EENG5780 Systems Programming

Homework assignment – 3: GUI using PYTHON Tkinter

Aim:

The aim for this homework assignment is to create an individual program using skills gained during the introduction to GUI in Python. I wanted to add additional functionality through individual research.

Introduction:

I wanted to create a program that could showcase the learnings from the lectures and workshops, also create a relatable program that is well known. I did some research using Python crash course, Python for dummies books and online research to create Snakes game. The motivation for this game assignment was to create something unique and yet something almost everyone has experience of.
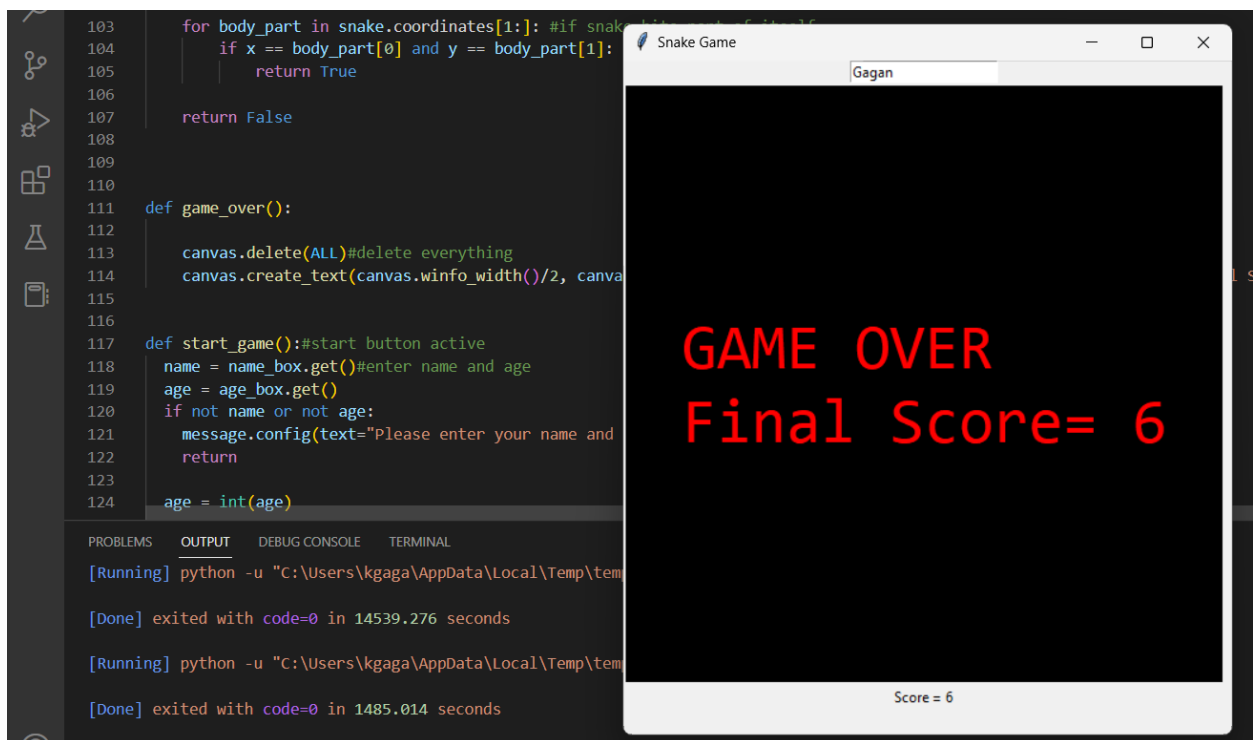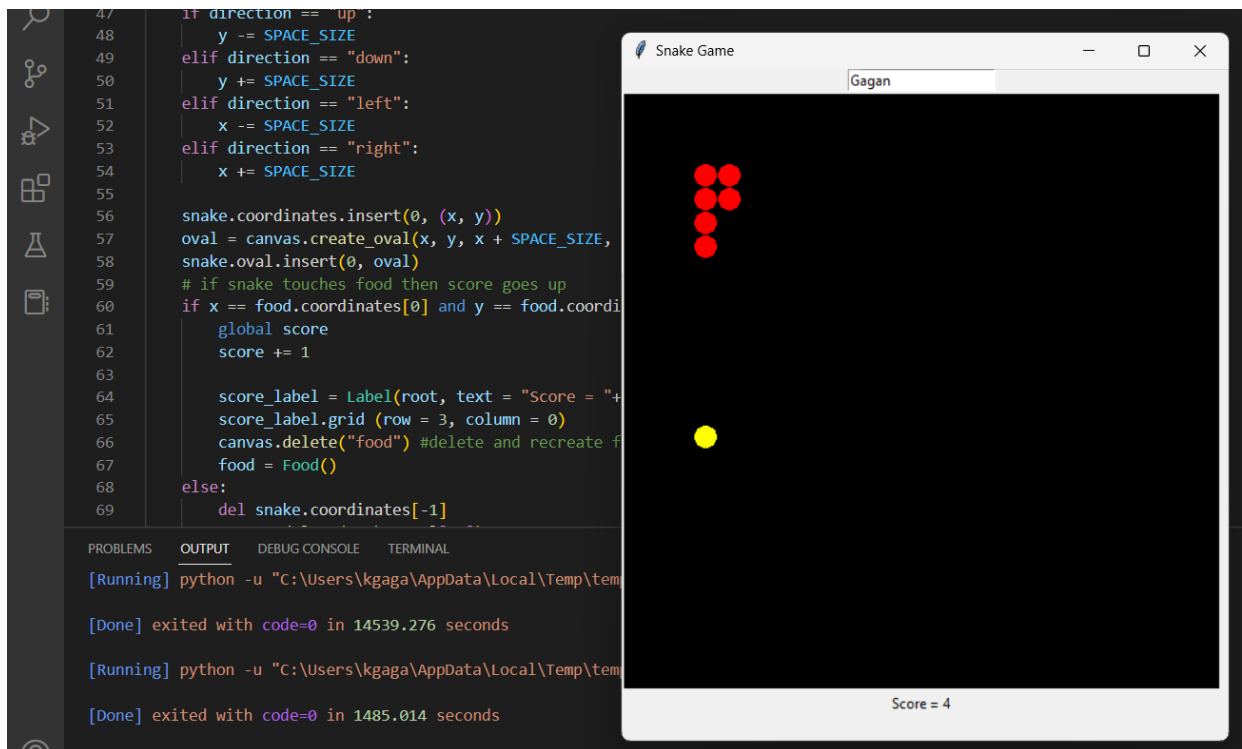
Program:

