Galgotias College of Engineering & Technology

Session 2019-20

MINI PROJECT/INTERNSHIP

TOPIC :- SNAKE GAME

BACHELOR OF ENGINEERING AND TECHNOLOGY
(DEPARTMENT OF INFORMATION AND TECHNOLOGY)

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3RD SEMESTER
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History of the Game

- “Snake It Up” is a game where the body of snake grows in length as soon as he eats his food.

- It was first published by Nokia , for monochrome phones. It was programmed in 1997 by T. Armanto of Nokia and was introduced on the Nokia 6110.

Development

- The language used in programming this game is Python 3.7 .
- The Python libraries used are:
    - Pygame
    - Random

Pygame : Pygame is a cross-platform set of Python modules designed for writing video games. It includes computer graphics and sound libraries designed to be used with the Python programming language.

Random : This module implements pseudo-random number generators for various distributions.

Major Tasks

- Making of the Canvas
- Making of the Snake
- Movements of the Snake
- Food Generation
- Conditions for termination of the Game.

Canvas

- For making the Canvas we first have to set appropriate screen width and height.
- Then use the method `pygame.display.set_mode((screen_width,screen_height))` and assign this object to a variable gameWindow.
- After making of the window, add the caption which will be displayed on the topmost bar.
- Also,we have to update the window regularly on the screen using the function `pygame.display.update()`, defined in the gameloop.

Making of the Snake

- The Snake is made using “Lists” in Python.
- First initialize the x,y coordinates of the initial position of just the head of the snake and also the size of the snake.
- Then use the function `pygame.draw.rect(gameWindow,color,[snake_x,snake_y,snake_size,snake_size])`. This method will create a rectangle on the screen at the given (snake_x,snake_y)coordinates of the size in the variable snake_size.

Movement of the Snake

- This method is defined the gameloop. We first need to declare the velocity of the snake on the screen, according to the conventions:
  - Positive for positive x direction(right keyboard key) and negative y direction(down keyboard key).
  - Negative for negative x direction(left keyboard key)and positive y direction.

(their is an initial velocity taken for every direction on the screen.)

- Create a list in which the coordinates on which the snake has to be created are stored and update the list at every movement on the screen.

- Update the length of the list as soon as the snake eats it’s food. It checks whether the length of the snake is under control.
- If at any condition the length of the snake exceeds the updated snake length,delete the last rectangle from the snake’s body.
- The movement is restricted to just four directions :
    - Left
    - Right
    - Up
    - Down

(we just are using here the keys four key of the Computer keyboard as the main input).

- So we assign each direction key on the keyboard their respective directions and accordingly set the velocity direction.

The Food

- The food is generated using the Random library of python.
- The same drawing pygame function is used to create a red color rectangle on the screen of a given dimensions on the screen,denoting the food.
- The coordinates of the Food are generated through the `random.Randint()`method of Random library.
- The snake is made to eat the food by calculating the absolute values of the distance between the coordinates of the Snake's head and of the food.

GameOver

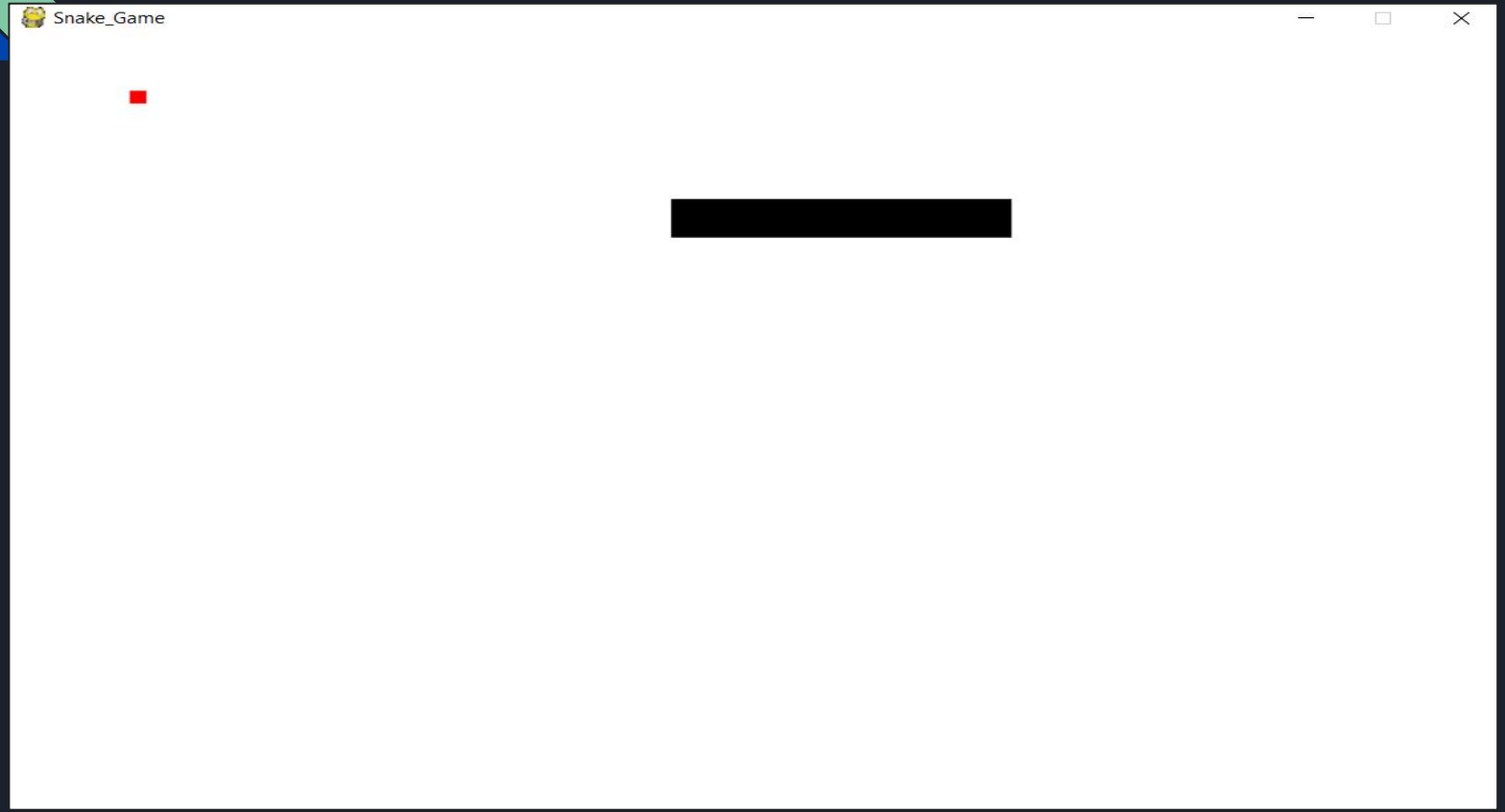
- The game is made to terminate under two conditions:
  - If the snake accidently hits the wall of the canvas.
  - If the snake accidently overlaps itself.

