ARTIFICIAL INTELLIGENCE ASSIGNMENT

Project : Simple AI Game

Section: K18GA

Made by : Group 2

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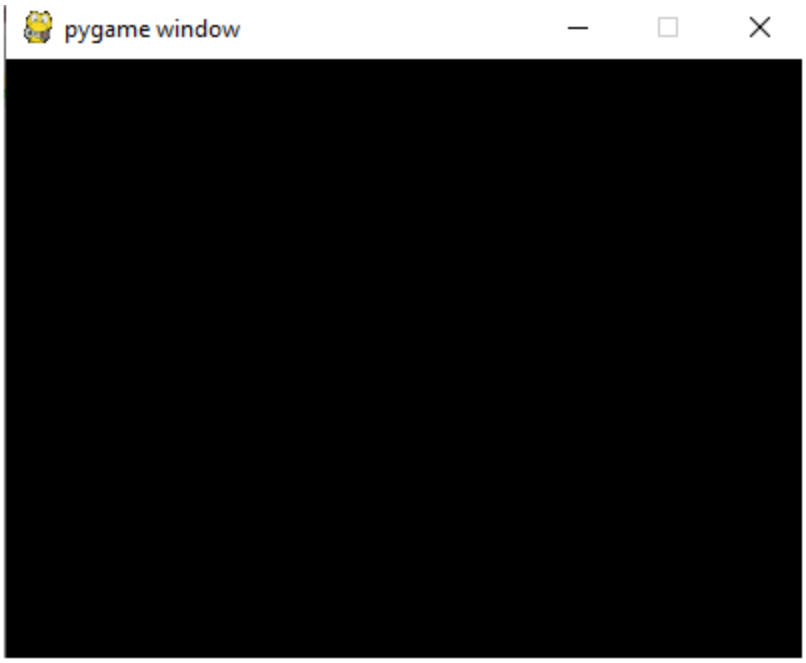
Create the Screen:

To create the screen using Pygame, we need to make use of the display.set_mode() function. Also, we will have to make use of the init() and the quit() methods to initialize and uninitialize everything at the start and the end of the code. The update() method is used to update any changes made to the screen. There is another method i.e flip() that works similarly to the update() function. The difference is that the update() method updates only the changes that are made (however, if no parameters are passed, updates the complete screen) but the flip() method redoes the complete screen again.

CODE :

```
Import pygame

pygame.init()

dis=pygame.display.set_mode((400,300))

pygame.display.update()

pygame.quit()

quit()
```

OUTPUT :



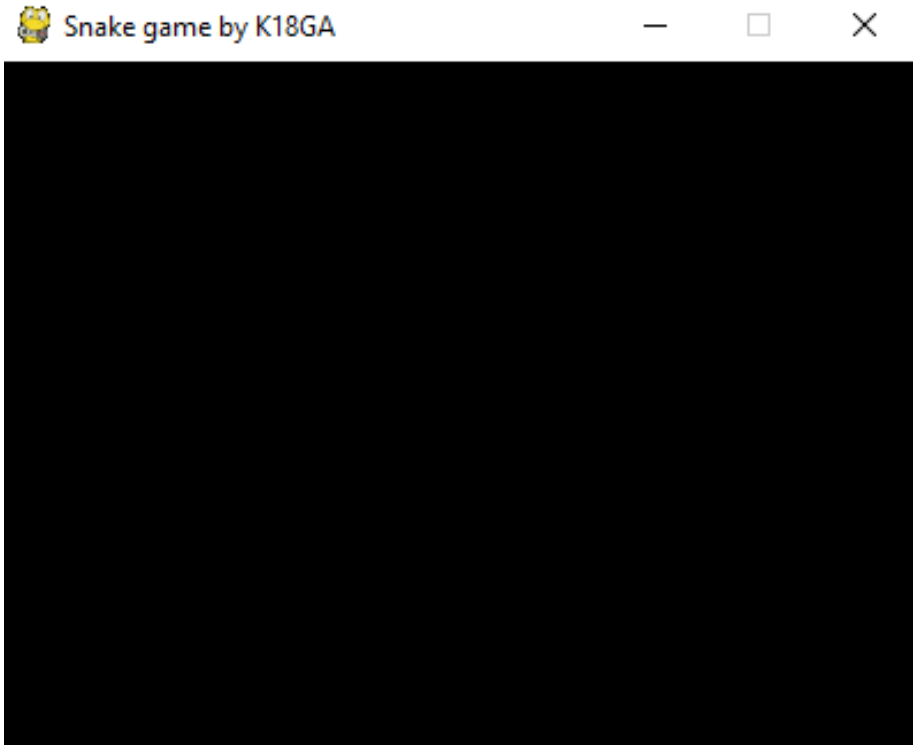
But when we run this code, the screen will appear, but it will immediately close as well. To fix that, you should make use of a game loop using the while loop before I actually quit the game as follows:

CODE :

```
import pygame

pygame.init()

dis=pygame.display.set_mode((400,300))

pygame.display.update()

pygame.display.set_caption('Snake game by Edureka')

game_over=False

while not game_over:

    for event in pygame.event.get():

        print(event)

 pygame.quit()

quit()
```

When we run this code, we will see that the screen that we saw earlier does not quit and also, it returns all the actions that take place over it. We have done that using the event.get() function. Also, we have named the screen as “Snake Game by Edureka” using
the display.set_caption() function.

OUTPUT :



Now, we have a screen to play your Snake Game, but when we try to click on the close button, the screen does not close. This is because we have not specified that your screen should exit when you hit that close button. To do that, Pygame provides an event called “QUIT” and it should be used as follows:

CODE :

```
import pygame
pygame.init()
dis=pygame.display.set_mode((400,300))
pygame.display.update()
pygame.display.set_caption('Snake game by Edureka')
game_over=False
while not game_over:
    for event in pygame.event.get():
        if event.type==pygame.QUIT:
            game_over=True
 pygame.quit()
quit()
```

Create the Snake:

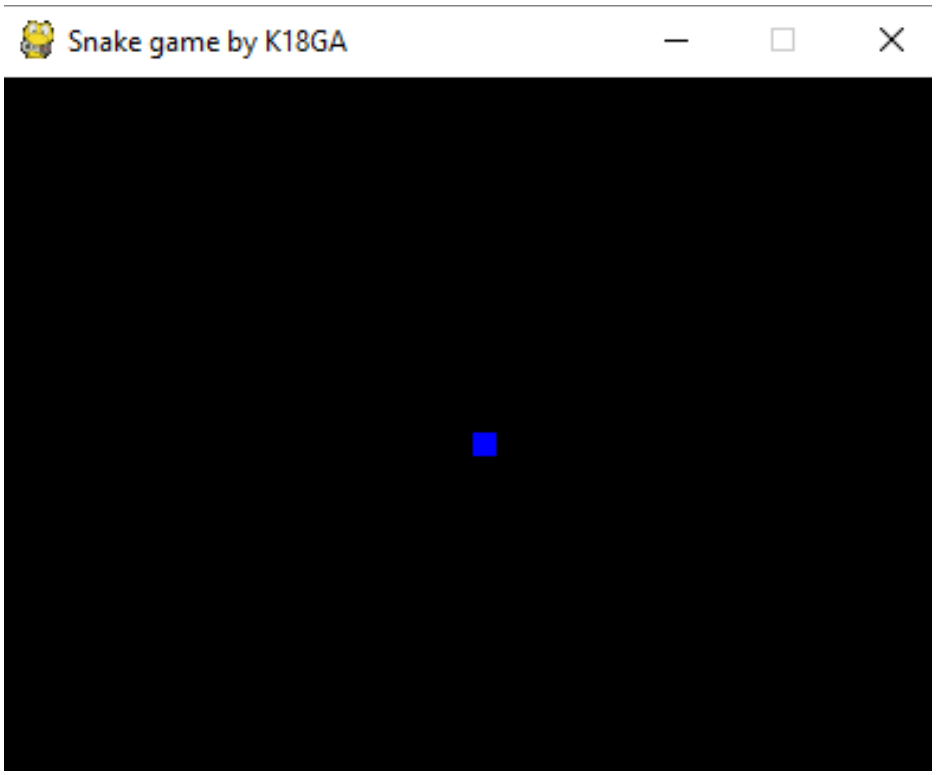
To create the snake, we will first initialize a few color variables in order to color the snake, food, screen, etc. The color scheme used in Pygame is RGB i.e “Red Green Blue”. In case we set all these to 0’s, the color will be black and all 255’s will be white. So our snake will actually be a rectangle. To draw rectangles in Pygame, we can make use of a function called draw.rect() which will help to draw the rectangle with the desired color and size.