The program includes 3 main pages. Start screen is used to input data like name, age and difficulty level. This stage was kept fairly simple using labels, text box, radio buttons and normal button. I also used grid approach to set it up on the page. Name and age input are mandatory to begin the game and there is an age limit of 18 year to begin the game using start button.
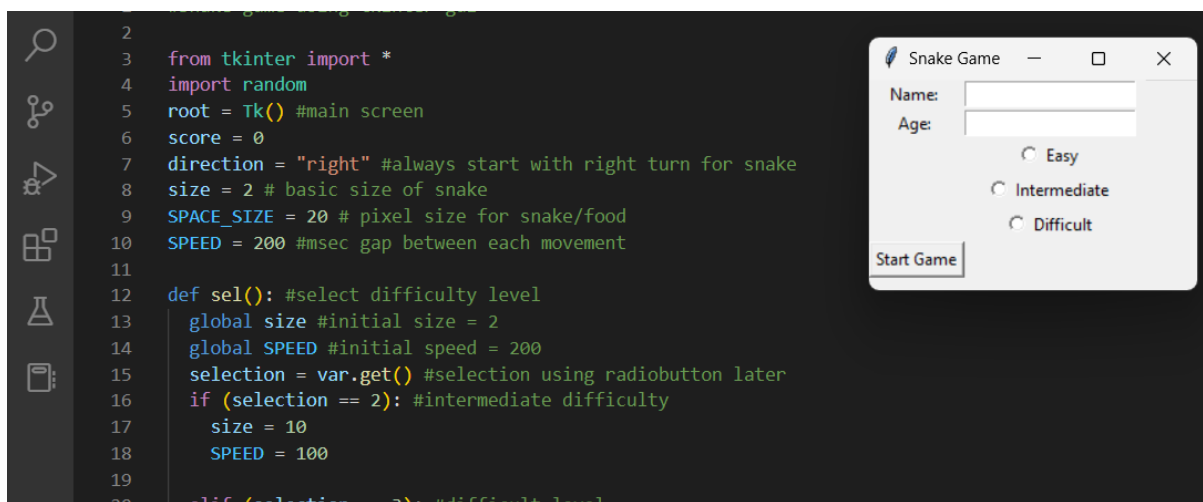
The difficulty level controls the size of the snake and the speed at which it will travel. Warning labels appear if the name/age criteria is not met. Game starts with the start button.

