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**KELAS : D3 TI E PSDKU**

**MATKUL : PRAKTIK GAME DEVELOPMENT**

**Tugas 5**

**D. 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 !**

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

self.speed\_y \*= -1

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)

screen.blit(time\_counter,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):

self.paddle\_group.draw(screen)

self.ball\_group.draw(screen)

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)

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

pygame.init()

clock = pygame.time.Clock()

screen\_width = 720

screen\_height = 480

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

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

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)

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

screen.fill(bg\_color)

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

game\_manager.run\_game()

pygame.display.flip()

clock.tick(120)

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

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

Pada program di atas adalah implementasi AI karena pada bagian ini memungkinkan untuk paddle sebelah kiri untuk bergerak secara otomatis . dengan bergerak ke atas dan kebawah mengikuti gerak arahnya bola.

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

Ball akan memantul dan bergerak ke arah padle yang dikendalikan keyboard dan pemain,padle sebelah kiri dikendalikan secara otomatis dan sebelah kanan dikendalikan melalui keybord pemain, Pemain dan komputer akan mendapat score bila berhasil memasukan bola kedalam gawang lawan atau ball tidak berhasil di tangkis