Unit:3; Class:5

Pygame

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Introduction to Pygame

What is Pygame?

- A Python library for creating **2D games and multimedia applications**.
- Built on **SDL (Simple DirectMedia Layer)**.
- Handles **graphics, sound, and user input** easily.

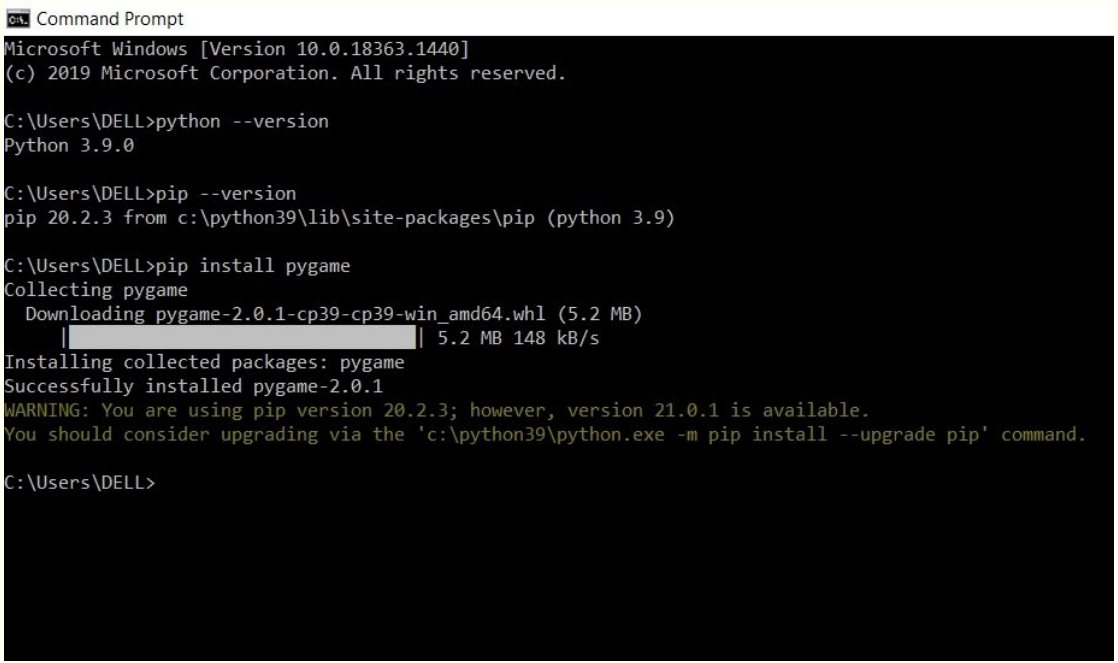
Installing Pygame

- Open your terminal or command prompt and run:

```
pip install pygame
```

- To check if Pygame is installed:

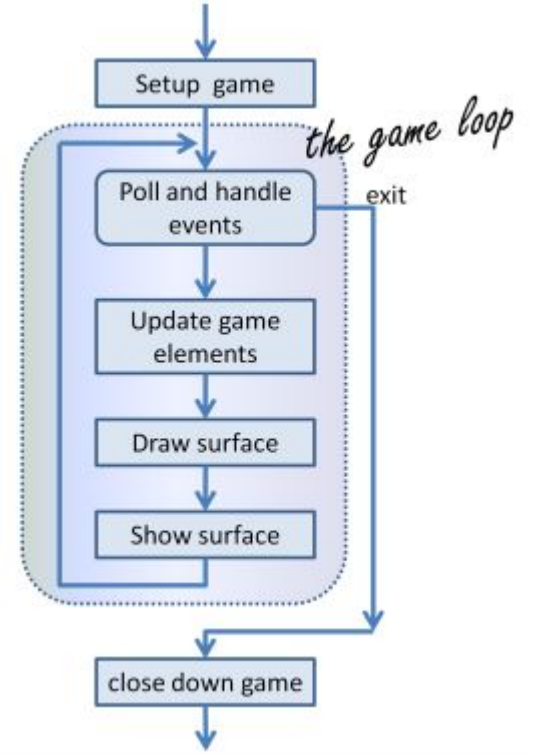
```
import pygame
print(pygame.__version__)
```



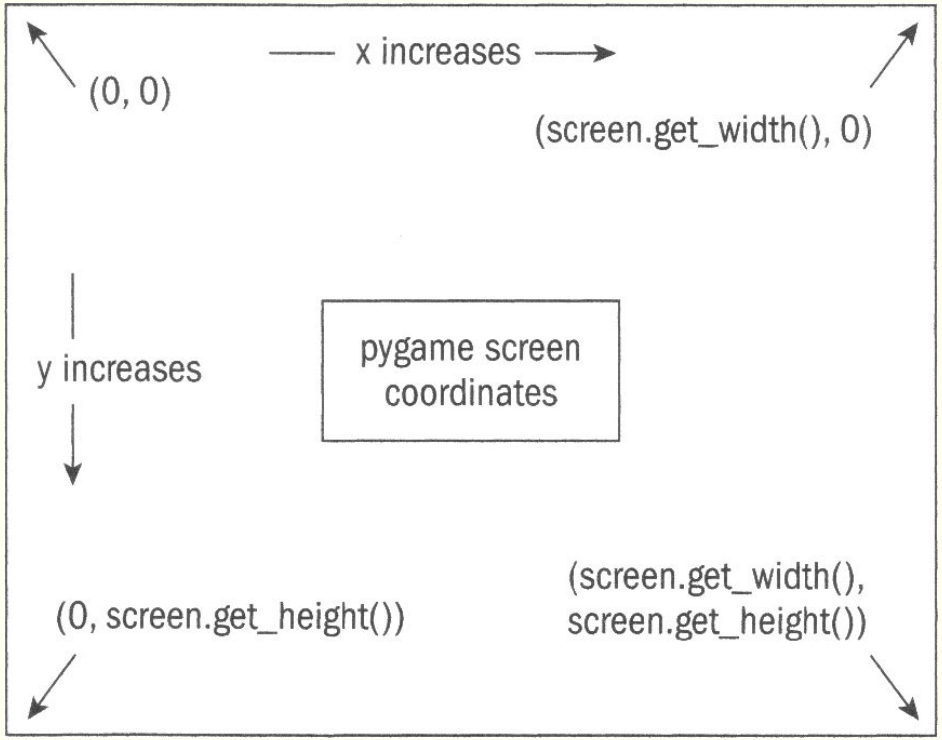
Pygame Structure

Every Pygame program follows these steps:

1. **Initialize Pygame**
2. **Create a game window**
3. **Game loop (event handling, updating, drawing)**
4. **Quit Pygame**



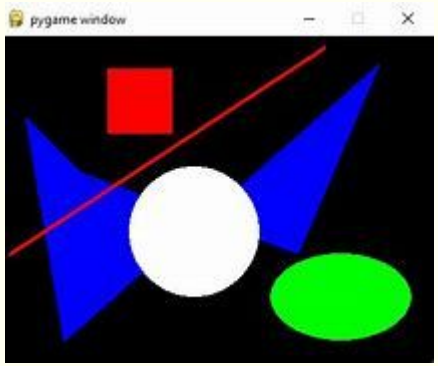
Basic Pygame Window

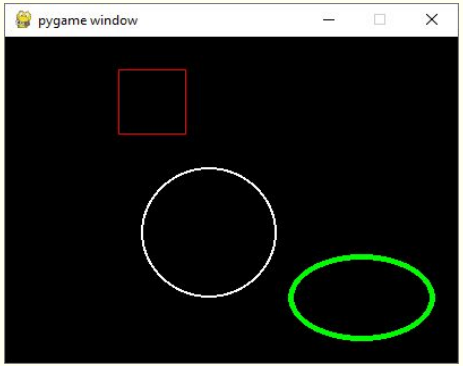


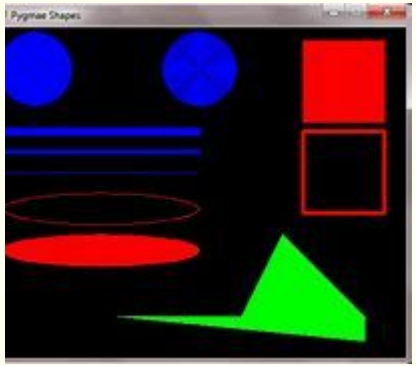

```python
import pygame

# Initialize Pygame
pygame.init()

# Create a window
screen = pygame.display.set_mode((500, 400))
pygame.display.set_caption("My First Game")

# Game loop
running = True
while running:
    for event in pygame.event.get():
        if event.type == pygame.QUIT:
            running = False

# Quit Pygame
pygame.quit()
```

✅ **Practice Task:** Modify the screen size and title.

Drawing Shapes in Pygame








```python
import pygame

pygame.init()
screen = pygame.display.set_mode((500, 400))

# Colors
WHITE = (255, 255, 255)
RED = (255, 0, 0)
BLUE = (0, 0, 255)

running = True
while running:
    for event in pygame.event.get():
        if event.type == pygame.QUIT:
            running = False

    screen.fill(WHITE)  # Fill screen with white
    pygame.draw.rect(screen, RED, (50, 50, 100, 50))  # Draw red rectangle
    pygame.draw.circle(screen, BLUE, (250, 200), 40)  # Draw blue circle

    pygame.display.update()

pygame.quit()
```

✅ **Practice Task:** Draw a triangle and a line.

Handling User Input

✅ **Practice Task:** Detect arrow key presses and print which key is pressed.

```python
import pygame

pygame.init()
screen = pygame.display.set_mode((500, 400))
WHITE = (255, 255, 255)
running = True

while running:
    for event in pygame.event.get():
        if event.type == pygame.QUIT:
            running = False
        if event.type == pygame.KEYDOWN:
            if event.key == pygame.K_SPACE:
                print("Space key pressed!")

    screen.fill(WHITE)
    pygame.display.update()

pygame.quit()
```

Moving a Shape with Arrow Keys

✅ **Practice Task:** Change the shape to a circle and move it diagonally.

```python
import pygame

pygame.init()
screen = pygame.display.set_mode((500, 400))
WHITE = (255, 255, 255)
RED = (255, 0, 0)

x, y = 200, 200  # Initial position

running = True
while running:
    for event in pygame.event.get():
        if event.type == pygame.QUIT:
            running = False
    keys = pygame.key.get_pressed()
    if keys[pygame.K_LEFT]: x -= 5
    if keys[pygame.K_RIGHT]: x += 5
    if keys[pygame.K_UP]: y -= 5
    if keys[pygame.K_DOWN]: y += 5

    screen.fill(WHITE)
    pygame.draw.rect(screen, RED, (x, y, 50, 50))  # Draw red rectangle
    pygame.display.update()

pygame.quit()
```

Creating a Simple Game - Catch the Ball

✅ **Practice Task:** Add a score counter to track how many balls are caught

Conclusion & Real-World Applications

🔹 **Why learn Pygame?**

- Builds problem-solving skills.
- Introduction to game development logic.
- Fun way to learn Python programming.

🔹 **Real-world applications:**

- Game development.
- Interactive simulations.
- Graphical applications in Python.

✅ **Final Challenge:** Create a **Paddle & Ball** game similar to **Pong!**

Thank You

Do the Quiz Please, you have 10 minutes to do that!