TASK 12 - Simulate Gaming Concepts using pygame

Aim: TO simulate gaming concepts using Python.

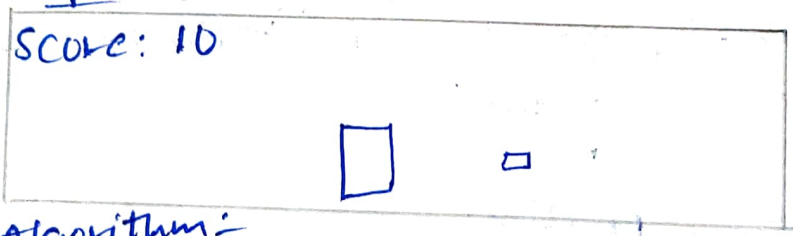
Snake Game:

Problem 1: write a python program to create a snake game.

Conditions:

1. set the window size
2. create a snake
3. Make the snake to move in the directions when left, right, down and up is pressed.
5. If the snake hits the windows. Game over

Sample output:



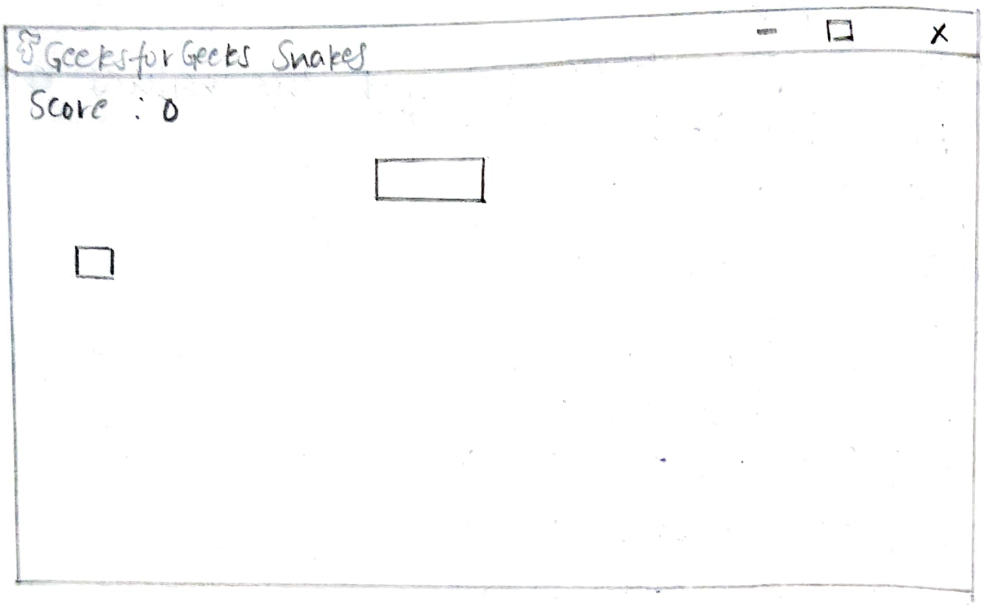
Algorithm:

1. Import pygame package and initialize it.
2. Define the window size and title
3. create a snake class which initializes the snake position, color, and movement.
4. create a function to check if the snake collides with the fruit and increases the score.
5. create a game loop to continuously update the game display, snake position, and check for collisions.
6. End the game if the user quits or the snake collides with the window.

Program:

```
#importing libraries
import pygame
import time
import random
snake_speed = 15
#window size
window_x = 720
window_y = 480
#defining colors
```

