LAPORAN PROJECT UTS
GRAFIKA KOMPUTER

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Daftar isi

Latar Belakang

Dunia hiburan sudah menjadi kebutuhan manusia, mulai dari musik, nonton film, olahraga, dan bermain game. Bermain game merupakan hiburan yang paling mudah ditemukan saat ini, saat ini game sudah gampang ditemukan di mobile, website, dan juga desktop pc kita.

Game merupakan hal yang lumrah untuk semua kalangan terlepas dari usia yang masih anak-anak, remaja, hingga dewasa. Untuk melepas penat dari aktivitas kesibukan mereka, game selalu menjadi tempat yang baik untuk bisa kita salurkan

Tujuan

Project game sederhana ini bertujuan untuk memberikan hiburan. Game yang akan dibuat sengaja sederhana guna untuk bisa dimainkan disemua kalangan, selain itu game ini juga bisa dimainkan multiplayer sehingga cocok untuk bisa dimainkan 2 orang atau dibuat kompetisi sederhana.

Teori

Acuan dari game ini adalah game multiplayer yang bisa dimainkan secara offline. Gambaran dari game ini seperti orang bermain tenis meja, tetapi mekanisme game ini dibuat lebih sederhana sehingga tidak sulit dimainkan.

Akan tetapi, game ini juga mempunya tantangan berupa kecepatan bola yang akan terus bertambah setiap mili detiknya, sehingga tingkat kesulitannya akan terus bertambah.

Game ini memiliki batasan score yaitu maksimal nya adalah 3. Score dengan nilai tersebut yang paling efektif untuk bermain game ini dari segi waktu dan tingkat kesulitan.

Fungsi - Fungsi

Import Library yang dibutuhkan

```
import pygame
from pygame import gfxdraw
import random
```

```
import os
```

Inisialisasi screen monitor

```
pygame.init()
display_info = pygame.display.Info()
screen_width, screen_height = display_info.current_w,
display_info.current_h
screen = pygame.display.set_mode((0, 0), pygame.FULLSCREEN)
```

Inisialisasi color

```
bg_color = pygame.Color("#001219")
WHITE = pygame.Color("#fefae0")
YELLOW = pygame.Color("#ffba08")
RED = pygame.Color("#d00000")
GREEN = pygame.Color("#06d6a0")
```

Inisialisasi ukuran bola dan player

```
ball_radius = 15
player_width1, player_height1 = 15, 150
player_width2, player_height2 = 15, 150
```

Inisialisasi posisi bola dan player

```
ball = pygame.Rect(screen_width//2-ball_radius,
screen_height//2-ball_radius, ball_radius*2, ball_radius*2)
player1 = pygame.Rect(0, screen_height//2-player_height1//2,
player_width1, player_height1)
player2 = pygame.Rect(screen_width-player_width2,
screen_height//2-player_height2//2, player_width2, player_height2)
```

Inisialisasi speed bola dan player

```
ball_speed_x, ball_speed_y = 5, 5
player_speed = 5
player1_delta, player2_delta = 0, 0
player1_score, player2_score = 0, 0
```

Inisialisasi waktu dan font

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

```
font = pygame.font.SysFont("inkfree", 35)
```

Inisialisasi sound effect

```
collides_sound = pygame.mixer.Sound(os.getcwd()+'/sounds/sound1.wav')
wrong_sound = pygame.mixer.Sound(os.getcwd()+'/sounds/wrong.wav')
winner_sound = pygame.mixer.Sound(os.getcwd()+'/sounds/winner.wav')
ball_sound = pygame.mixer.Sound(os.getcwd()+'/sounds/ball.wav')
Game_Music_sound =
pygame.mixer.Sound(os.getcwd()+'/sounds/Game_Music.mp3')
```