CODE :

```
import pygame

pygame.init()

dis=pygame.display.set_mode((400,300))

pygame.display.set_caption('Snake game by Edureka')

blue=(0,0,255)

red=(255,0,0)

game_over=False

while not game_over:

    for event in pygame.event.get():

        if event.type==pygame.QUIT:

            game_over=True

    pygame.draw.rect(dis,blue,[200,150,10,10])
```

```
    pygame.display.update()

pygame.quit()
```

OUTPUT :



Moving the Snake :

To move the snake, we need to use the key events present in the KEYDOWN class of Pygame. The events that are used over here are, K_UP, K_DOWN, K_LEFT, and K_RIGHT to make the snake move up,

down, left and right respectively. Also, the display screen is changed from the default black to white using the fill() method.

We have created new variables x1_change and y1_change in order to hold the updating values of the x and y coordinates.

CODE :

```
import pygame

 pygame.init()

 white = (255, 255, 255)

black = (0, 0, 0)

red = (255, 0, 0)

dis = pygame.display.set_mode((800, 600))

pygame.display.set_caption('Snake Game by Edureka')

game_over = False

x1 = 300

y1 = 300

x1_change = 0

y1_change = 0

clock = pygame.time.Clock()

while not game_over:
```

```
  for event in pygame.event.get():
      if event.type == pygame.QUIT:
          game_over = True
      if event.type == pygame.KEYDOWN:
          if event.key == pygame.K_LEFT:
              x1_change = -10
              y1_change = 0
          elif event.key == pygame.K_RIGHT:
              x1_change = 10
              y1_change = 0
          elif event.key == pygame.K_UP:
              y1_change = -10
              x1_change = 0
          elif event.key == pygame.K_DOWN:
              y1_change = 10
              x1_change = 0
   x1 += x1_change
y1 += y1_change
dis.fill(white)
```

```
pygame.draw.rect(dis, black, [x1, y1, 10, 10])
pygame.display.update()
clock.tick(30)
pygame.quit()
quit()
```

OUTPUT :

Game Over when Snake hits the boundaries:

In this snake game, if the player hits the boundaries of the screen, then he loses. To specify that, we have made use of an ‘if’ statement that

defines the limits for the x and y coordinates of the snake to be less than or equal to that of the screen.

CODE :

