

Word Search Puzzle (P9)

Venkhat V, Pinkesh Barsopia

Department of Electrical Engineering
Indian Institute of Technology Bombay

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

April 29, 2013

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

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

Different features

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



Game Specifications

User Input

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

Game Specifications

User Input

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

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

Game Specifications

User Input

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

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

	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

- 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 - 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

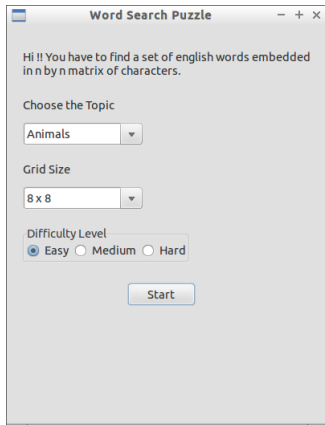


Figure : Options Menu

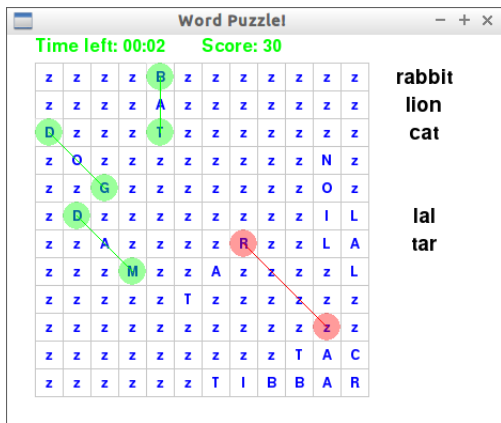


Figure : Puzzle Running

Game Flow

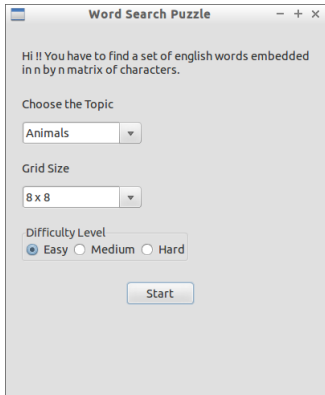
1

Start Options
Menu GUI

Game Flow

1

Start Options
Menu GUI



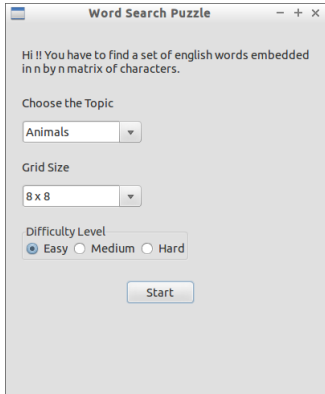
Game Flow

1

Start Options
Menu GUI

2

Store in
Game
Settings



Game Flow

1

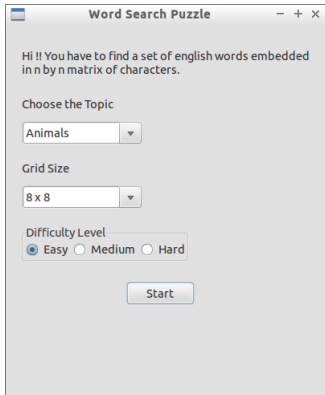
Start Options
Menu GUI

2

Store in
Game
Settings

3

Generate
Word List
and their
Positions



Game Flow

1

Start Options
Menu GUI

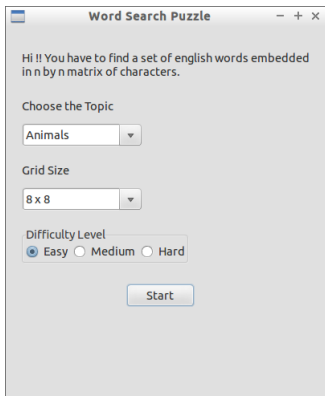
2

Store in
Game
Settings

3

Generate
Word List
and their
Positions

goldfish
hamster
kitten
bear
lion
cow
dog
owl



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

4

Generate
Character
Matrix

5

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

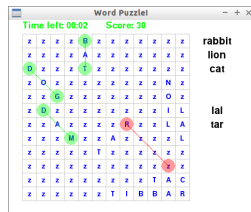
Initialize Game
State

6

Start Game
GUI

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																			



Design Strategy

- mvc -model view controller for GAME GUI
- Divide into modules -oop design
- we followed Top down Approach

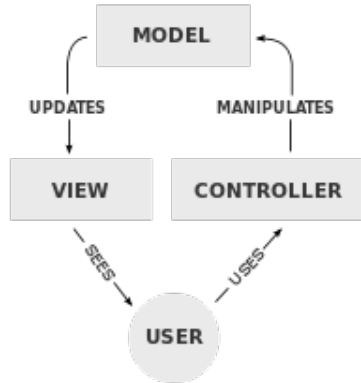


Figure : Model View Controller

Image Source: Wikipedia

Algo Features

- 1 Sticky mouse Positioning 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 difficulty levels
- User Memory- store the specific user settings
- level by level unlocking

① Word Positioning 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/>