Implementation

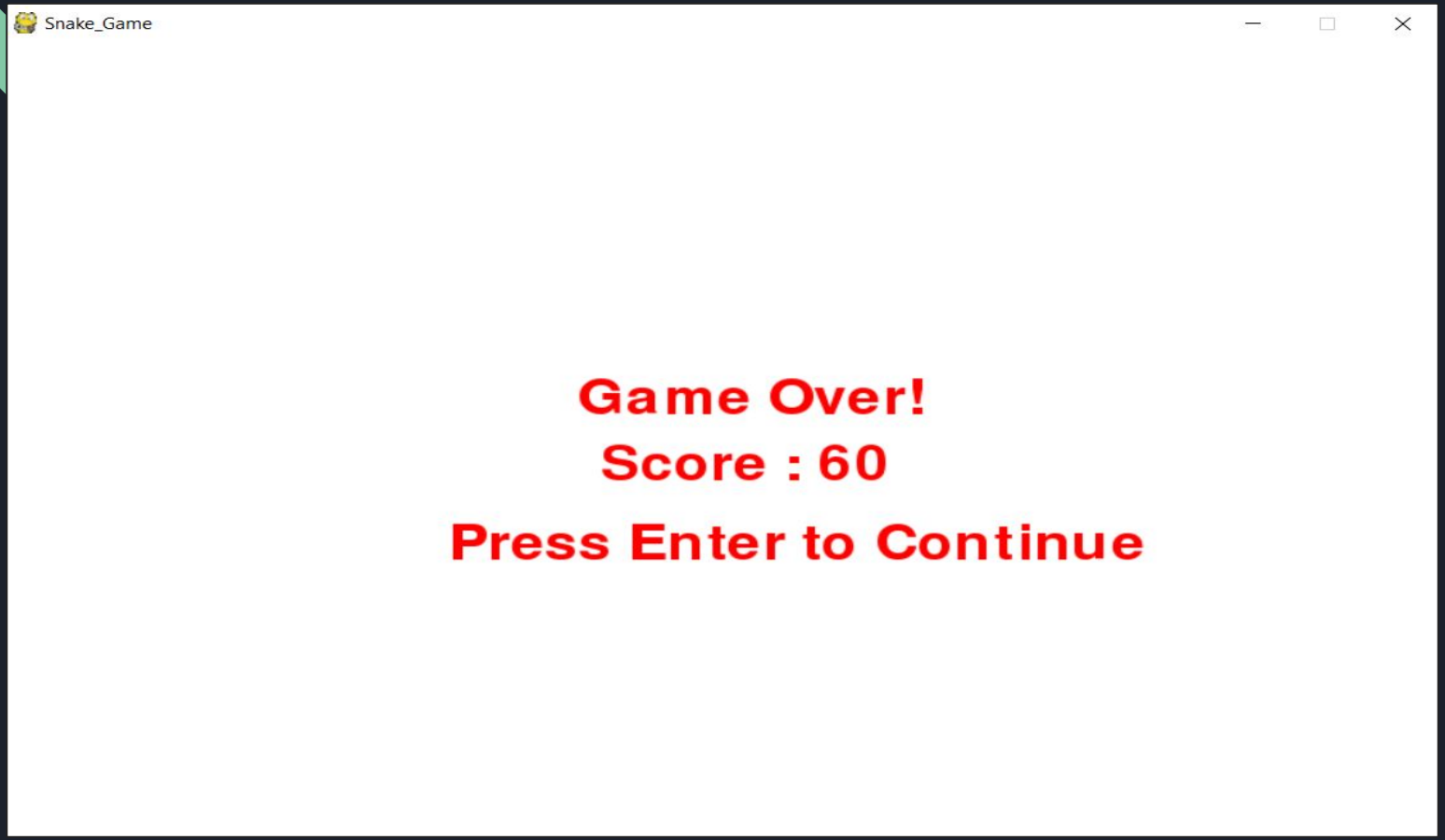
- **Accidently hitting the wall** : This can be easily checked using the condition the if any of the coordinates of the snake and the wall becomes equal then “Gameover”.
- **Accidently overlapping itself** : This can be implemented that if any two coordinates set of the snake becomes equal then it overlaps and the game ends

STARTING WINDOW

SNAKE GROWS



GAMEOVER WINDOW



THANK YOU