Object Oriented Programing

Project Documentation

“Sokoban”

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INTRODUCTION

This project is going to be a logic game called sokoban; sokoban is a type of puzzle video game, in which the player pushes objects around in a warehouse or space, trying to get them to certain locations. The sokoban game exercises the brain extensively, and just like physical exercises, sokoban has benefits like: increasing the concentration, reducing the chances of developing Alzheimer, developing the ability of doing things quickly, reducing stress, helping to develop logical thinking patterns, helping to reduce depression and improving sharpness and strategy while approaching and solving problems. In addition to the different types of benefits that sokoban has, I will develop this sokoban game in a Java program, because it will allow me to implement the different concepts, knowledge and skills, that I have learned and developed along the object oriented programming course.

DESCRIPTION OF THE GAME

The sokoban game is played on a board of squares, where each square is a floor or a wall. Some floor squares contain objects, and some floor squares are marked as storage locations. The user or player is confined to a defined board, and may move horizontally or vertically onto empty squares, (never through walls or boxes). The player can also move into an object, which the user can push into the square beyond. The user or player cannot push objects into other objects or into walls, furthermore an object cannot be pulled. The number of boxes is equal to the number of storage locations. The puzzle is solved when all objects are at their corresponding storage locations.

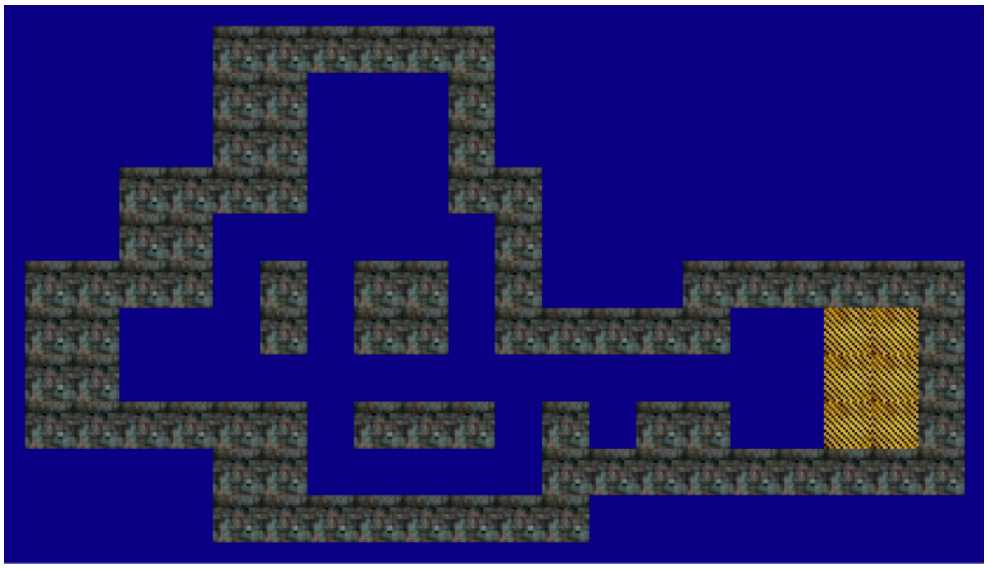
RELEVANT CHARACTERISTICS OF THE GAME

The Sokoban game is going to be composed of: The Graphical User Interface and The Game Structure and Logic.

Graphical Interface:

The graphical interface are all the game elements, that the user sees and interacts with.

Board: The board will show the walls in which the player can move. The user cannot move outside the walls. The board will also have a special area of storage for the objects, (fire balls), this area will be marked with yellow and black.



Light Ball:The light ball is the ball that the user will use to take the other objects, (fire balls), to their storage places. The user will move this ball with the keyboard. This ball can only push one object, (fire ball), at a time. The light ball cannot pull objects.

Fire balls: This balls will appear on the board and the user will have to push them to their special storage area marked with black and yellow.