Output :-



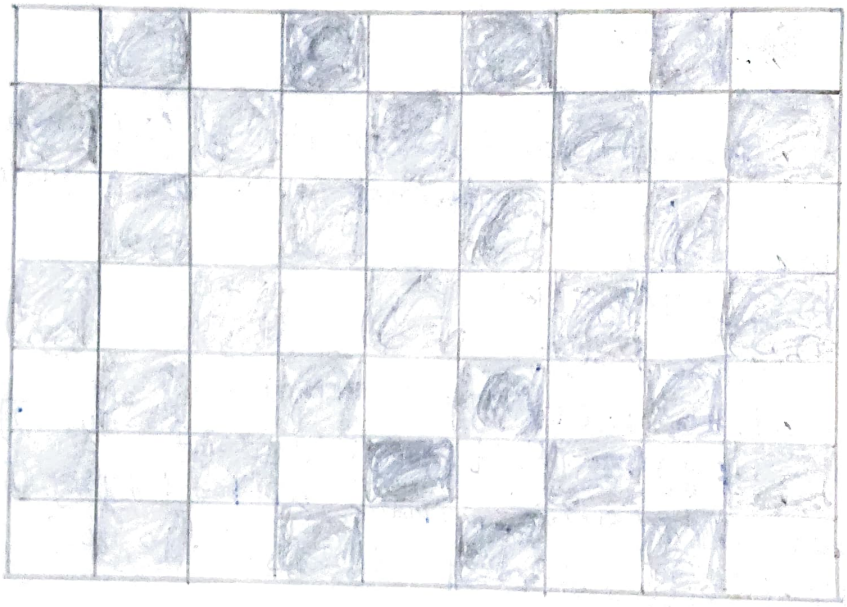
```
black = pygame.color(0,0,0)
white = pygame.color(255,255,255)
red = pygame.color(255,0,0)
green = pygame.color(0,255,0)
blue = pygame.color(0,0,255)
#initialising pygame
Pygame.init()
#initialise game window
Pygame.display.set_caption('Geeks-for-geeks snakes')
game-window = pygame.display.set_mode((window_x,window_y))
#FPS (frames per second) controller
fps = pygame.time.clock()
#defining snake default position
snake_position = [100, 50]
#defining first 4 blocks of snake body
snake_body = [[100,50],
              [90,50],
              [80,50],
              [70,50]
              ]
# fruit position
fruit_position = [random.randrange(1,(window_x//10)*10,
                  random.randrange(1,(window_y//10)*10)
fruit_position = True
#setting default snake direction towards
# right
direction = 'RIGHT'
change_to = direction
#initial score
score = 0
```

```
#displaying score function
def show_score(choice, color, font, size):
#creating font objects score_font
score_font = pygame.font.SysFont(font,size)
#create the display surface object
# score_surface
score_surface = score_font.render('score:'+str(score),True,color)
#create a rectangular object for the text
# surface object
score_rect= score_surface.get_rect()
#displaying text
game_window.blit(score_surface,score_rect)
# game over function
def game_over():
#creating font object my_font
my_font = pygame.font.SysFont('times new roman',50)
#creating a text surface on which text
# will be drawn
game_over_surface = my_font.render(
    'your score is: '+str(score),True,red)
#create a rectangular object for the text
# surface object
game_over_rect = game_over_surface.get_rect()
# setting position of the text
game_over_rect.midtop= (window_x/2,window_y/4)
#blit will draw the text on screen
game_window.blit(game_over_surface,game_over_rect)
pygame.display.flip()
#after 2 seconds we will quit the program
time.sleep(2)
#deactivating pygame library
pygame.quit()
```

```
# quit the program
quit()
# Main Function
while True:
# handling key events
for event in pygame.event.get():
    if event.type == pygame.KEYDOWN:
        if event.key == pygame.K_UP:
            change_to = 'UP'
        if event.key == pygame.K_DOWN:
            change_to = 'DOWN'
        if event.key == pygame.K_LEFT:
            change_to = 'LEFT'
        if event.key == pygame.K_RIGHT:
            change_to = 'RIGHT',
# If two keys pressed simultaneously
# we don't want snake to move into two
# directions simultaneously
if change_to == 'UP' and direction != 'DOWN':
    direction = 'UP'
if change_to == 'DOWN' and direction != 'UP':
    direction = 'DOWN'
if change_to == 'LEFT' and direction != 'RIGHT':
    direction = 'LEFT'
if change_to == 'RIGHT' and direction != 'LEFT':
    direction = 'RIGHT'
# Moving the snake
if direction == 'UP':
    snake_position[1] -= 10
if direction == 'DOWN':
    snake_position[1] += 10
if direction == 'LEFT':
    snake_position[0] -= 10
if direction == 'RIGHT':
    snake_position[0] += 10
```

```
# snake body growing mechanism
# if fruits and snakes collide then scores
# will be incremented by 10
snake_body.insert(0, list(snake_position))
if snake_position[0] == fruit_position[0] and snake_
position[1] == fruit_position[1]:
    score += 10
    fruit_spawn = False
else:
    snake_body.pop()
if not fruit_spawn:
    fruit_position = [random.randrange(1, (window_x//10))*10,
                      random.randrange(1, (window_y//10))*10]
fruit_spawn = True
game_window.fill(black)
for pos in snake_body:
    pygame.draw.rect(game_window, green)
                     pygame.Rect(pos[0], pos[1], 10, 10)]
pygame.draw.rect(game_window, white, pygame.Rect(
    fruit_position[0], fruit_position[1], 10, 10))
# Game over conditions
if snake_position[0]<0 or snake_position[0]>window_x-10:
    game_over()
if snake_position[1]<0 or snake_position[1]>window_y-10:
    game_over()
# touching the snake body
for block in snake_body[1:]:
    if snake_position[0] == block[0] and snake_position[1]==
                                          block[1]:
        game_over()
# displaying score continuously
show_score(1, white, 'times new roman', 20)
# Refresh game screen
pygame.display.update()
# Frame per second / Refresh Rate
fps.tick(snake_speed)
```

