**LAPORAN PRAKTIKUM**

**PRAKTIK GAME DEVELOPMENT**

**“MEMBUAT PONG GAME”**



Disusun oleh :

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**TUGAS INDIVIDU**

1. Cobalah program pada poin C. Kode program pada poin C terdiri dari beberapa Part. Susun bagian-bagian kode tersebut sehingga dapat menjadi satu kesatuan program utuh !

Jawab :

**import pygame, sys, random**

**class Block(pygame.sprite.Sprite):**

**def \_\_init\_\_(self,path,x\_pos,y\_pos):**

**super().\_\_init\_\_()**

**self.image = pygame.image.load(path)**

**self.rect = self.image.get\_rect(center = (x\_pos,y\_pos))**

**class Player(Block):**

**def \_\_init\_\_(self,path,x\_pos,y\_pos,speed):**

**super().\_\_init\_\_(path,x\_pos,y\_pos)**

**self.speed = speed**

**self.movement = 0**

**def screen\_constrain(self):**

**if self.rect.top <= 0:**

**self.rect.top = 0**

**if self.rect.bottom >= screen\_height:**

**self.rect.bottom = screen\_height**

**def update(self,ball\_group):**

**self.rect.y += self.movement**

**self.screen\_constrain()**

**class Ball(Block):**

**def \_\_init\_\_(self,path,x\_pos,y\_pos,speed\_x,speed\_y,paddles):**

**super().\_\_init\_\_(path,x\_pos,y\_pos)**

**self.speed\_x = speed\_x \* random.choice((-1,1))**

**self.speed\_y = speed\_y \* random.choice((-1,1))**

**self.paddles = paddles**

**self.active = False**

**self.score\_time = 0**

**def update(self):**

**if self.active:**

**self.rect.x += self.speed\_x**

**self.rect.y += self.speed\_y**

**self.collisions()**

**else:**

**self.restart\_counter()**

**def collisions(self):**

**if self.rect.top <= 0 or self.rect.bottom >= screen\_height:**

**pygame.mixer.Sound.play(plob\_sound)**

**self.speed\_y \*= -1**

**if pygame.sprite.spritecollide(self,self.paddles,False):**

**pygame.mixer.Sound.play(plob\_sound)**

**collision\_paddle = pygame.sprite.spritecollide(self,self.paddles,False)[0].rect**

**if abs(self.rect.right - collision\_paddle.left) < 10 and self.speed\_x > 0:**

**self.speed\_x \*= -1**

**if abs(self.rect.left - collision\_paddle.right) < 10 and self.speed\_x < 0:**

**self.speed\_x \*= -1**

**if abs(self.rect.top - collision\_paddle.bottom) < 10 and self.speed\_y < 0:**

**self.rect.top = collision\_paddle.bottom**

**self.speed\_y \*= -1**

**if abs(self.rect.bottom - collision\_paddle.top) < 10 and self.speed\_y > 0:**

**self.rect.bottom = collision\_paddle.top**

**def reset\_ball(self):**

**self.active = False**

**self.speed\_x \*= random.choice((-1,1))**

**self.speed\_y \*= random.choice((-1,1))**

**self.score\_time = pygame.time.get\_ticks()**

**self.rect.center = (screen\_width/2,screen\_height/2)**

**pygame.mixer.Sound.play(score\_sound)**

**def restart\_counter(self):**

**current\_time = pygame.time.get\_ticks()**

**countdown\_number = 3**

**if current\_time - self.score\_time <= 700:**

**countdown\_number = 3**

**if 700 < current\_time - self.score\_time <= 1400:**

**countdown\_number = 2**

**if 1400 < current\_time - self.score\_time <= 2100:**

**countdown\_number = 1**

**if current\_time - self.score\_time >= 2100:**

**self.active = True**

**time\_counter = basic\_font.render(str(countdown\_number),True,accent\_color)**

**time\_counter\_rect = time\_counter.get\_rect(center = (screen\_width/2,screen\_height/2 + 50))**

**pygame.draw.rect(screen,bg\_color,time\_counter\_rect)**

**class Opponent(Block):**

**def \_\_init\_\_(self,path,x\_pos,y\_pos,speed):**

**super().\_\_init\_\_(path,x\_pos,y\_pos)**

**self.speed = speed**

**def update(self,ball\_group):**

**if self.rect.top < ball\_group.sprite.rect.y:**

**self.rect.y += self.speed**

**if self.rect.bottom > ball\_group.sprite.rect.y:**

**self.rect.y -= self.speed**

**self.constrain()**

**def constrain(self):**

**if self.rect.top <= 0: self.rect.top = 0**

**if self.rect.bottom >= screen\_height: self.rect.bottom = screen\_height**

**class GameManager:**

**def \_\_init\_\_(self,ball\_group,paddle\_group):**

**self.player\_score = 0**

**self.opponent\_score = 0**

**self.ball\_group = ball\_group**

**self.paddle\_group = paddle\_group**

**def