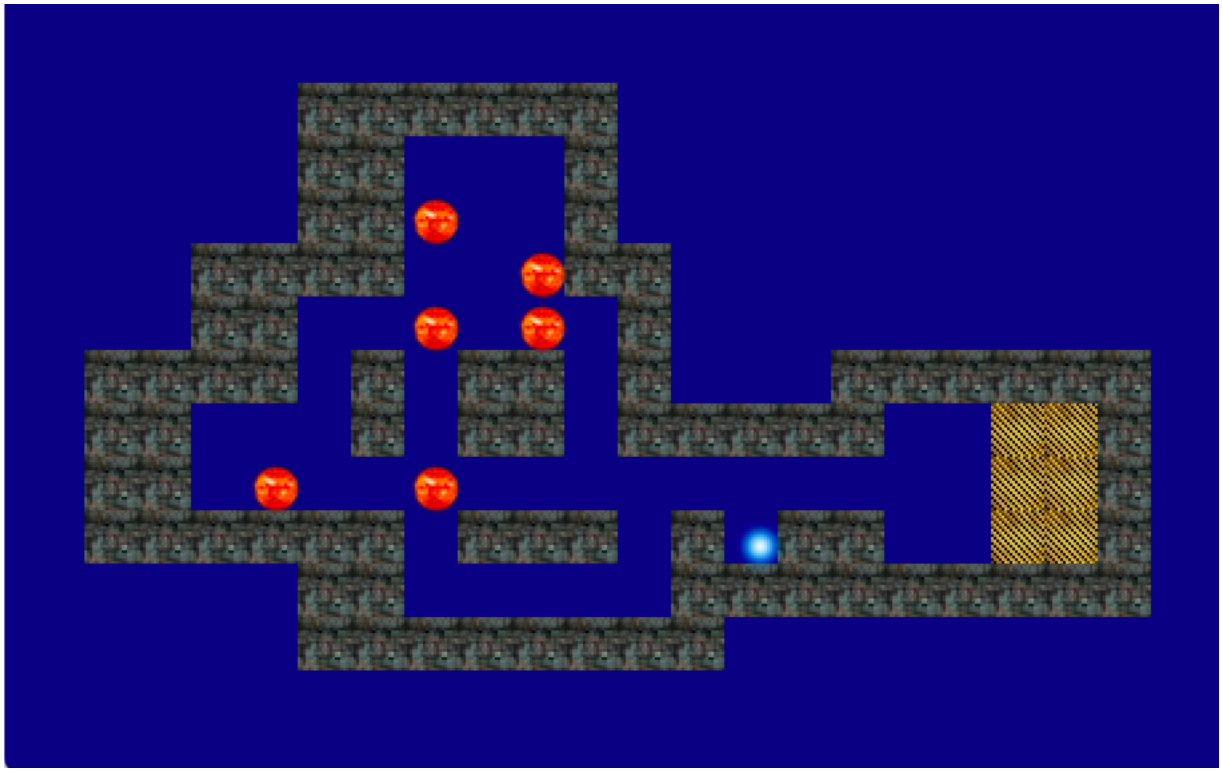
The Game Structure and Logic:

The game structure and logic is the analysis and implementation of the algorithms of the sokoban and its implementation into a java program.

USER INTERACTION WITH THE GAME

The user will interact with the game, by running the program in his or her computer, then the user will try to push all the fire balls to their special storage area, (radioactive area), with the light ball, that moves accordingly to the user instructions with the keyboard. The user cannot push two fire balls at a time and also the user cannot move a fire ball from a corner.

