ELECTRONIC, ELECTRICAL AND SYSTEMS ENGINEERING

MSc Coursework
Software and Systems

2020-2021

Python Programming: Computer Game (GUI) with dice simulator

Python Programming

1. Aims and Objectives

This Python assignment is about implementing a graphical user interface to create a S*nakes and Ladders Game*, the board for which is shown below:

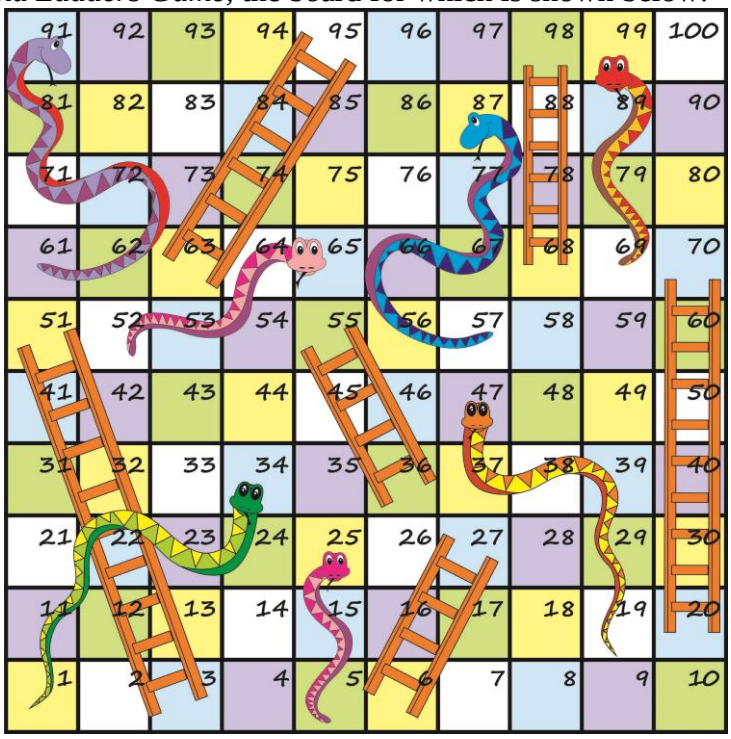

Figure 1: Snakes and Ladders Board

Image courtesy: https://i.pinimg.com/originals/02/6e/9d/026e9d080dcfa13c158f043e874002e7.jpg

As part of the coursework, this game can be played between 1- 4 players. As a single player game, the player will play against the computer. You will also be required to program a dice rolling simulator which will run each time a player has their go.

Rules of Snakes and Ladders

1. Every player has a different coloured counter.
2. At the start of the game all the counters are on square 0 (off the board).
3. Each player takes turns in rolling a dice.
4. The player's counter advances the number of squares shown on the dice.
5. If the counter finishes on the bottom of a ladder it moves to the top of the ladder.
6. If the counter finishes on the top of a snake it moves to the bottom of the snake.
7. If a player reaches square 100 they win.
8. If the current position plus the dice number exceeds 100, they don't move (e.g. on square 98 – rolls a six – player doesn't move).

2. Lab Work

Using the **object oriented approach**, implement the *Snakes and Ladders Game with its own Dice rolling simulator* as a Python application. The application should be able to create a GUI containing all widgets required to run the game smoothly. The application should at the least have the following:

1. *It should let the user choose the number of players playing (between 1 and 4).*
2. *It should allow the Player to enter their name.*
3. *The application alerts all players that the game is starting, and that all counters should be placed on square 0 (off the board and invisible).*
4. *The application alerts everyone that it is 'PlayerName's' turn. Nothing happens until 'PlayerName' presses the 'roll dice' button. The roll dice simulator generates the dice throw.*
5. *The application informs all of the players of the dice value and updated counter positions (taking into account all of the snakes and ladders).*
6. *This is repeated for all of the players until someone wins (gets to square 100).*
7. *It displays the winners name and asks the user to quit or play another game.*

After creating your GUI with all the above widgets, you will then have to bind these to the functions to get your application working. Handle any exceptions that may arise during its use.

3. Assessment

This coursework contributes 30% of the total mark for Software and Systems module. You are expected to submit your Python program along with a 2-minute video of your GUI when the game being played. The Python code (.py file) and the video must be submitted via canvas as two separate files (Click on the + Add Another File link to add another 'Choose File' button while submitting your assignment) by **14:00** on **Monday, 7th December 2020.**

Marks distribution will be as follows:

a) Game Functionality:
   i. Rolling dice simulator (20%)
   ii. Game play (30%)

b) GUI design. (30%)

c) Well documented code. (15%)

d) Extra added functionality of your choice – mention that in your comments. (5%)

Note: There is a penalty of 20% marks if you do not use object oriented approach.

A word of caution 

"Plagiarism will not be tolerated. It is the act of a Student claiming as their own, intentionally or by omission, work which was not done by that Student. Plagiarism also includes a Student deliberately claiming to have done work submitted by the Student for assessment which was never undertaken by that Student, including self-plagiarism and the other breaches. Sanctions of a plagiarism include the Student failing the Programme of study".