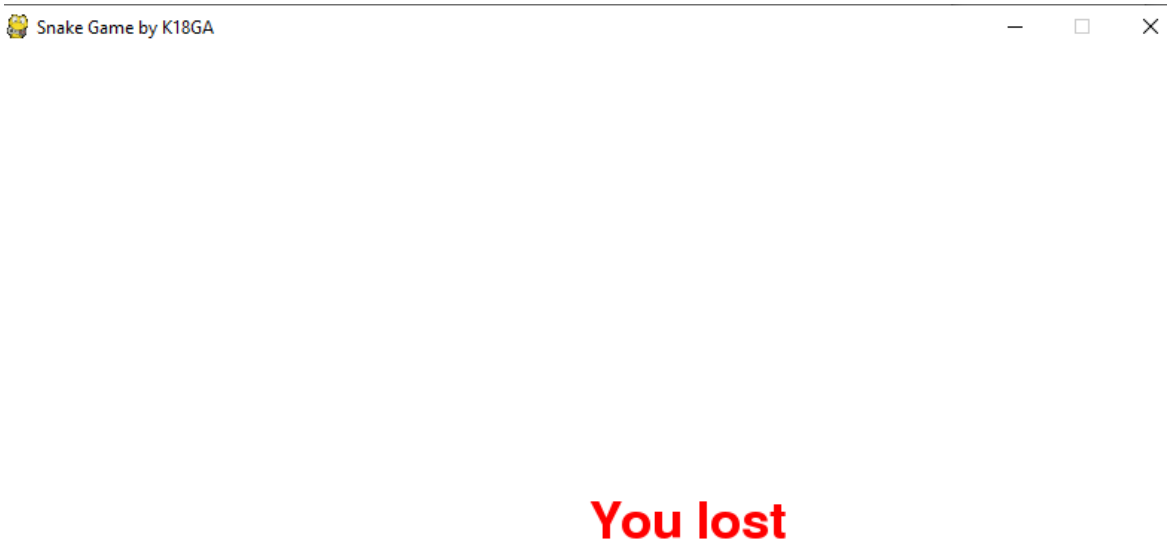
```
import pygame

import time

pygame.init()

white = (255, 255, 255)

black = (0, 0, 0)

red = (255, 0, 0)

dis_width = 800

dis_height  = 600

dis = pygame.display.set_mode((dis_width, dis_width))

pygame.display.set_caption('Snake Game by Edureka')

game_over = False


x1 = dis_width/2

y1 = dis_height/2


snake_block=10
```

```
x1_change = 0
y1_change = 0

clock = pygame.time.Clock()
snake_speed=30

font_style = pygame.font.SysFont(None, 50)

def message(msg,color):
    mesg = font_style.render(msg, True, color)
    dis.blit(mesg, [dis_width/2, dis_height/2])

while not game_over:
    for event in pygame.event.get():
        if event.type == pygame.QUIT:
            game_over = True
        if event.type == pygame.KEYDOWN:
            if event.key == pygame.K_LEFT:
```

```
            x1_change = -snake_block
            y1_change = 0
        elif event.key == pygame.K_RIGHT:
            x1_change = snake_block
            y1_change = 0
        elif event.key == pygame.K_UP:
            y1_change = -snake_block
            x1_change = 0
        elif event.key == pygame.K_DOWN:
            y1_change = snake_block
            x1_change = 0

if x1 >= dis_width or x1 < 0 or y1 >= dis_height or y1 < 0:
    game_over = True

x1 += x1_change
y1 += y1_change
dis.fill(white)
pygame.draw.rect(dis, black, [x1, y1, snake_block, snake_block])
```

```
    pygame.display.update()

    clock.tick(snake_speed)

message("You lost",red)
pygame.display.update()
time.sleep(2)

pygame.quit()
```

OUTPUT :



Adding the Food:

Here, we will be adding some food for the snake and when the snake crosses over that food, I will have a message saying “Yummy!!”. Also,

we will be making a small change wherein I will include the options to quit the game or to play again when the player loses.

CODE :

```
import pygame

import time

import random


pygame.init()


white = (255, 255, 255)

black = (0, 0, 0)

red = (255, 0, 0)

blue = (0, 0, 255)


dis_width = 800

dis_height = 600


dis = pygame.display.set_mode((dis_width, dis_height))

pygame.display.set_caption('Snake Game by Edureka')
```

```
clock = pygame.time.Clock()

snake_block = 10
snake_speed = 30

font_style = pygame.font.SysFont(None, 30)


def message(msg, color):
    mesg = font_style.render(msg, True, color)
    dis.blit(mesg, [dis_width/3, dis_height/3])


def gameLoop():  # creating a function
    game_over = False
    game_close = False

    x1 = dis_width / 2
```

```
    y1 = dis_height / 2


    x1_change = 0
    y1_change = 0


    foodx = round(random.randrange(0, dis_width - snake_block) / 10.0)
* 10.0
    foody = round(random.randrange(0, dis_width - snake_block) / 10.0)
* 10.0


    while not game_over:


        while game_close == True:
            dis.fill(white)
            message("You Lost! Press Q-Quit or C-Play Again", red)
            pygame.display.update()


            for event in pygame.event.get():
                if event.type == pygame.KEYDOWN:
                    if event.key == pygame.K_q:
```

```
                game_over = True
                game_close = False
            if event.key == pygame.K_c:
                gameLoop()

for event in pygame.event.get():
    if event.type == pygame.QUIT:
        game_over = True
    if event.type == pygame.KEYDOWN:
        if event.key == pygame.K_LEFT:
            x1_change = -snake_block
            y1_change = 0
        elif event.key == pygame.K_RIGHT:
            x1_change = snake_block
            y1_change = 0
        elif event.key == pygame.K_UP:
            y1_change = -snake_block
            x1_change = 0
        elif event.key == pygame.K_DOWN:
```

```
            y1_change = snake_block
            x1_change = 0

        if x1 >= dis_width or x1 < 0 or y1 >= dis_height or y1 < 0:
            game_close = True

        x1 += x1_change
        y1 += y1_change
        dis.fill(white)
        pygame.draw.rect(dis, blue, [foodx, foody, snake_block, snake_block])
        pygame.draw.rect(dis, black, [x1, y1, snake_block, snake_block])
        pygame.display.update()

        if x1 == foodx and y1 == foody:
            print("Yummy!!")
        clock.tick(snake_speed)

    pygame.quit()
    quit()
```