run\_game(self):**

**# Drawing the game objects**

**self.paddle\_group.draw(screen)**

**self.ball\_group.draw(screen)**

**# Updating the game objects**

**self.paddle\_group.update(self.ball\_group)**

**self.ball\_group.update()**

**self.reset\_ball()**

**self.draw\_score()**

**def reset\_ball(self):**

**if self.ball\_group.sprite.rect.right >= screen\_width:**

**self.opponent\_score += 1**

**self.ball\_group.sprite.reset\_ball()**

**if self.ball\_group.sprite.rect.left <= 0:**

**self.player\_score += 1**

**self.ball\_group.sprite.reset\_ball()**

**def draw\_score(self):**

**player\_score = basic\_font.render(str(self.player\_score),True,accent\_color)**

**opponent\_score = basic\_font.render(str(self.opponent\_score),True,accent\_color)**

**player\_score\_rect = player\_score.get\_rect(midleft = (screen\_width / 2 + 40,screen\_height/2))**

**opponent\_score\_rect = opponent\_score.get\_rect(midright = (screen\_width / 2 - 40,screen\_height/2))**

**screen.blit(player\_score,player\_score\_rect)**

**screen.blit(opponent\_score,opponent\_score\_rect)**

**# pengaturan umum**

**pygame.mixer.pre\_init(44100,-16,2,512)**

**pygame.init()**

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

**# Mengatur Besar Layar**

**screen\_width = 720**

**screen\_height = 480**

**screen = pygame.display.set\_mode((screen\_width,screen\_height))**

**pygame.display.set\_caption('Pong')**

**# Mengatur Tampilan dan suara Game**

**bg\_color = pygame.Color('#2F373F')**

**accent\_color = (27,35,43)**

**basic\_font = pygame.font.Font('freesansbold.ttf', 32)**

**plob\_sound = pygame.mixer.Sound("pong.ogg")**

**score\_sound = pygame.mixer.Sound("score.ogg")**

**middle\_strip = pygame.Rect(screen\_width/2 - 2,0,4,screen\_height)**

**# Objek Game**

**player = Player('Paddle.png',screen\_width - 20,screen\_height/2,5)**

**opponent = Opponent('Paddle.png',20,screen\_width/2,5)**

**paddle\_group = pygame.sprite.Group()**

**paddle\_group.add(player)**

**paddle\_group.add(opponent)**

**ball = Ball('Ball.png',screen\_width/2,screen\_height/2,4,4,paddle\_group)**

**ball\_sprite = pygame.sprite.GroupSingle()**

**ball\_sprite.add(ball)**

**game\_manager = GameManager(ball\_sprite,paddle\_group)**

**while True:**

**for event in pygame.event.get():**

**if event.type == pygame.QUIT:**

**pygame.quit()**

**sys.exit()**

**if event.type == pygame.KEYDOWN:**

**if event.key == pygame.K\_UP:**

**player.movement -= player.speed**

**if event.key == pygame.K\_DOWN:**

**player.movement += player.speed**

**if event.type == pygame.KEYUP:**

**if event.key == pygame.K\_UP:**

**player.movement += player.speed**

**if event.key == pygame.K\_DOWN:**

**player.movement -= player.speed**

**# Latar Belakang**

**screen.fill(bg\_color)**

**pygame.draw.rect(screen,accent\_color,middle\_strip)**

**# Untuk menjalankan game**

**game\_manager.run\_game()**

**# Rendering Game**

**pygame.display.flip()**

**clock.tick(120)**

1. Langkah selanjutnya adalah, identifikasi pada bagian manakah implementasi AI pada program game tersebut. Jelaskan !

Jawab :

Di Code part I line 85-99, terdapat Ai dikarenakan pada bagian ini memungkinkan untuk Stopper sebelah kiri untuk bergerak otomatis sesuai dengan codenya . oleh karena itu stopper tersebut dapat bergerak ke atas dan kebawah mengikuti gerak arahnya bola dan dapat pula menambah kecepatannya.

1. Jelaskan bagaimana alur AI yang digunakan pada program tersebut !

Jawab :

Bola berada di tengah window kemudian jika hitungan waktu mundur sudah dimulai maka bola akan bergerak secara acak keatas bawah kanan dan kiri layar, stopper sebelah kanan akan dapat digerakkan oleh player/pemain sedangkan stopper sebelah kiri akan mengikuti pergerakan bola apakah berada di posisi atas atau bawah.

Ketika game dimulai bolanya akan bergerak sesuai dengan arah pantulan yang dihasilkan dari stopper , lalu jika bola melewati sisi stopper maka score akan bertambah untuk pihak pemantul bola tersebut. Jadi, bisa dibilang ini adalah 2 player dimana 1 player asli yaitu kita sendiri dan 1 player adalah buatan dari AI.