



Programming II

Project (3)

FRUIT NINJA

Designed By:

- | | |
|--------------------|----------|
| 1. Nourhan Waleed | ID: 6609 |
| 2. Mariette Magdi | ID: 6147 |
| 3. Theodora George | ID: 6628 |
| 4. Merna Mohammad | ID: 6369 |

Project Description & Overview:

Fruit Ninja is a smash-hit Arcade-type video game developed by Halfbrick Studios Ltd.

This project is an implementation of the successful game made using object-oriented programming (OOP) concepts and SOLID design principles through Java programming language.

The main purpose of the game is to achieve high scores by earning points through slicing and slashing different types of fruit as they fly across the screen. This is implemented by utilizing multiple GUI elements (via JavaFX) to showcase the different game objects (fruit, bombs) and help the user interact with the game environment effectively.

This project was made using the MVC design pattern, with the classes distributed by function into three packages:

- package "Model" for handling of the game's behaviors and calculations made during gameplay (score calculation, game difficulty settings, behavior of the different types of fruit and their effects on gameplay).*
- package "View" for the design and display of a seamless, user-friendly interface that can Make gameplay engaging (Colorful backgrounds, the images that depict the fruit/bombs in multiple states and so on)*
- package "Controller" to tie together the various elements of the GUI in the "View" package with the structural code and logic of the game in the "Model" package.*

The design patterns used in this project are:

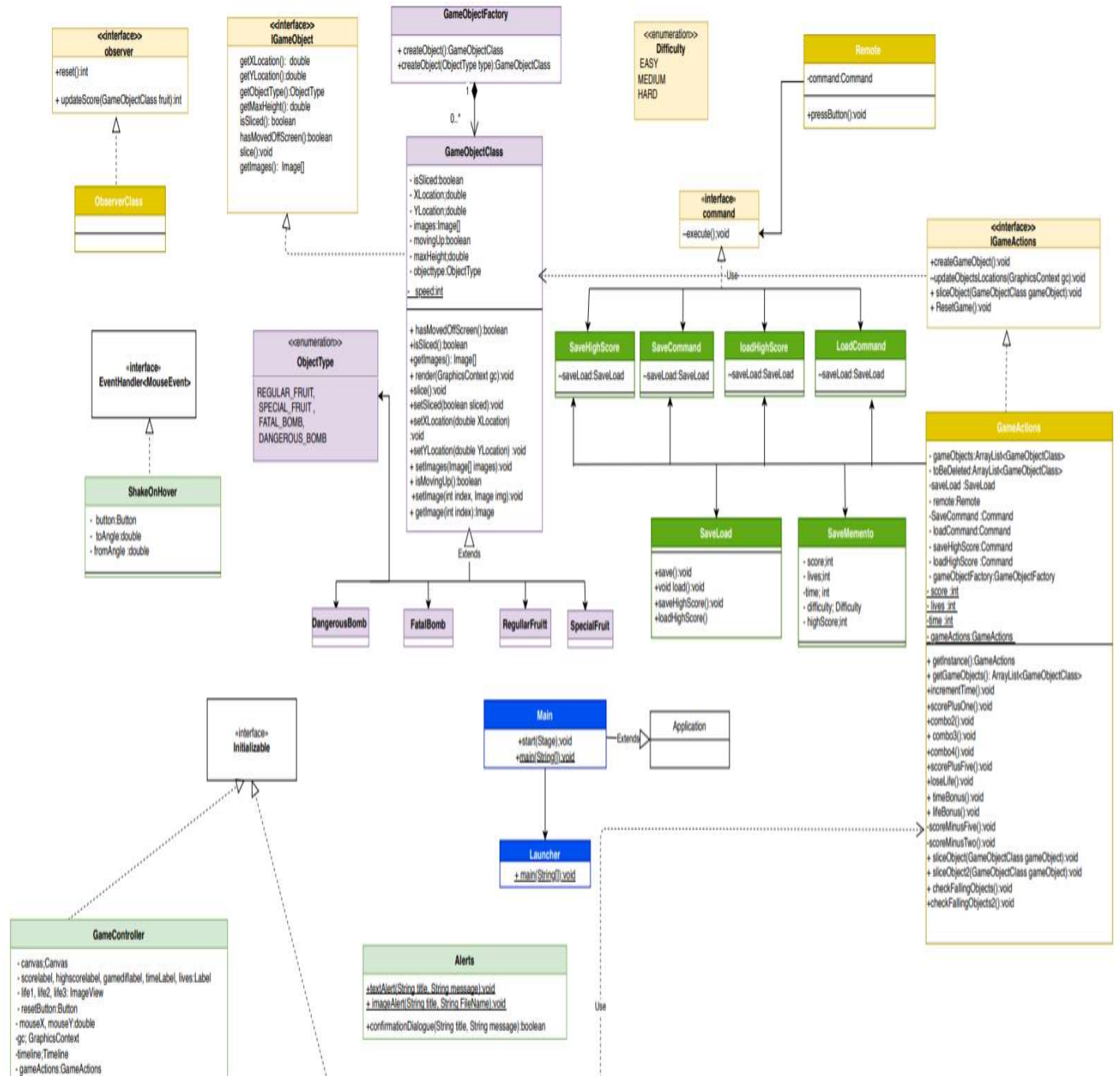
1. Creational:

- Singleton DP:**
Used to create only one instance of the game.
- Factory DP:**
Used to create multiple objects (fruit, bombs etc.) in-game, each object with certain properties, in a random manner.

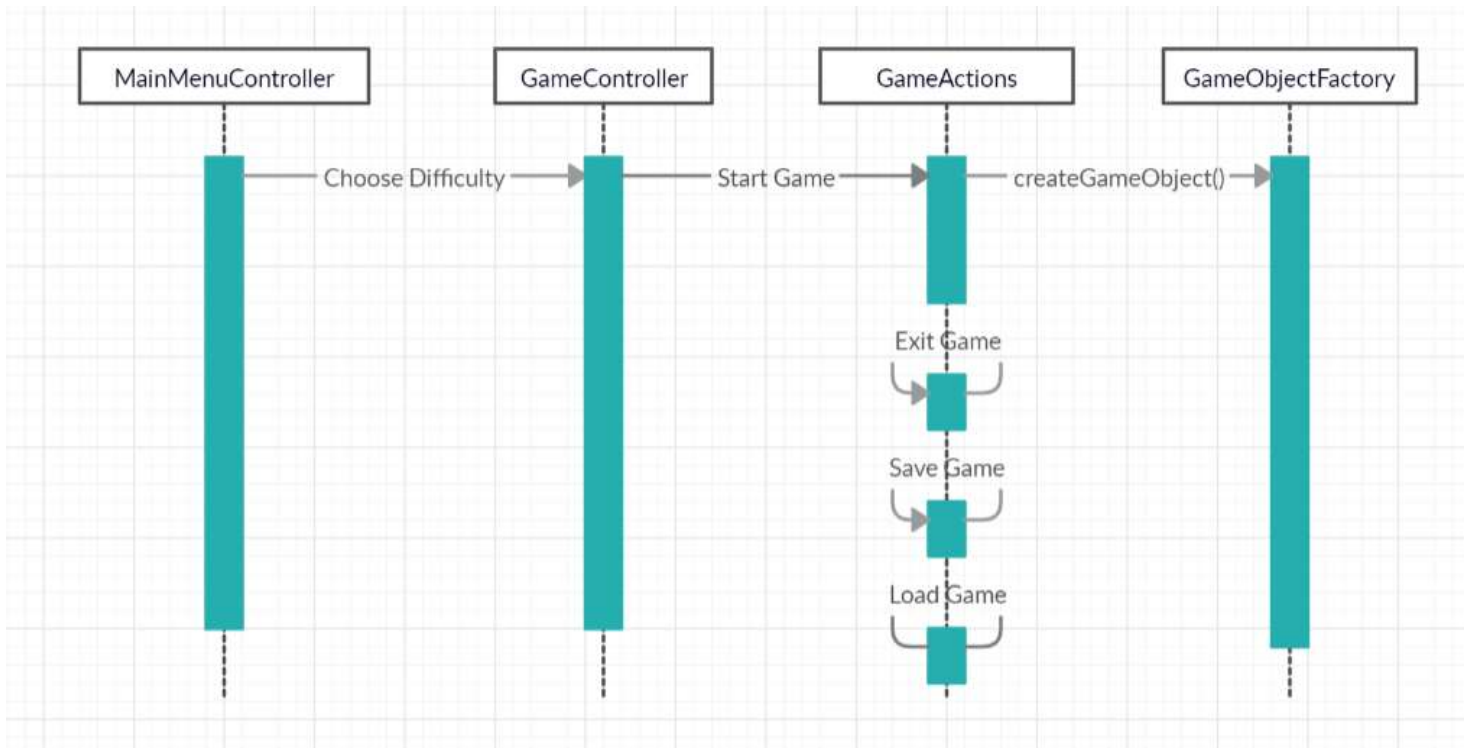
2. Behavioral:

- Command DP:
Used to reset information (such as high score, score etc.) into the initial state in the game.
- Memento DP:
Used to save and load information (such as high score, score, lives etc.) from and to the game.
- State DP:
Used to alter the actions and effects of each in-game object based on the type of the object (Regular fruit, Special fruit, Bombs etc.)