OUTPUT :

Terminal :

```
Hello from the pygame community.
Yummy!!
Yummy!!
Yummy!!
Yummy!!
Yummy!!
Yummy!!
Yummy!!
Yummy!!
```

Increasing the Length of the Snake:

The following code will increase the size of our sake when it eats the food. Also, if the snake collides with his own body, the game is over and you ill see a message as “You Lost! Press Q-Quit or C-Play Again“. The length of the snake is basically contained in a list and the initial size that is specified in the following code is one block.

CODE :

```
import pygame

import time

import random


pygame.init()


white = (255, 255, 255)

yellow = (255, 255, 102)

black = (0, 0, 0)

red = (213, 50, 80)

green = (0, 255, 0)

blue = (50, 153, 213)


dis_width = 600
```

```
dis_height = 400

dis = pygame.display.set_mode((dis_width, dis_height))
pygame.display.set_caption('Snake Game by Edureka')

clock = pygame.time.Clock()

snake_block = 10
snake_speed = 15

font_style = pygame.font.SysFont("bahnschrift", 25)
score_font = pygame.font.SysFont("comicsansms", 35)

def our_snake(snake_block, snake_list):
    for x in snake_list:
        pygame.draw.rect(dis, black, [x[0], x[1], snake_block, snake_block])


def message(msg, color):
```

```
    mesg = font_style.render(msg, True, color)
    dis.blit(mesg, [dis_width / 6, dis_height / 3])


def gameLoop():
    game_over = False
    game_close = False

    x1 = dis_width / 2
    y1 = dis_height / 2

    x1_change = 0
    y1_change = 0

    snake_List = []
    Length_of_snake = 1

    foodx = round(random.randrange(0, dis_width - snake_block) / 10.0)
* 10.0
```

```
    foody = round(random.randrange(0, dis_height - snake_block) / 10.0)
* 10.0


    while not game_over:


        while game_close == True:
            dis.fill(blue)
            message("You Lost! Press C-Play Again or Q-Quit", red)


            pygame.display.update()


            for event in pygame.event.get():
                if event.type == pygame.KEYDOWN:
                    if event.key == pygame.K_q:
                        game_over = True
                        game_close = False
                    if event.key == pygame.K_c:
                        gameLoop()


        for event in pygame.event.get():
```

```
    if event.type == pygame.QUIT:
        game_over = True
    if event.type == pygame.KEYDOWN:
        if event.key == pygame.K_LEFT:
            x1_change = -snake_block
            y1_change = 0
        elif event.key == pygame.K_RIGHT:
            x1_change = snake_block
            y1_change = 0
        elif event.key == pygame.K_UP:
            y1_change = -snake_block
            x1_change = 0
        elif event.key == pygame.K_DOWN:
            y1_change = snake_block
            x1_change = 0

if x1 >= dis_width or x1 < 0 or y1 >= dis_height or y1 < 0:
    game_close = True
x1 += x1_change
```

```
        y1 += y1_change
        dis.fill(blue)
        pygame.draw.rect(dis, green, [foodx, foody, snake_block, snake_block])
        snake_Head = []
        snake_Head.append(x1)
        snake_Head.append(y1)
        snake_List.append(snake_Head)
        if len(snake_List) > Length_of_snake:
            del snake_List[0]

        for x in snake_List[:-1]:
            if x == snake_Head:
                game_close = True

        our_snake(snake_block, snake_List)



        pygame.display.update()
```

```
        if x1 == foodx and y1 == foody:
            foodx = round(random.randrange(0, dis_width - snake_block) /
10.0) * 10.0
            foody = round(random.randrange(0, dis_height - snake_block) /
10.0) * 10.0
            Length_of_snake += 1

        clock.tick(snake_speed)

    pygame.quit()
    quit()


gameLoop()
```

