

# Principles of Object Oriented Programming –

## Assignment 4 Bonus Implementation

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### Description:

#### High Scores Table implementation

The high scores table will store in an external file the last TOP 10 players ordered by their score.

The table will present the user with the high score setter, the score he managed to set and the amount of fruits collected from each kind during the score setters game.

A user who ended the game from the following reasons:

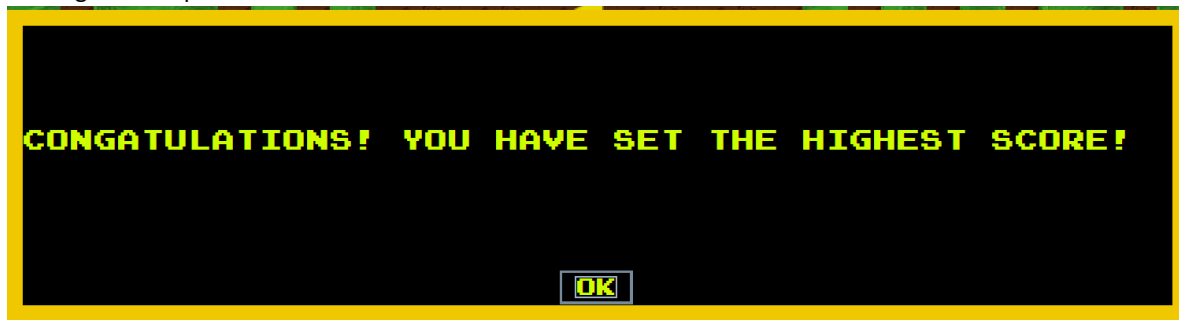
- Won all 4 levels including the Bonus level.
- Lost all 3 lives and lost the game.
- Quit the game willingly by pressing Exit Game button on the controls menu.
- Quit the game willingly by pressing Main Menu button on the controls menu.

Will be presented with the following game dialog:



A player will be able to insert his name (Limited by 18 characters and does not accept an empty string).

If **pressed OK** the players score will be checked, If the player managed to set Highest score A proper message will be presented to him:



In any case if the player surpassed one of the previous high scores (10 in count) he will enter the high scores table and will be able to see his name in the high score menu that can be accessed from the game main menu.

If the player did not manage to set a high score, his input will be ignored.

If **pressed CANCEL** the players score will not be checked for high score.

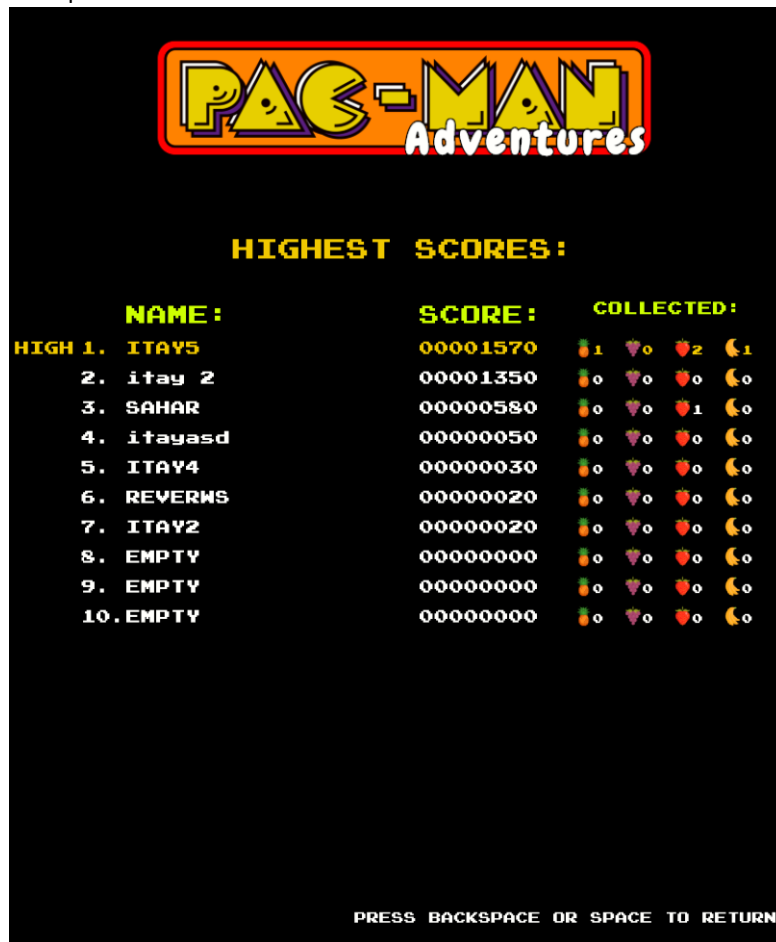
The high scores file will be saved outside the .jar file and will be a data file named: **HighScores.dat**

If the game is activated from the IDE the file will be saved outside the src folder in the project.