MOCKUP



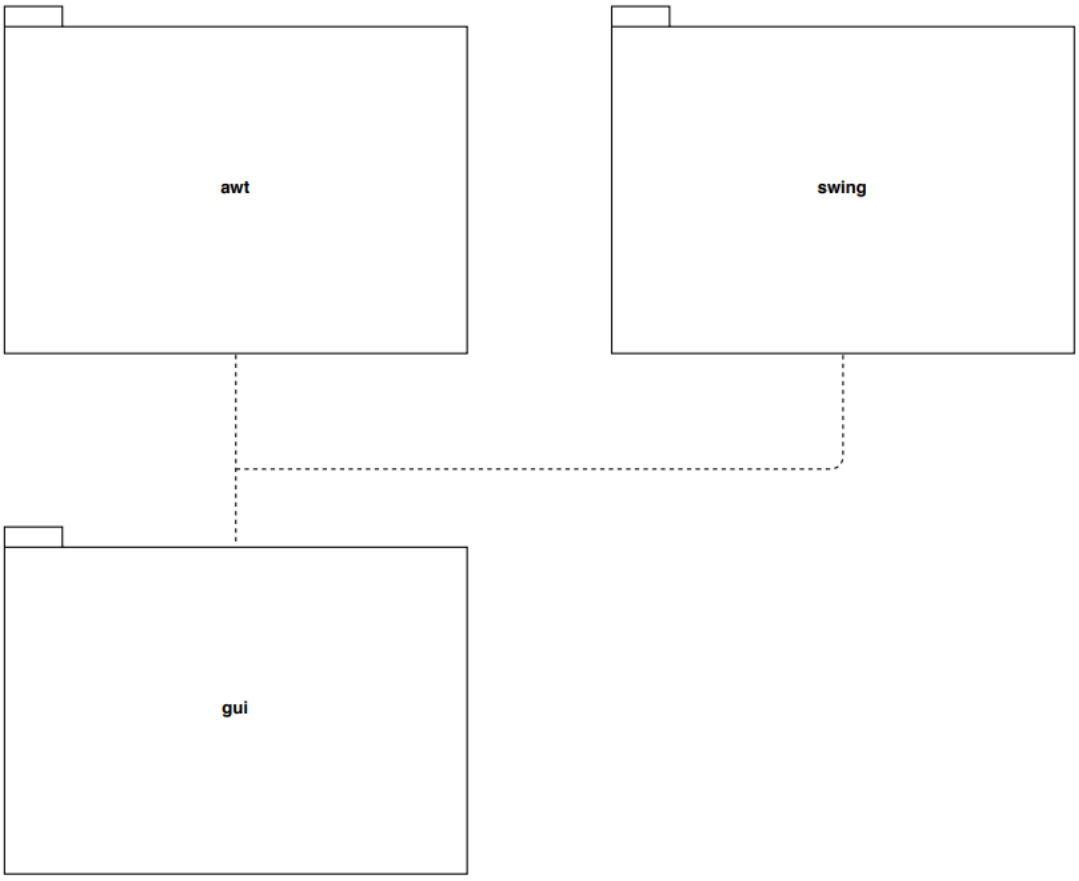
POJECT DEVELOPMENT

Time Log:

Project	Sokoban				Language	Java
Date	**Start**	**Stop**	**Break time**	**Actual time**	**Phase**	**Comment**
28/11/19	7:00 p.m.	9:00 p.m.	0	2 hours	Analysis and Algorithms	It was very hard
29/11/19	7:00 p.m.	9:00 p.m.	0	2 hours	Coding	Made some progress in the gui
06/12/19	4:00 p.m.	9:00 p.m.	0	5 hours	Coding	It was very Confusing, had a lot of trouble
07/12/19	2:00 p.m	7:00 p.m.	0	5 hours	Coding	Made some progressin the movement of the lightball
08/12/19	1:00p.m.	9:00 p.m.	0	8 hours	Coding	Finish the light ball movement
09/12/19	7:00 a.m.	2:00 p.m.		7 hours	Coding	I finished all the details and errors
09/12/19	4:00 p.m.	5:30 p.m.	0	1:30 hours	Documentation	It was a lot of work
					Total	30 hours 30 minutes

Diagrams:

1. Package Diagram

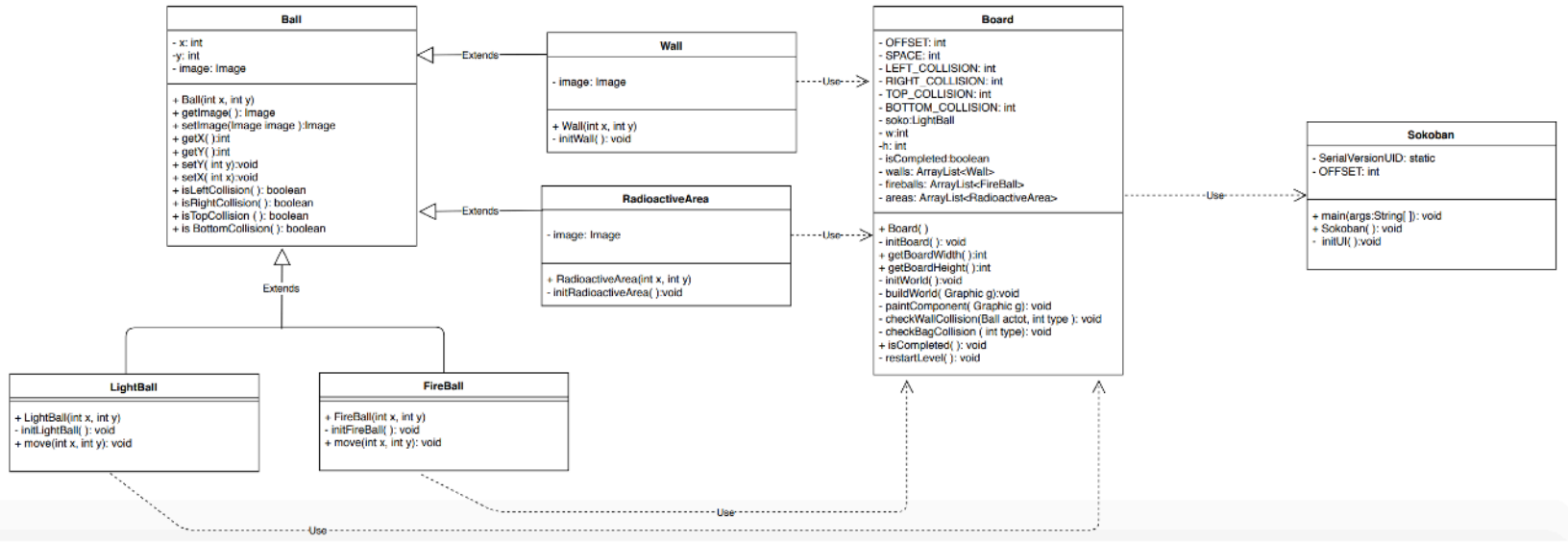


The awt package is the main package of the AWT, (Abstract Windowing Toolkit). It contains classes for graphics, including the Java 2D graphics capabilities, which helps to define the basic graphical user interface (GUI) framework in Java.

The swing package is used to create window-based applications. It is built on the top of AWT, (Abstract Windowing Toolkit), API and entirely written in java. Unlike AWT, Java Swing provides platform-independent and lightweight components.

The gui package is where the frame, walls, balls, etc are created; this elements use the awt and swing packages. The GUI (Graphical User Interface) package, also contains the main.

1. Class Diagrams



There are seven classes in this sokoban program.

In the Wall class is where the method to create the walls is; the method to create the walls receives as parameter the coordinates x and y.

This class also imports an image to use it for the walls and also extends the the ball class to obtain the collisions and locations.

In the RadioactiveArea class is where the method to create the radioactive area is; the method to create the radioactive area receives as parameter the coordinates x and y.

This class also imports an image to use it for the radioactive area and also extends the the ball class to obtain the collisions and locations.

In the LightBall class is where the method to create the light ball is, the properties and the movement of the light ball. This class extends the Ball class to obtain the collisions and locations.

In the FireBall class is where the method to create the fire ball is, the properties and movement of the fire ball; this class extends the Ball class to obtain the collisions and locations.

In the Ball class is where the method to obtain the locations of the balls is and the method to detect the collisions.

In the Board class is where all the interactions of the elements of the sokoban occur. This class is very important, because is basically the logic or where the game takes place.

The Sokoban class is where the main is and from where the program runs.