Output :-



Problem 2 :- Write a python program to Develop a Chess board using pygame.

Algorithm :-

1. Import pygame and initialize it.
2. set screen size and title
3. Define colors for the board and pieces.
4. Define a function to draw the pieces on the board by loading images for each piece and placing them on the corresponding square.
5. Define the initial state of the board as a list of lists containing the pieces.
6. start the game loop.

Program :-

```
import pygame
#Initialize pygame
pygame.init()
# set screen size and title
screen_size = (640,640)
 screen = pygame.display.set_mode(screen_size)
pygame.display.set_caption('Chess Board')
# Define colors
black = (0,0,0)
white = (255, 255, 255)
brown = (153, 76, 0)
# Define function to draw the board
def draw_board():
    for row in range(8):
        for col in range(8):
            square_color = white if (row+col)%2==0 else brown
            square_rect = pygame.Rect(col*80, row*80,80,80)
            pygame.draw.rect(screen, color, square_rect)
# Define function to draw the pieces
def draw_pieces(board):
  piece_images = {
    'r': pygame.image.load('image\rook.png'),
```

```
        'n': pygame.image.load('images/knight.png'),
        'b': pygame.image.load('images/bishop.png'),
        'q': pygame.image.load('images/queen.png'),
        'k': pygame.image.load('images/king.png'),
        'p': pygame.image.load('images/pawn.png')
    }
    for row in range(8):
        for col in range(8):
            piece = board[row][col]
            if piece != '-':
                piece_image = piece_images[piece]
                piece_rect = pygame.Rect(col*80, row*80, 80, 80)
                screen.blit(piece_image, piece_rect)
# Define initial state of the board
board = [
    ['r', 'n', 'b', 'q', 'k', 'b', 'n', 'r'],
    ['p', 'p', 'p', 'p', 'p', 'p', 'p', 'p'],
    ['.', '.', '.', '.', '.', '.', '.', '.'],
    ['.', '.', '.', '.', '.', '.', '.', '.'],
    ['.', '.', '.', '.', '.', '.', '.', '.'],
    ['.', '.', '.', '.', '.', '.', '.', '.'],
    ['P', 'P', 'P', 'P', 'P', 'P', 'P', 'P'],
    ['R', 'N', 'B', 'Q', 'K', 'B', 'N', 'R']
]
# Draw board and pieces
draw_board()
draw_pieces(board)
# Start game loop
while True:
    for event in pygame.event.
        if event.type == pygame.
            pygame.quit()
            quit()
pygame.display.update()
```

VEL TECH	
EXPERIMENT	12
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	5
RECORD (5)	20
TOTAL (20)	15/10
SIGN WITH DATE	

Result: Thus, the program for Pygame is executed and verified successfully.