Inisialisasi waktu dan kondisi run

```
second = 60
running = True
```

Menjalankan program dan memberi kondisi adanya tombol keyboard yang bisa digunakan

```
while running:

   for event in pygame.event.get():
       if event.type == pygame.QUIT:
           pygame.quit()
           quit()
       if event.type == pygame.KEYDOWN:
           if event.key == pygame.K_s:
               player1_delta = player_speed
           if event.key == pygame.K_w:
               player1_delta = -player_speed
           if event.key == pygame.K_DOWN:
               player2_delta = player_speed
           if event.key == pygame.K_UP:
               player2_delta = -player_speed
       if event.type == pygame.KEYUP:
           if event.key == pygame.K_s or event.key == pygame.K_w:
               player1_delta = 0
           if event.key == pygame.K_DOWN or event.key == pygame.K_UP:
               player2_delta = 0
```

Memberi fungsi increment pergerakan player untuk setiap key yang di tekan menggunakan keyboard

```
   player1.y += player1_delta
   player2.y += player2_delta
```

```
    player1.top = max(0, player1.top)
    player2.top = max(0, player2.top)
    player1.bottom = min(screen_height, player1.bottom)
    player2.bottom = min(screen_height, player2.bottom)

    ball.x += ball_speed_x
    ball.y += ball_speed_y
```

Memberi kondisi pergerakan bola jika bola mengenai layar dan pergerakan jika bola mengenai player

```
    if ball.top <= 0 or ball.bottom >= screen_height:
        ball_speed_y *= -1
        pygame.mixer.Sound.play(ball_sound)
    if ball.left <= 0 or ball.right >= screen_width:
        ball_speed_x *= -1
        if ball.left <= 0:
            player2_score += 1
            pygame.mixer.Sound.play(wrong_sound)
        else:
            player1_score += 1
            pygame.mixer.Sound.play(wrong_sound)
```

Memberi kondisi pergerakan bola jika bola bertabrakan dengan player

```
    if ball.colliderect(player1) or ball.colliderect(player2):
        ball_speed_x *= -1
        pygame.mixer.Sound.play(collides_sound)
```

Membuat text untuk speed bola, dan score player

```
    screen.fill(bg_color)
    ball_speed_text = font.render('Ball Speed:
{}'.format(round(second)), True, WHITE)
    ball_speed_text_rect = ball_speed_text.get_rect()
    ball_speed_text_rect.center = (screen_width//2, 20)
    screen.blit(ball_speed_text, ball_speed_text_rect)

    player1_text = font.render('Player 1: {}'.format(player1_score),
True, WHITE)
    player1_text_rect = player1_text.get_rect()
    player1_text_rect.center = (screen_width//4, 20)
    screen.blit(player1_text, player1_text_rect)
```

```
   player2_text = font.render('Player 2: {}'.format(player2_score),
True, WHITE)
   player2_text_rect = player2_text.get_rect()
   player2_text_rect.center = (screen_width-screen_width//4, 20)
   screen.blit(player2_text, player2_text_rect)

   pygame.draw.aaline(screen, WHITE, (screen_width//2, 0),
(screen_width//2, screen_height))
   gfxdraw.aacircle(screen, screen_width//2, screen_height//2, 200,
WHITE)
   pygame.draw.rect(screen, YELLOW, player1)
   pygame.draw.rect(screen, RED, player2)
   gfxdraw.filled_circle(screen, ball.centerx, ball.centery,
ball_radius, WHITE)
```

Menggambar lapangan, bola, dan player

```
   pygame.draw.aaline(screen, WHITE, (screen_width//2, 0),
(screen_width//2, screen_height))
   gfxdraw.aacircle(screen, screen_width//2, screen_height//2, 200,
WHITE)
   pygame.draw.rect(screen, YELLOW, player1)
   pygame.draw.rect(screen, RED, player2)
   gfxdraw.filled_circle(screen, ball.centerx, ball.centery,
ball_radius, WHITE)
```

Memberi kondisi untuk player yang menang, fungsi play again, serta fungsi increment speed bola

```
   game_over = False

   if player1_score == 3 or player2_score == 3:
       pygame.mixer.Sound.play(winner_sound)
       game_over = True

       ball.center = (screen_width//2, screen_height//2)
       ball_speed_x *= random.choice([-1, 1])
       ball_speed_y *= random.choice([-1, 1])
       ball_speed_x, ball_speed_y = 0, 0

       if player1_score > player2_score:
           winner_text = font.render('The Winner is Player 1', True,
GREEN)
           winner_text_rect = winner_text.get_rect()
           winner_text_rect.center = (screen_width-screen_width//2,
150)
```

```
            screen.blit(winner_text, winner_text_rect)
        elif player1_score < player2_score:
            winner_text = font.render('The Winner is Player 2', True,
GREEN)
            winner_text_rect = winner_text.get_rect()
            winner_text_rect.center = (screen_width-screen_width//2,
150)
            screen.blit(winner_text, winner_text_rect)

        play_again_text = font.render('Play Again? Enter (y/n)', True,
WHITE)
        play_again_text_rect = play_again_text.get_rect()
        play_again_text_rect.center = (screen_width-screen_width//2,
200)
        screen.blit(play_again_text, play_again_text_rect)

        for event in pygame.event.get():

            if event.type == pygame.QUIT:
                game_over = False
                running = False

            # get the user's input (y or n)
            if event.type == pygame.KEYDOWN:
                if event.key == pygame.K_y:
                    # reset the ga
                    gameover = False

                    player1_score = 0
                    player2_score = 0

                    second = 60
                    ball_speed_x, ball_speed_y = 5, 5


                elif event.key == pygame.K_n:
                    # exit the loops
                    gameover = False
                    running = False

        pygame.display.update()
        clock.tick(second)

    else:

        pygame.display.update()
        clock.tick(second)
        second += 0.02
```

Tools

- Python 3.10
- Visual Studio Code

Source Code

```
import pygame
from pygame import gfxdraw
import random
import os

pygame.init()
display_info = pygame.display.Info()
screen_width, screen_height = display_info.current_w,
display_info.current_h
screen = pygame.display.set_mode((0, 0), pygame.FULLSCREEN)

bg_color = pygame.Color("#001219")
WHITE = pygame.Color("#fefae0")
YELLOW = pygame.Color("#ffba08")
RED = pygame.Color("#d00000")
GREEN = pygame.Color("#06d6a0")

ball_radius = 15
player_width1, player_height1 = 15, 150
player_width2, player_height2 = 15, 150

ball = pygame.Rect(screen_width//2-ball_radius,
screen_height//2-ball_radius, ball_radius*2, ball_radius*2)
player1 = pygame.Rect(0, screen_height//2-player_height1//2,
player_width1, player_height1)
player2 = pygame.Rect(screen_width-player_width2,
screen_height//2-player_height2//2, player_width2, player_height2)

ball_speed_x, ball_speed_y = 5, 5
player_speed = 5
player1_delta, player2_delta = 0, 0
player1_score, player2_score = 0, 0

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

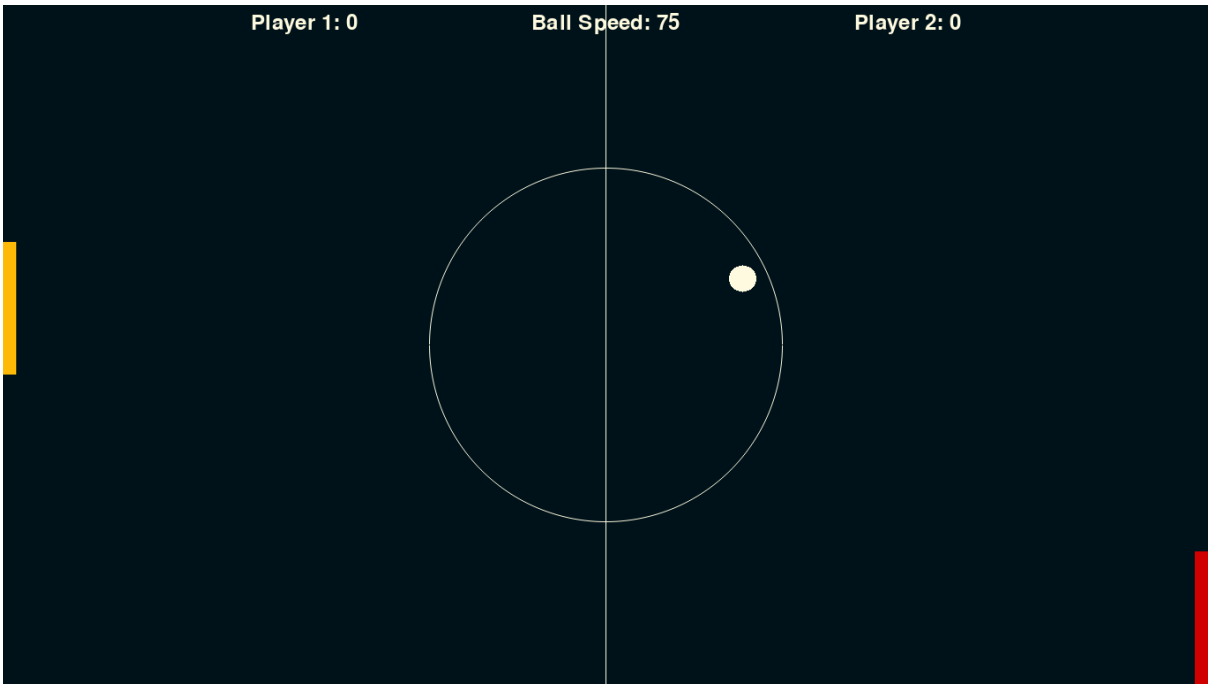
```
font = pygame.font.SysFont("inkfree", 35)

collides_sound = pygame.mixer.Sound(os.getcwd()+'/sounds/sound1.wav')
wrong_sound = pygame.mixer.Sound(os.getcwd()+'/sounds/wrong.wav')
winner_sound = pygame.mixer.Sound(os.getcwd()+'/sounds/winner.wav')
ball_sound = pygame.mixer.Sound(os.getcwd()+'/sounds/ball.wav')
Game_Music_sound =
pygame.mixer.Sound(os.getcwd()+'/sounds/Game_Music.mp3')

second = 60
running = True
while running:

    for event in pygame.event.get():
        if event.type == pygame.QUIT:
            pygame.quit()
            quit()
        if event.type == pygame.KEYDOWN:
            if event.key == pygame.K_s:
                player1_delta = player_speed
            if event.key == pygame.K_w:
                player1_delta = -player_speed
            if event.key == pygame.K_DOWN:
                player2_delta = player_speed
            if event.key == pygame.K_UP:
                player2_delta = -player_speed
        if event.type == pygame.KEYUP:
            if event.key == pygame.K_s or event.key == pygame.K_w:
                player1_delta = 0
            if event.key == pygame.K_DOWN or event.key == pygame.K_UP:
                player2_delta = 0

    player1.y += player1_delta
    player2.y += player2_delta
    player1.top = max(0, player1.top)
    player2.top = max(0, player2.top)
    player1.bottom = min(screen_height, player1.bottom)
    player2.bottom = min(screen_height, player2.bottom)

    ball.x += ball_speed_x
    ball.y += ball_speed_y

    if ball.top <= 0 or ball.bottom >= screen_height:
        ball_speed_y *= -1
        pygame.mixer.Sound.play(ball_sound)
    if ball.left <= 0 or ball.right >= screen_width:
        ball_speed_x *= -1
        if ball.left <= 0:
```

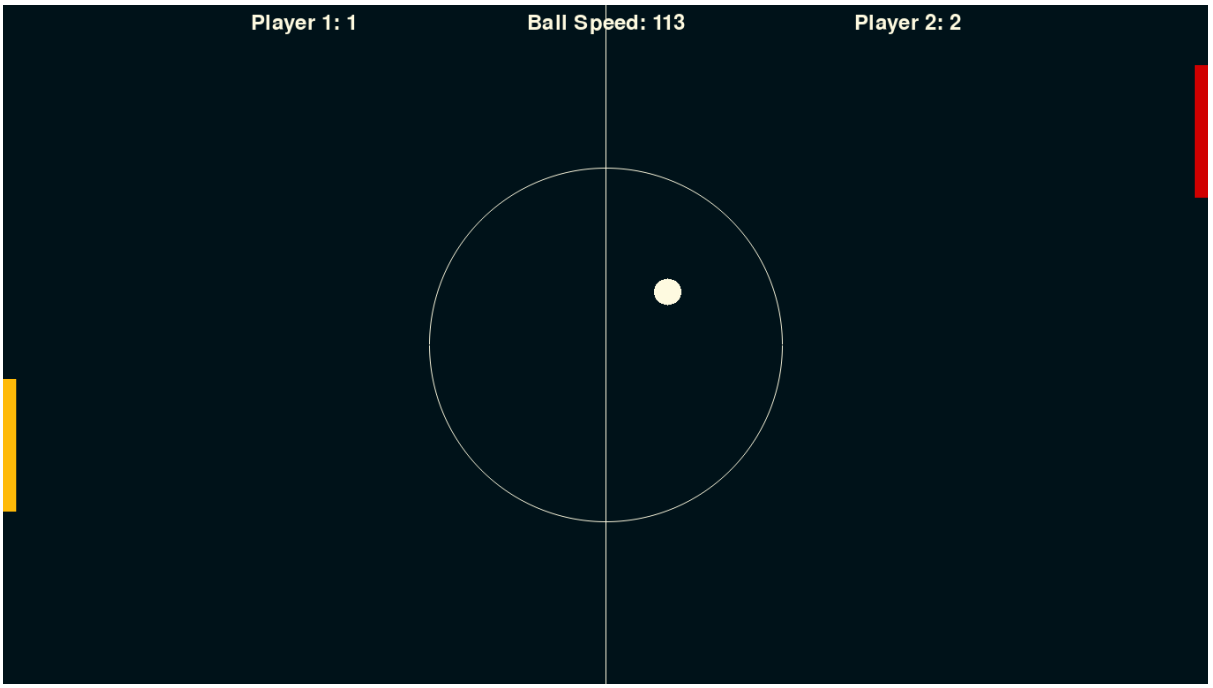
```
            player2_score += 1
            pygame.mixer.Sound.play(wrong_sound)
        else:
            player1_score += 1
            pygame.mixer.Sound.play(wrong_sound)

    if ball.colliderect(player1) or ball.colliderect(player2):
        ball_speed_x *= -1
        pygame.mixer.Sound.play(collides_sound)

    screen.fill(bg_color)
    ball_speed_text = font.render('Ball Speed: {}'.format(round(second)),
True, WHITE)
    ball_speed_text_rect = ball_speed_text.get_rect()
    ball_speed_text_rect.center = (screen_width//2, 20)
    screen.blit(ball_speed_text, ball_speed_text_rect)

    player1_text = font.render('Player 1: {}'.format(player1_score),
True, WHITE)
    player1_text_rect = player1_text.get_rect()
    player1_text_rect.center = (screen_width//4, 20)
    screen.blit(player1_text, player1_text_rect)

    player2_text = font.render('Player 2: {}'.format(player2_score),
True, WHITE)
    player2_text_rect = player2_text.get_rect()
    player2_text_rect.center = (screen_width-screen_width//4, 20)
    screen.blit(player2_text, player2_text_rect)

    pygame.draw.aaline(screen, WHITE, (screen_width//2, 0),
(screen_width//2, screen_height))
    gfxdraw.aacircle(screen, screen_width//2, screen_height//2, 200,
WHITE)
    pygame.draw.rect(screen, YELLOW, player1)
    pygame.draw.rect(screen, RED, player2)
    gfxdraw.filled_circle(screen, ball.centerx, ball.centery,
ball_radius, WHITE)

    game_over = False

    if player1_score == 3 or player2_score == 3:
        pygame.mixer.Sound.play(winner_sound)
        game_over = True

        ball.center = (screen_width//2, screen_height//2)
        ball_speed_x *= random.choice([-1, 1])
        ball_speed_y *= random.choice([-1, 1])
        ball_speed_x, ball_speed_y = 0, 0
```

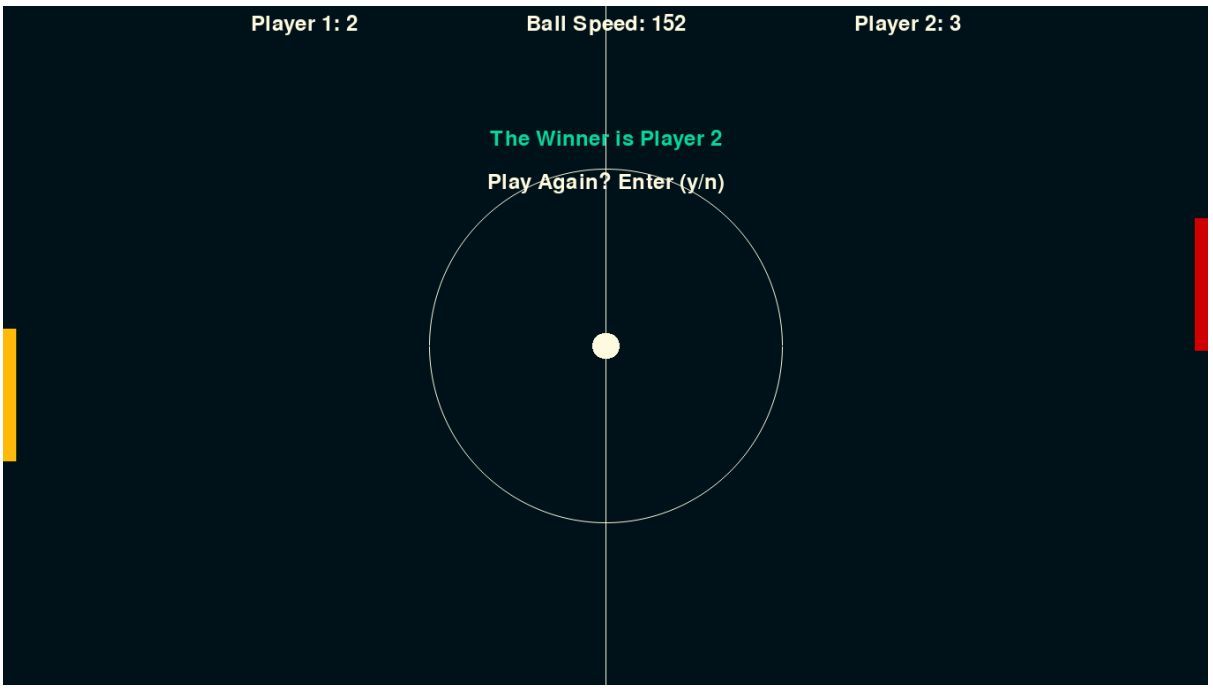
```
        if player1_score > player2_score:
            winner_text = font.render('The Winner is Player 1', True,
GREEN)
            winner_text_rect = winner_text.get_rect()
            winner_text_rect.center = (screen_width-screen_width//2, 150)
            screen.blit(winner_text, winner_text_rect)
        elif player1_score < player2_score:
            winner_text = font.render('The Winner is Player 2', True,
GREEN)
            winner_text_rect = winner_text.get_rect()
            winner_text_rect.center = (screen_width-screen_width//2, 150)
            screen.blit(winner_text, winner_text_rect)

        play_again_text = font.render('Play Again? Enter (y/n)', True,
WHITE)
        play_again_text_rect = play_again_text.get_rect()
        play_again_text_rect.center = (screen_width-screen_width//2, 200)
        screen.blit(play_again_text, play_again_text_rect)

        for event in pygame.event.get():

            if event.type == pygame.QUIT:
                game_over = False
                running = False

            # get the user's input (y or n)
            if event.type == pygame.KEYDOWN:
                if event.key == pygame.K_y:
                    # reset the ga
                    gameover = False

                    player1_score = 0
                    player2_score = 0

                    second = 60
                    ball_speed_x, ball_speed_y = 5, 5


                elif event.key == pygame.K_n:
                    # exit the loops
                    gameover = False
                    running = False

        pygame.display.update()
        clock.tick(second)

    else:
```

```
        pygame.display.update()
        clock.tick(second)
        second += 0.02
```

Result







Referensi

https://github.com/bapiraj/pong-game