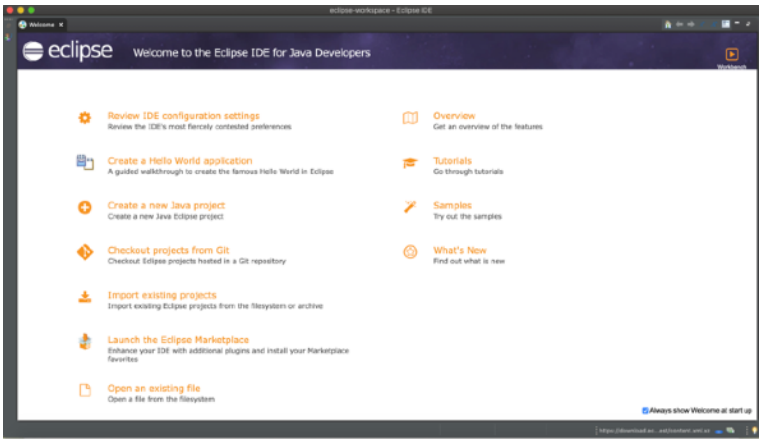
Code:

Attached Files

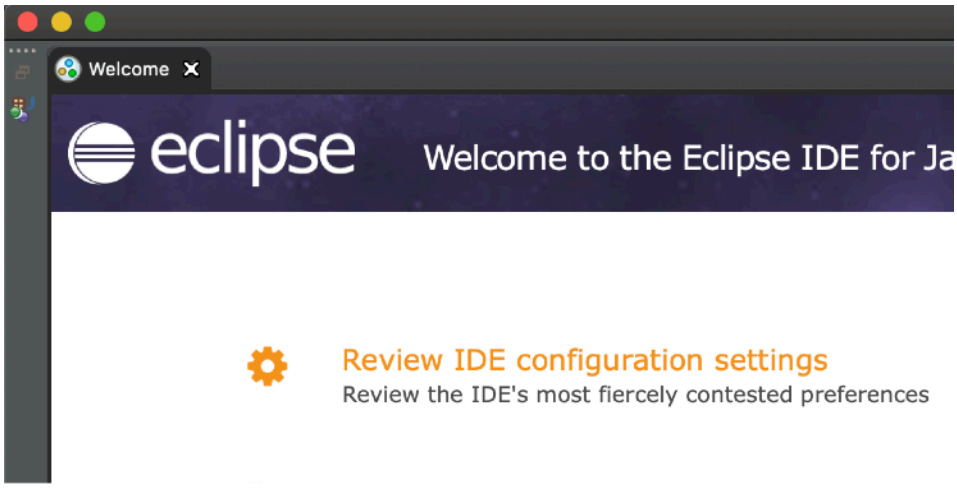
Compilation:

For this particular project, I use eclipse, so in order to run the sokoban program, you need to:

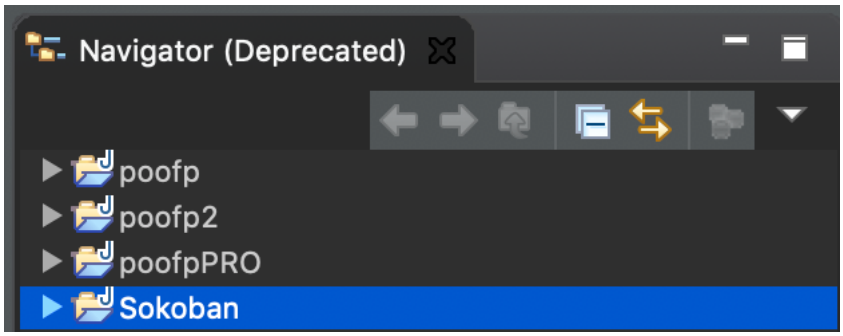
1. Open Eclipse



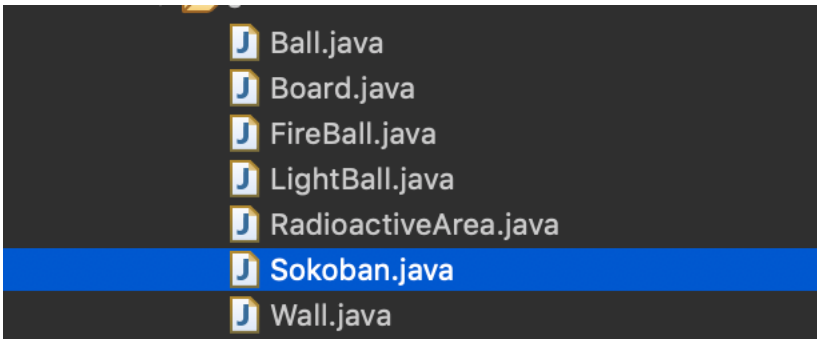
2. Close the welcome page, by clicking on the cross on the left upper corner.