Class Diagram of the project:



Sequence Diagram for the project:



User's Guide for the Game:

HOW TO PLAY FRUIT NINJA

The primary control input in this game application is the mouse. The user can use the mouse to navigate the game's main menu and play through the game's levels.

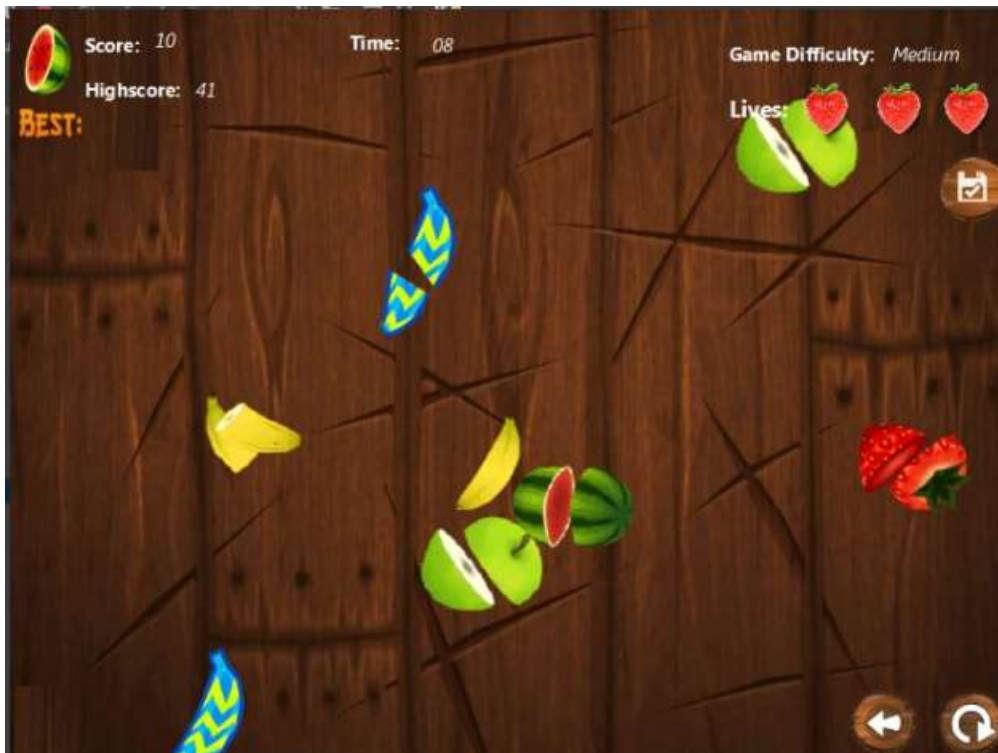
- Upon opening the game, you will be greeted by the main menu:



From this menu, you can start a new game by either clicking the desired difficulty level ("Easy", "Medium", "Hard") or by clicking "Random" for random game difficulty, or load a previous game by clicking "Load Game".

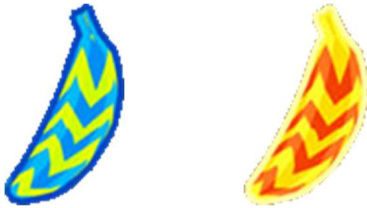
You can also play in Arcade mode by clicking on the "Arcade" button.

- After choosing one of these options, the game will begin!
 - ✚ Drag your mouse across the fruit flying on the screen to slash it.
Try to slash multiple fruit at once for a combo!



- ✚ Avoid the bombs that can appear amongst the fruit, as they can drop your score and make you lose lives!
There are two types of bombs to watch out for: Dangerous bombs, and Fatal bombs. Dangerous bombs can make you lose a life, while Fatal bombs can end your game!

- While playing the game, Special fruit may appear on-screen. This fruit will reward you 5 points when sliced, and might restore one of your lives! Special fruit will look like this:



- You will start the game with 3 lives 🍓. If all of your lives are lost, the game will be over!



- To exit the application, click on the “Exit” button in the main menu. Have fun!