We use a .dat file so that the scores saved can not be altered as in an ordinary .txt file.

If the file does not exist during initial use, it will be created automatically.



The High Scores table can be presented from the main menu by choosing HIGH SCORES option.  
Example:



### Additional Ghost Entities

We implemented 3 new ghost entities that are spread in the different level in order to diverse each level experience and to increase the level of difficulty as the player passes levels.

The details about each ghosts powers is as follows:



Ghost name	Ghost property	Sprite	Weapon	Weapon sprite	Weapon property
Commando Ghost	Slow, Trapper		Spike Traps		Immobile, Blocks paths.

Level Appearance: Level 4

The Commando ghost lays Spike Traps from the moment he is armed in a frequency determined by the game difficulty. After a certain time, also determined by the game difficulty, the traps dispose and open the path for Pacman.

Every 8 traps the commando ghost lays he “accidently” drops a TNT bomb that can destroy all of the traps at once by exploding them.



Ghost name	Ghost property	Sprite	Weapon	Weapon sprite	Weapon property
Green Ghost	Fast, Poisons		Poison Gas		Encounter effect, kills slowly, Decreases game points

Level Appearance: Level 2

The Green Ghost can Poison Pacman Character.


If Pacman gets hit by the green ghost, he will immediately become poisoned and a timer of 20 seconds will appear above his head with the following sign: 


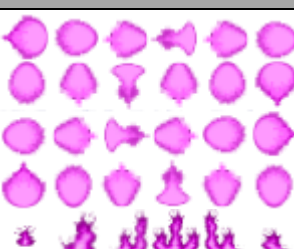
Each second passes from the poison counter the game score will decrease in 5 points.

If the timer ends – Pacman dies.

Once poisoned An Elixir will randomly appear on the game board to save Pacman, If Pacman manages to get to it before the timer gets down to 0, Pacman will be cured and the poison effect will pass.


Elixir sprite : 

Pacman poisoned effect sprite: 

Ghost name	Ghost property	Sprite	Weapon	Weapon sprite	Weapon property
Purple Ghost	Slow, Changes game controls		Spell		Very fast, Inverts players control by hit. (LEFT IS RIGHT) (UP IS DOWN)

Level Appearance: Level 3

The Purple Ghost can cast a spell on Pacman which makes Pacman dizzy for 5 seconds.

The following sprite will appear above Pacman's head : 

While Pacman is dizzy all of the player's movement controls are inverted (Left is Right, Up is Down and opposite).

### Game Play Additions

We added 4 additional properties to the game that were not originally requested in the assignment:

Portals: Each maze has fixed positions that are defined as "Portals".

Portals can teleport Pacman from one portal to the other if The Pacman character enters them (Encounters them). Portals can help Pacman escape the ghosts chasing, but they also have a downside.

Once entered a portal, Pacman will exit from another portal on the maze board without knowing in which one he will exit!

Portals are constant in the game map and can aid the player to win if used properly in the right situations.

Portal sprite: 


Summoner and Minion: Every 35 seconds (In easy difficulty, increases as game difficulty increases), A Summoner will randomly generate on the maze board for 8 seconds before it is automatically dispose if not collected. A Summoner is a magic hat that Summons a Minion to aid Pacman in his battle against the ghosts. Summoner sprite:





If the summoner is collected a Minion will spawn at Pacman's location to aid Pacman killing the ghosts. The Minion is The Fastest Character in the game and he chases the ghosts randomly and kills them to aid Pacman gain time to collect coin or to escape the ghosts in difficult situations. If the Minion kills all ghosts on the board, and they are all dead simultaneously, The Minion has done its job and he will dispose automatically. Anyway, the Minions disposes after 12 seconds from appearing. Minion sprite:



#### Enhanced Energy Pills:

As in the original game if Pacman eats one of the energy pills:  (That now regenerates in the maze corners in a time depended by the game difficulty) located in the maze board corners he will gain

his sword:  and all of the ghosts will become vulnerable. For 8 seconds Pacman

will be able to eat the ghosts, during those 8 seconds all of the ghosts sprites will change to the following sprite: 

If Pacman manages to eat a ghost, the ghost will change its sprite again and will run back to it's original spawn to regenerate, gaining Pacman time to collect more coins.

After a ghost is dead until it is respawned the sprite will change to:

(Dancing eyes as inspired by the original game).



#### Game Difficulty:

As mentioned extensively before,

In the main game menu, before the game starts a player can choose one of 5 different options for game difficulty. The difficulty chosen effects many aspects of the game play.

As the difficulty goes up, Things that are meant to help Pacman will take longer time to generate, ghosts will be more aggressive and change their state from chase to random less frequently and from a larger distance from Pacman, ghosts shooting delays will shorten and a few more effects that can be noticed during game-play.