When the game starts, food appears at a random location while snake appears at top left corner using co-ordinates system. The canvas is created with 500 width and 500 height with black background. Snake direction is controlled using bind function and can be controlled by keypad and if snakes contacts the food, the food is regenerated at another random location and the score increases. If the snake goes beyond the canvas limit or touches its body, the game ends.

In case of snake's death, the canvas is destroyed and Game over message is displayed with Final score.

```
47      if direction == "up":
48          y -= SPACE_SIZE
49      elif direction == "down":
50          y += SPACE_SIZE
51      elif direction == "left":
52          x -= SPACE_SIZE
53      elif direction == "right":
54          x += SPACE_SIZE
55
56      snake.coordinates.insert(0, (x, y))
57      oval = canvas.create_oval(x, y, x + SPACE_SIZE,
58      snake.oval.insert(0, oval)
59      # if snake touches food then score goes up
60      if x == food.coordinates[0] and y == food.coordi
61          global score
62          score += 1
63
64          score_label = Label(root, text = "Score = "+
65          score_label.grid (row = 3, column = 0)
66          canvas.delete("food") #delete and recreate f
67          food = Food()
68      else:
69          del snake.coordinates[-1]
```

PROBLEMS   **OUTPUT**   DEBUG CONSOLE   TERMINAL

[Running] python -u "C:\Users\kgaga\AppData\Local\Temp\tem

[Done] exited with code=0 in 14539.276 seconds

[Running] python -u "C:\Users\kgaga\AppData\Local\Temp\tem

[Done] exited with code=0 in 1485.014 seconds

```
103        for body_part in snake.coordinates[1:]: #if snak
104            if x == body_part[0] and y == body_part[1]:
105                return True
106
107        return False
108
109
110
111    def game_over():
112
113        canvas.delete(ALL)#delete everything
114        canvas.create_text(canvas.winfo_width()/2, canva
115
116
117    def start_game():#start button active
118        name = name_box.get()#enter name and age
119        age = age_box.get()
120        if not name or not age:
121            message.config(text="Please enter your name and
122            return
123
124        age = int(age)
```

PROBLEMS   **OUTPUT**   DEBUG CONSOLE   TERMINAL

[Running] python -u "C:\Users\kgaga\AppData\Local\Temp\tem

[Done] exited with code=0 in 14539.276 seconds

[Running] python -u "C:\Users\kgaga\AppData\Local\Temp\tem

[Done] exited with code=0 in 1485.014 seconds

Conclusion:

I found GUI to be a powerful tool. Python is a powerful coding language compared to C++ or C# for GUI. I learnt various functionalities which helped me complete all the objectives I set out. I believe game could be improved further. Multiple games and other graphical interfaces can be created easily using python.