SNAKE BITE

A PROJECT REPORT

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➢ Project Overview:

- Snake Eater is a classic arcade-style game implemented using PyGame, a popular Python library for game development. The game provides a nostalgic experience reminiscent of the original Snake game found on early mobile phones. Players control a snake that moves around the game window, consuming food items to grow in length while avoiding collision with obstacles and its own body.

➢ Project Components:

- Main Script (snake.py):
  - The main script serves as the entry point of the game.
  - It handles game initialization, event handling, game logic, and rendering.
  - Implements the main game loop responsible for continuously updating the game state and rendering graphics.

- Modules and Libraries:

- PyGame: PyGame is a cross-platiorm set of Python modules designed for writing video games. It provides functionality for handling graphics, user input, sound, and more.
- Sys: The sys module provides access to some variables used or maintained by the Python interpreter and to functions that interact strongly with the interpreter.

- Time: The me module provides various me-related functions, such as introducing delays or measuring me intervals.
- Random: The random module provides functions for genera ng random numbers, which are used in this project for spawning food items at random positions.

  """

Snake Eater Source code :

```
import pygame, sys, time, random


# Difficulty settings
# Easy      -> 10
# Medium    -> 25
# Hard      -> 40
# Harder    ->  60
# Impossible-> 120
difficulty = 25

# Window size
frame_size_x = 720
frame_size_y = 480

# Checks for errors encountered
check_errors = pygame.init()
# pygame.init() example output -> (6, 0)
# second number in tuple gives number of errors
if check_errors[1] > 0:
    print(f'[!] Had {check_errors[1]} errors when initialising game,
exiting...')
    sys.exit(-1)
else:
    print('[+] Game successfully initialised')
```

```
# Initialise game window
pygame.display.set_caption('Snake Eater')
game_window = pygame.display.set_mode((frame_size_x,
frame_size_y))


# Colors (R, G, B)
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)


# FPS (frames per second) controller
fps_controller = pygame.time.Clock()


# Game variables
snake_pos = [100, 50]
snake_body = [[100, 50], [100-10, 50], [100-(2*10), 50]]

food_pos = [random.randrange(1, (frame_size_x//10)) * 10,
random.randrange(1, (frame_size_y//10)) * 10]
food_spawn = True

direction = 'RIGHT'
change_to = direction

score = 0


# Game Over
```

```
def game_over():
    my_font = pygame.font.SysFont('times new roman', 90)
    game_over_surface = my_font.render('YOU DIED', True, red)
    game_over_rect = game_over_surface.get_rect()
    game_over_rect.midtop = (frame_size_x/2, frame_size_y/4)
    game_window.fill(black)
    game_window.blit(game_over_surface, game_over_rect)
    show_score(0, red, 'times', 20)
    pygame.display.flip()
    time.sleep(3)
    pygame.quit()
    sys.exit()


# Score
def show_score(choice, color, font, size):
    score_font = pygame.font.SysFont(font, size)
    score_surface = score_font.render('Score : ' + str(score), True,
color)
    score_rect = score_surface.get_rect()
    if choice == 1:
        score_rect.midtop = (frame_size_x/10, 15)
    else:
        score_rect.midtop = (frame_size_x/2, frame_size_y/1.25)
    game_window.blit(score_surface, score_rect)
    # pygame.display.flip()


# Main logic
while True:
    for event in pygame.event.get():
        if event.type == pygame.QUIT:
            pygame.quit()
            sys.exit()
```

```
        # Whenever a key is pressed down
        elif event.type == pygame.KEYDOWN:
            # W -> Up; S -> Down; A -> Left; D -> Right
            if event.key == pygame.K_UP or event.key == ord('w'):
                change_to = 'UP'
            if event.key == pygame.K_DOWN or event.key == ord('s'):
                change_to = 'DOWN'
            if event.key == pygame.K_LEFT or event.key == ord('a'):
                change_to = 'LEFT'
            if event.key == pygame.K_RIGHT or event.key == ord('d'):
                change_to = 'RIGHT'
            # Esc -> Create event to quit the game
            if event.key == pygame.K_ESCAPE:
                pygame.event.post(pygame.event.Event(pygame.QUIT))

    # Making sure the snake cannot move in the opposite direction
instantaneously
    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_pos[1] -= 10
    if direction == 'DOWN':
        snake_pos[1] += 10
    if direction == 'LEFT':
        snake_pos[0] -= 10
    if direction == 'RIGHT':
```

```
        snake_pos[0] += 10

    # Snake body growing mechanism
    snake_body.insert(0, list(snake_pos))
    if snake_pos[0] == food_pos[0] and snake_pos[1] == food_pos[1]:
        score += 1
        food_spawn = False
    else:
        snake_body.pop()

    # Spawning food on the screen
    if not food_spawn:
        food_pos = [random.randrange(1, (frame_size_x//10)) * 10,
random.randrange(1, (frame_size_y//10)) * 10]
    food_spawn = True

    # GFX
    game_window.fill(black)
    for pos in snake_body:
        # Snake body
        # .draw.rect(play_surface, color, xy-coordinate)
        # xy-coordinate -> .Rect(x, y, size_x, size_y)
        pygame.draw.rect(game_window, green, pygame.Rect(pos[0],
pos[1], 10, 10))

    # Snake food
    pygame.draw.rect(game_window, white, pygame.Rect(food_pos[0],
food_pos[1], 10, 10))

    # Game Over conditions
    # Getting out of bounds
    if snake_pos[0] < 0 or snake_pos[0] > frame_size_x-10:
        game_over()
    if snake_pos[1] < 0 or snake_pos[1] > frame_size_y-10:
```

```
        game_over()
    # Touching the snake body
    for block in snake_body[1:]:
        if snake_pos[0] == block[0] and snake_pos[1] == block[1]:
            game_over()

    show_score(1, white, 'consolas', 20)
    # Refresh game screen
    pygame.display.update()
    # Refresh rate
    fps_controller.tick(difficulty)
```

➢ Features:

- ➢ Snake Movement and Controls:
  - Players can control the movement of the snake using arrow keys or the WASD keys.
  - The snake moves continuously in the direction specified by the player un l a change in direction is initiated.

- ➢ Food Spawning and Consumption:
  - Food items spawn at random positions within the game
    - window.
  - When the snake's head collides with a food item, the snake grows in length, and the player's score increases.

- ➢ Score Tracking and Display:
  - The game keeps track of the player's score, which increments each me the snake consumes food.
  - The current score is displayed on the game screen for the player to see during gameplay.

- ➢ Game Over Conditions:

- The game ends when the snake collides with the boundaries of the game window or with its own body. o Upon game over, a "YOU DIED" message is displayed along with the player's final score.

➢ Configuration:

- Difficulty Levels:
  - The game offers adjustable difficulty levels, ranging from Easy to Impossible.
  - Difficulty affects the speed of the snake's movement, making the game more challenging at higher difficulty levels.
- Window Size and Colors:
  - The size of the game window is customizable, allowing players to adjust the display according to their preferences.
  - Colors for the snake, food items, and other game elements can be customized to enhance visual appeal.

➢ Development Details:

- Error Handling:
  - The project includes error handling mechanisms to detect initializa on errors during startup.
  - If initializa on errors occur, the game gracefully exits with an error message, ensuring a smooth user experience.

- Key Event Handling:
  - The game listens for key press events to control the snake's movement and to handle game exit events.
  - Key mappings for movement (arrow keys and WASD) are implemented to provide flexibility for players.

- Snake Movement and Growth:

- The snake's movement is updated based on the player's input and game logic, ensuring smooth and responsive controls.
- When the snake consumes food, its length increases, simulating growth and adding to the challenge of navigating the game environment.

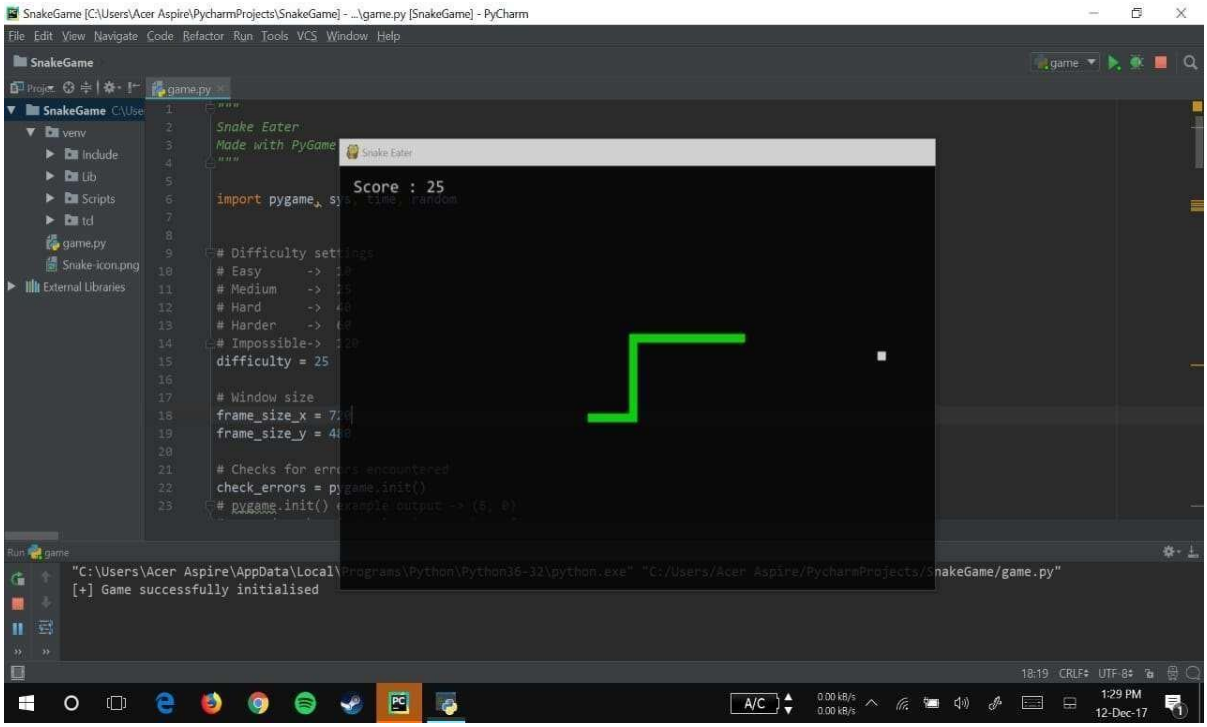
- Food Spawning Logic:
    - Food items spawn at random positions within the game window, ensuring variety in gameplay and preventing predictability.
    - A mechanism is in place to prevent food from spawning on top of the snake's body, ensuring fair gameplay.

- Game Over Screen:
    - Upon detecting game over conditions, such as collision with boundaries or the snake's own body, the game displays a "YOU DIED" message.
    - The final score achieved by the player is also shown on the game over screen, providing feedback and encouraging replayability.

➢ Conclusion:

- The Snake Eater project showcases the implementation of a classic arcade game using Python and PyGame. With its engaging gameplay mechanics, customizable and intuitive controls, the game offers players an enjoyable gaming experience. Whether you're a seasoned player looking for a nostalgic throwback or a beginner exploring game development, Snake Eater provides entertainment and learning opportunities in equal measure.

- This should make it easier for readers to navigate through the document and find specific sections they're interested in. Let me know if you need any further adjustments!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SnakeGame
game.py
Snake Eater
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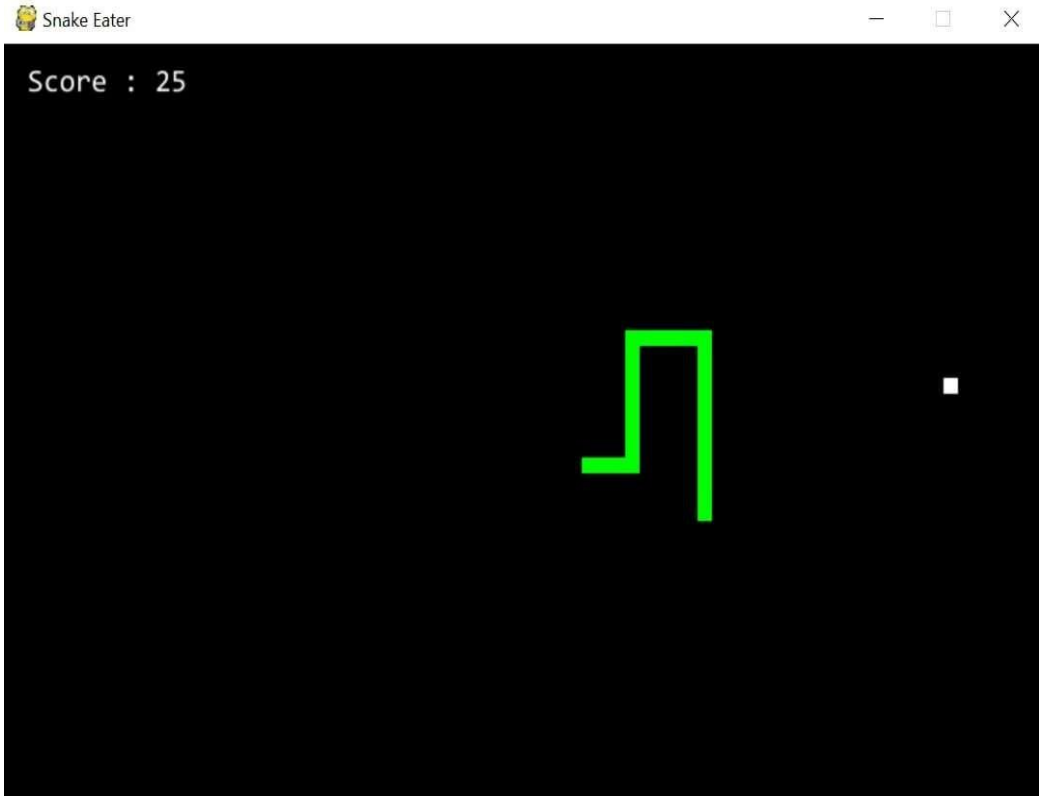
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