Final Java Project Report

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1 Class Descriptions

In total there are twelve classes and three packages. Seven classes were created for the program logic, four classes for the graphical user interface (GUI), and one to read the input information and run the game.

Program logic classes:

- GlobalCells: GlobalCells is an abstract class and all types of cells inherit from this class. All its variables are protected consisting of a cell letter variable and a cell color variable. It also has getter methods for its variables.
- NullCell: NullCells inherits from the abstract GlobalCells class and are the black cells in the crossword. They cannot do much but to have the attribute color black.
- Cell: Cell class is an abstract class which inherits from GlobalCells. It contains the possible letters protected variable, as well as its get method. In addition, it has the methods to insert a letter and change the cell letter variable as well as delete it.
- RegularCell: Inherits from the abstract Cell class and every time the class its instantiated the color value and possible letters variables get assigned.
- HelpCell: Inherits from the abstract Cell class and every time its instantiated it gets assigned 4 random letters and the hint letter to the possibleLetters variable. Its attribute color is set to blue.
- GreySpecialCell: Inherits from the abstract Cell class and every time the class its instantiated the color value and possible letters variables get assigned.
- CellFactory: Class to make an instance of each GlobalCells subclass depending on the string input file

The number of different cell classes permits to update it or expand the functionalities if another type of crossword is ever implemented.

Graphical User Interface (GUI) classes:

- CrossboardPanel: constructs a crossboard panel having as input the crossword Cell class matrix, creating a button for each index. It implements an ActionLister to each button where the action is to call the class Keyboard and create a keyboard window. Only the sub classes of Cell have the button and action listener implemented.
- SolutionPanel: constructs a solution panel having as input the solution Cell class matrix, creating a button for each index. It implements an ActionLister to each button where the action is to call the class Keyboard and create a keyboard window. In addition it implements a check solution button where it compares the values of the cells with the true solution. If the user succeds, a pop up window is shown with a congratulations message, if not, a pop up window stating to try again is shown.

- Keyboard: Creates a frame with letter key buttons and its action listeners, having as input the cell object and button from the crossboard which was pressed. After pressing a key, the attribute cell letter of the object as well as the button is updated.
- InstructionsPanel: creates a panel having as input the clues across and down.

Main

- PlayCrossword: Reads the config.properties file to get the file name and solution stored. Reads the input file and stores the information of crossword grid, instructions,and solution. Afterward, calls the GUI classes to create the three different panels and add it to the main frame. The crossword code is run by instantiating a play crossword class object.

2 Relationship between classes

The abstract class Globalcells is the parent class of all cells sub classes. From there, the abstract class Cell inherits from GlobalCells, and finally, RegularCell, HelpCell, and GreySpecialCell each inherit from the class Cell. The class NullCell inherits from GlobalCells.

On the other hand, both the CrossboardPanel and SolutionPanel GUI classes, call and instantiate the keyboard class. The main class called PlayCrossowrd reads the file input, stores the variables wit the help of a factory class to create an instance of each cell class, and finally, calls the GUI classes and assembles everything in the main frame. The code runs when an instance of the PlayCrossword object class is created and ran.

3 Strengths & Weaknesses

Strengths

- If more classes of cells are ever implemented as crossword variation. There is reusable code in order to create the new classes as there are abstracts classes and sub classes of cells.
- The GUI panels code can be reused as it is compartmentalized each in their own class
- The coding is easier to maintain as each code function has its own class.

Weaknesses

- Error handling was implemented in some parts of the code but there are areas of opportunity.
- The crossword game window and its panels do not respond well when changing the size of the window.
- The instructions panel was implemented as a JPanel with Grid layout even though there are better ways to implement text. The latter due to time constraints.

4 Project Result

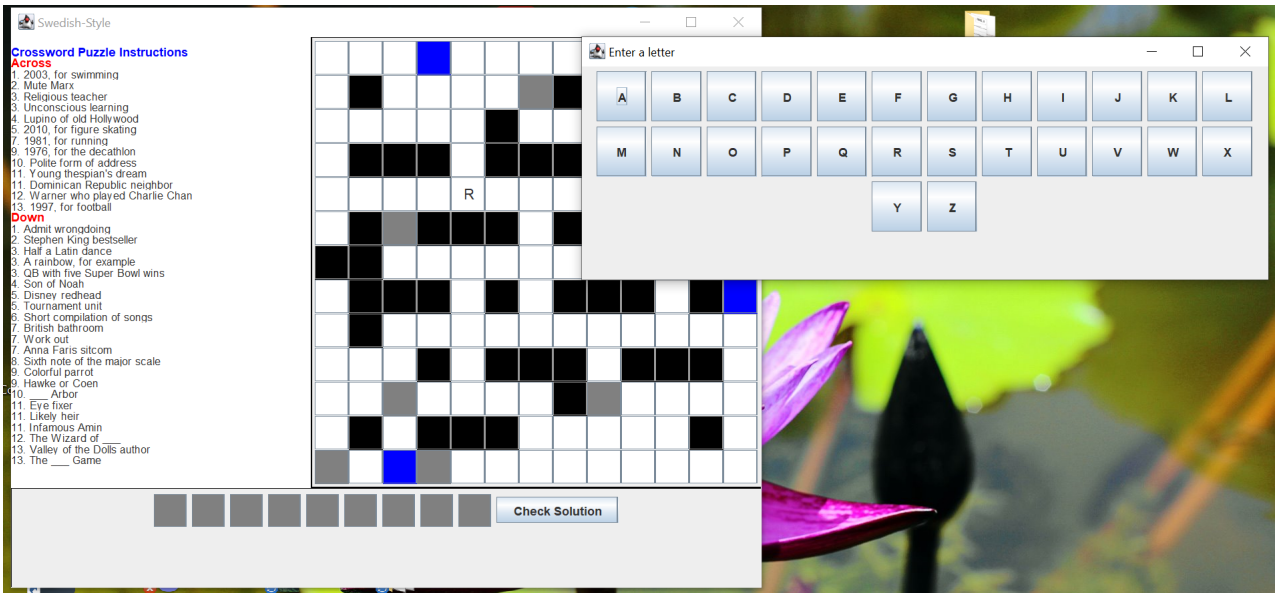

Figure 1: Keyboard window that opens when pressing a cell. When a key is pressed the crossword cell value is updated.