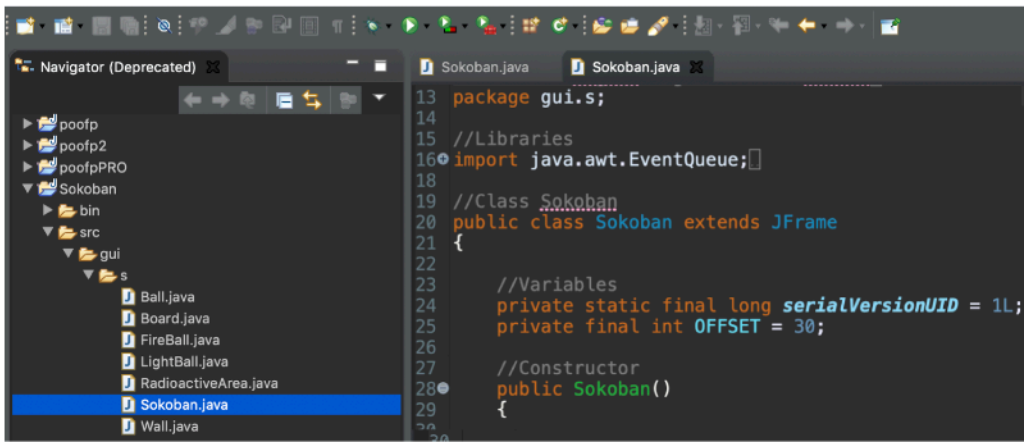
3. Select the project on the left side of the screen, in this case the name is “Sokoban”



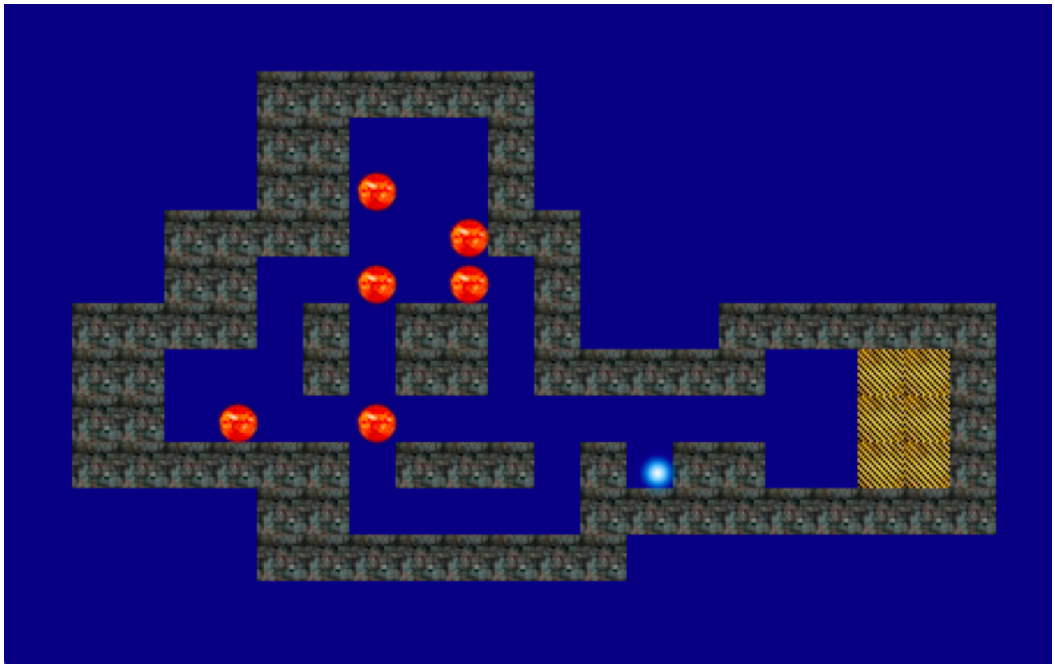
4. Then you need to go to the Sokoban class, also on the left side of the screen.



5. Then you need to press the biggest green button with a white arrow on it, on the upper part of the screen.



6. The program is open, now is time to play!



Solution of the Sokoban