Displaying the Score:

Last but definitely not the least, we need to display the score of the player. To do this, I have created a new function as “Your_score”. This function will display the length of the snake subtracted by 1 because that is the initial size of the snake.

CODE :

```
import pygame

import time

import random


pygame.init()


white = (255, 255, 255)

yellow = (255, 255, 102)

black = (0, 0, 0)

red = (213, 50, 80)

green = (0, 255, 0)

blue = (50, 153, 213)
```

```
dis_width = 600

dis_height = 400


dis = pygame.display.set_mode((dis_width, dis_height))

pygame.display.set_caption('Snake Game by Edureka')


clock = pygame.time.Clock()


snake_block = 10

snake_speed = 15


font_style = pygame.font.SysFont("bahnschrift", 25)

score_font = pygame.font.SysFont("comicsansms", 35)



def Your_score(score):

    value = score_font.render("Your Score: " + str(score), True, yellow)

    dis.blit(value, [0, 0])
```

```
def our_snake(snake_block, snake_list):
    for x in snake_list:
        pygame.draw.rect(dis, black, [x[0], x[1], snake_block, snake_block])



def message(msg, color):
    mesg = font_style.render(msg, True, color)
    dis.blit(mesg, [dis_width / 6, dis_height / 3])



def gameLoop():
    game_over = False
    game_close = False

    x1 = dis_width / 2
    y1 = dis_height / 2
```

```
    x1_change = 0
    y1_change = 0

    snake_List = []
    Length_of_snake = 1

    foodx = round(random.randrange(0, dis_width - snake_block) / 10.0)
* 10.0
    foody = round(random.randrange(0, dis_height - snake_block) / 10.0)
* 10.0

    while not game_over:

        while game_close == True:
            dis.fill(blue)
            message("You Lost! Press C-Play Again or Q-Quit", red)
            Your_score(Length_of_snake - 1)
            pygame.display.update()
```

```
    for event in pygame.event.get():
        if event.type == pygame.KEYDOWN:
            if event.key == pygame.K_q:
                game_over = True
                game_close = False
            if event.key == pygame.K_c:
                gameLoop()


for event in pygame.event.get():
    if event.type == pygame.QUIT:
        game_over = True
    if event.type == pygame.KEYDOWN:
        if event.key == pygame.K_LEFT:
            x1_change = -snake_block
            y1_change = 0
        elif event.key == pygame.K_RIGHT:
            x1_change = snake_block
            y1_change = 0
        elif event.key == pygame.K_UP:
```

```
            y1_change = -snake_block
            x1_change = 0
        elif event.key == pygame.K_DOWN:
            y1_change = snake_block
            x1_change = 0

    if x1 >= dis_width or x1 < 0 or y1 >= dis_height or y1 < 0:
        game_close = True
    x1 += x1_change
    y1 += y1_change
    dis.fill(blue)
    pygame.draw.rect(dis, green, [foodx, foody, snake_block, snake_block])
    snake_Head = []
    snake_Head.append(x1)
    snake_Head.append(y1)
    snake_List.append(snake_Head)
    if len(snake_List) > Length_of_snake:
        del snake_List[0]
```

```
        for x in snake_List[:-1]:
            if x == snake_Head:
                game_close = True

        our_snake(snake_block, snake_List)
        Your_score(Length_of_snake - 1)

        pygame.display.update()

        if x1 == foodx and y1 == foody:
            foodx = round(random.randrange(0, dis_width - snake_block) /
10.0) * 10.0
            foody = round(random.randrange(0, dis_height - snake_block) /
10.0) * 10.0
            Length_of_snake += 1

        clock.tick(snake_speed)
    pygame.quit()
    quit()
gameLoop()
```

OUTPUT: