Pygame Fun Lesson Plan: Build "Catch the Point" Game!

🌟 Goal of Today's Game

- Move a player on the screen
- Catch the green "point" to score
- Win when you reach 3 points!

📚 Part 1: Setting Up Pygame

What We Will Do:

- Import pygame, sys, random
- Initialize Pygame
- Create the game window

Code:

```
import pygame
import sys
import random

pygame.init()
screen = pygame.display.set_mode((800, 600))
pygame.display.set_caption("My First Pygame Window!")
```

🔹 Notes:

- `pygame.init()` starts everything.
- The screen size is 800 pixels wide, 600 pixels tall.

👾 Part 2: Creating the Player and Point

What We Will Do:

- Make a red rectangle (the player)
- Make a green rectangle (the point)
- Set up colors and movement speed

Code:

```
player = pygame.Rect(300, 200, 50, 50)
point = pygame.Rect(100, 50, 50, 50)
player_speed = 1

WHITE = (255, 255, 255)
RED = (255, 0, 0)
GREEN = (0, 199, 100)
```

🔹 Notes:

- `pygame.Rect(x, y, width, height)` makes rectangles easily!
- Colors are made using RGB values.

🌟 Part 3: Adding the Score

What We Will Do:

- Start the score at 0
- Create a font to display the score

Code:

```
score = 0
font = pygame.font.SysFont(None, 36)
```

🔹 Notes:

- `SysFont(None, 36)` uses the default font, size 36.

💡 Part 4: Moving the Player

What We Will Do:

- Detect arrow key presses
- Move the player

Code:

```
keys = pygame.key.get_pressed()
if keys[pygame.K_LEFT]:
    player.x -= player_speed
if keys[pygame.K_RIGHT]:
    player.x += player_speed
if keys[pygame.K_UP]:
    player.y -= player_speed
if keys[pygame.K_DOWN]:
    player.y += player_speed
```

🔹 Notes:

- `key.get_pressed()` checks if a key is *being held down*.

💪 Part 5: Keeping Player On-Screen

What We Will Do:

- Prevent the player from leaving the window

Code:

```
if player.left < 0:
    player.left = 0
if player.right > 800:
    player.right = 800
if player.top < 0:
    player.top = 0
```

```
if player.bottom > 600:
    player.bottom = 600
```

🔹 Notes:

- Always clamp edges so the player doesn't disappear!

🛡️ Part 6: Catching the Point

What We Will Do:

- Check if player touches point
- Add 1 to score
- Move point to random new location

Code:

```
if player.colliderect(point):
    score += 1
    point.x = random.randint(0, 750)
    point.y = random.randint(0, 550)
```

🔹 Notes:

- Stop at 750 and 550 so point doesn't spawn off screen!

🏆 Part 7: Winning the Game!

What We Will Do:

- If score >= 3, show "YOU WIN!!"
- Change background color to green

Code:

```
if score >= 3:
    screen.fill(GREEN)
    win_text = font.render("YOU WIN!!", True, WHITE)
    screen.blit(win_text, (300, 300))
else:
    screen.fill(WHITE)
    pygame.draw.rect(screen, RED, player)
    pygame.draw.rect(screen, GREEN, point)
    score_text = font.render(f"Score {score}", True, (0, 0, 0))
    screen.blit(score_text, (0, 0))
```

🔹 Notes:

- We only draw the player and point when we are still playing.

🔄 Part 8: Updating the Screen

What We Will Do:

- Refresh the screen every frame

Code:

```
pygame.display.update()
```

🔹 Notes:

- `update()` redraws everything you've changed!

📊 Full Game Loop Checklist

- Handle events (like quitting)
- Move player
- Keep player inside
- Check if player caught point

- Draw everything
- Update the screen

🎉 End of Lesson

Congratulations! You've made your first mini-game in Pygame!

What's next?

- Try adding a timer
- Make the player faster
- Add more points to catch!

Good luck and have fun! 🌟