	z	z	z	z	O	z
z	D	z	z	z	z	z	z	z	z	I	L
z	z	A	z	z	z	z	R	z	z	L	A
z	z	z	M	z	z	A	z	z	z	z	L
z	z	z	z	z	T	z	z	z	z	z	z
z	z	z	z	z	z	z	z	z	z	z	z
z	z	z	z	z	z	z	z	z	T	A	C
z	z	z	z	z	z	T	I	B	B	A	R

rabbit
lion
cat

lal
tar

Figure : Puzzle Running

Game Flow

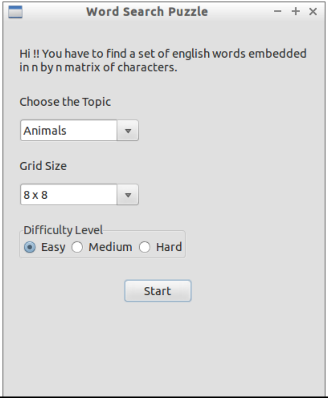
1

Start Options Menu GUI

Game Flow

1

Start Options Menu GUI



Hi !! You have to find a set of english words embedded in n by n matrix of characters.

Choose the Topic

Animals

Grid Size

8 x 8

Difficulty Level

● Easy ○ Medium ○ Hard

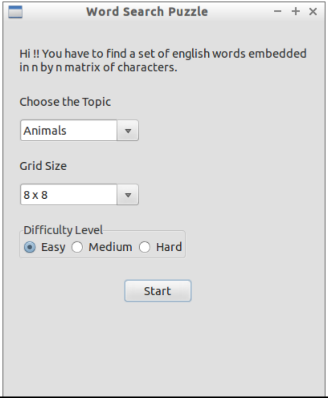
Game Flow

1

Start Options Menu GUI

2

Store in Game Settings



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Game Flow

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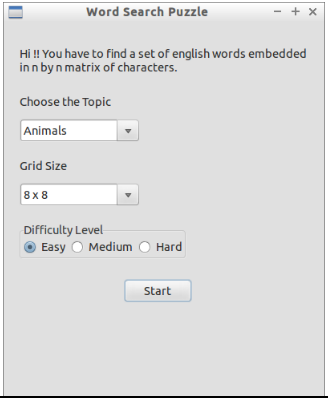
Start Options Menu GUI

2

Store in Game Settings

3

Generate Word List and their Positions



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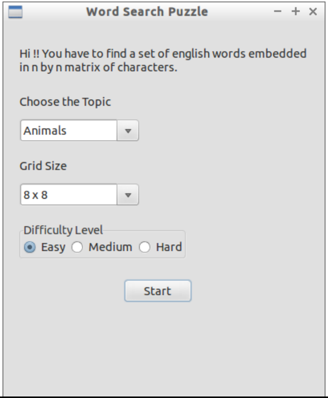
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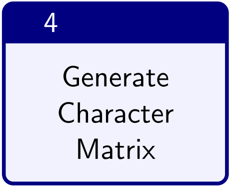
Grid Size: 8 x 8

Difficulty Level: ● Easy ○ Medium ○ Hard

goldfish
hamster
kitten
bear
lion
cow
dog
owl

Game Flow - Continued



4

Generate Character Matrix

Game Flow - Continued

4

Generate Character Matrix

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

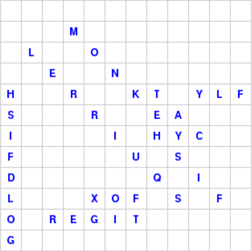
Game Flow - Continued

4

Generate Character Matrix

5

Initialize Game State



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

Game Flow - Continued

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Generate Character Matrix

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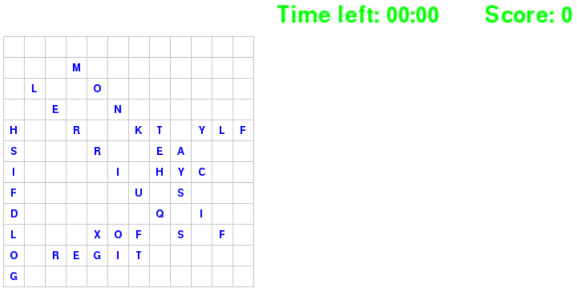
Initialize Game State



Time left: 00:00 Score: 0

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

Game Flow - Continued

4

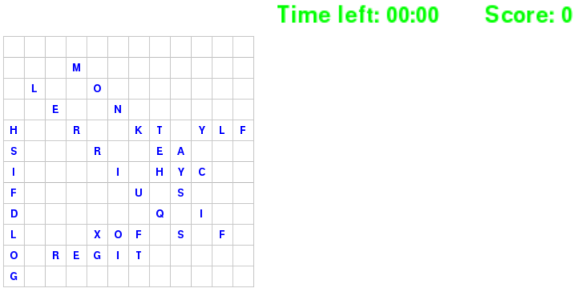
Generate Character Matrix

5

Initialize Game State

6

Start Game GUI



Time left: 00:00 Score: 0

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

Game Flow - Continued

4

Generate Character Matrix

5

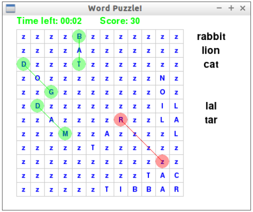
Initialize Game State

6

Start Game GUI

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

Time left: 00:00 Score: 0



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z	z	z	z	B	z	z	z	z	z	z	z
z	z	z	z	A	z	z	z	z	z	z	z
D	z	z	z	T	z	z	z	z	z	z	z
z	O	z	z	z	z	z	z	z	z	N	z
z	z	G	z	z	z	z	z	z	z	O	z
z	D	z	z	z	z	z	z	z	z	I	L
z	z	A	z	z	z	z	R	z	z	L	A
z	z	z	M	z	z	A	z	z	z	z	L
z	z	z	z	z	T	z	z	z	z	z	z
z	z	z	z	z	z	z	z	z	z	z	z
z	z	z	z	z	z	z	z	z	T	A	C
z	z	z	z	z	z	T	I	B	B	A	R

rabbit
lion
cat

lal
tar

Design Strategy

Design Strategy

- MVC -Model View Controller for GAME GUI
- Divide into modules -oop design
- Top down Approach

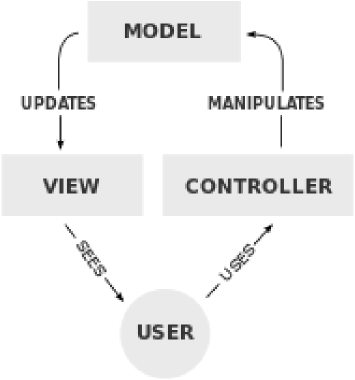

Figure : Model View Controller

Image Source: Wikipedia

Algo Features and Testing

Algo Features

1. Sticky Mouse Postitioning in Game GUI
2. Algorithm to find position of words to be placed.

Testing

- Logic and GUI has been separated as modules and developed separately
- Separation of Concern
- The logic has been tested using unit test.
- Inside the modules, divided into functions and tested individually.

Possible Upgrades

- Enhance User experience - by improving GUI
- Generate More diffuculty levels
- User Memory- store the specific user settings
- level by level unlocking

Resources

1. Word Postitioning Algorithm
   - `http://stackoverflow.com/questions/6332652/a-fast-algorithm-for-creating-a-puzzle`
2. PyGame
   - `inventwithpython.com/pygame/chapter2.html`
3. Wx Widget
   - `http://wiki.wxpython.org/Getting%20Started`
   - `http://zetcode.com/wxpython/`

Thank you