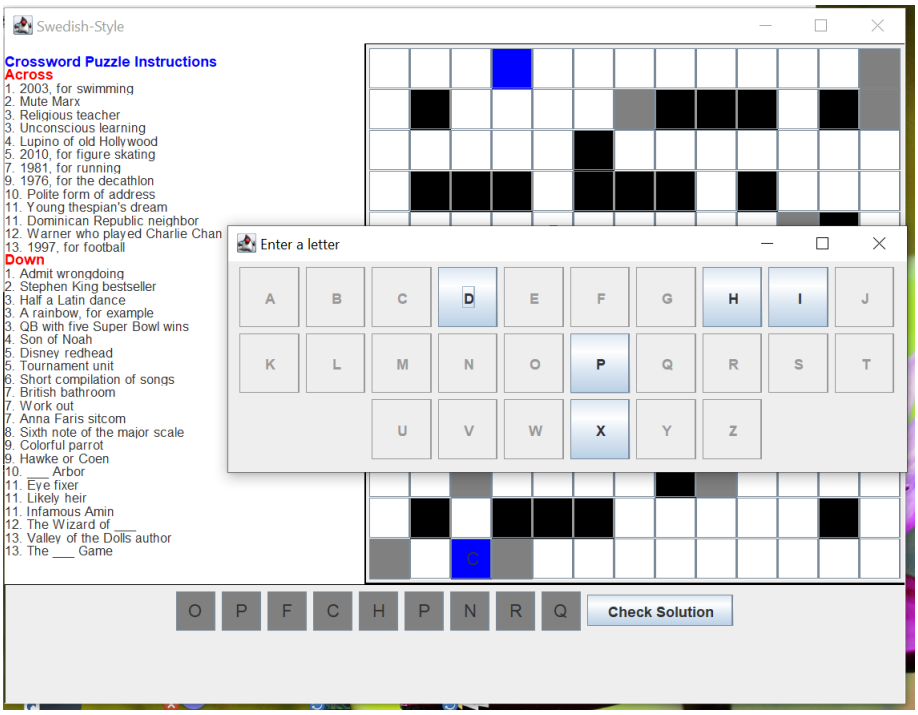

Figure 2: Keyboard window that opens when a blue help cell is clicked

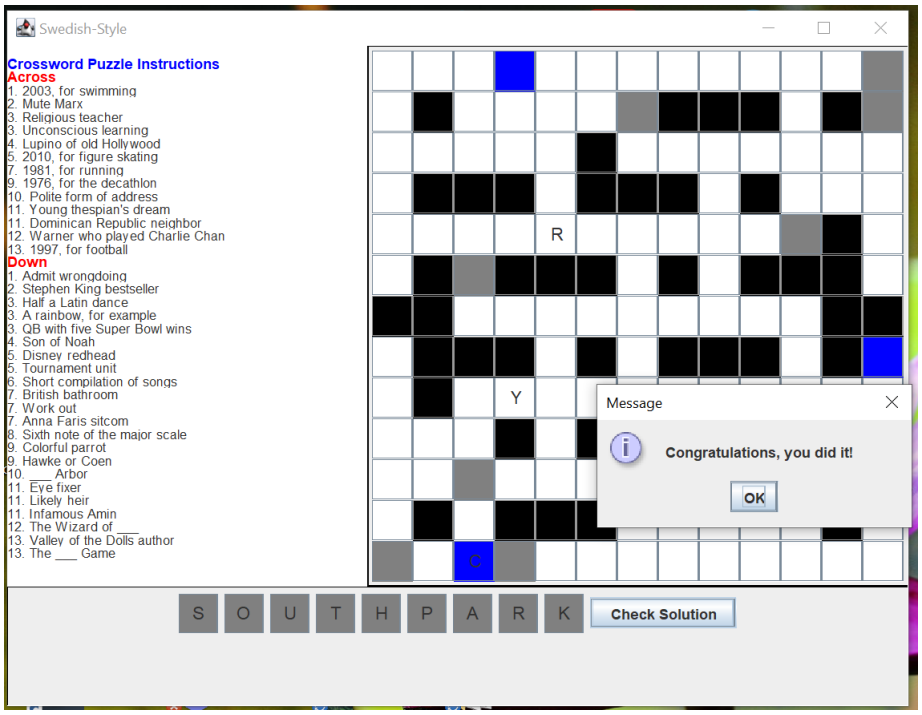

Figure 3: When the solution is guessed or completed correctly

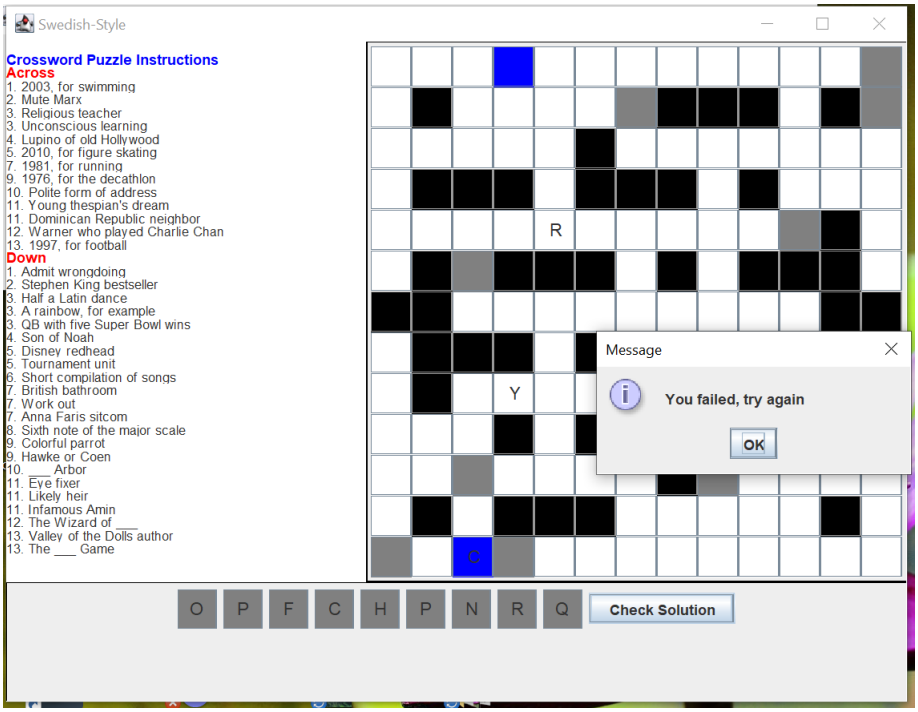

Figure 4: When the solution is guessed or completed wrongly