Praktikum Game Developmet

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1. Susunan kode

#PART A

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))

# PART E

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()

# PART C

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()

# PART G

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) # mengatur suara jika bola bertabrakan dengan paddle

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

# PART B

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)

# PART M

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)

# PART I

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

# PART H

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)

# memperbarui objek game

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

self.ball\_group.update()

self.reset\_ball()

self.draw\_score()

# PART J

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)

# PART D

# General setup

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

pygame.init()

clock = pygame.time.Clock()

# Main Window

screen\_width = 720

screen\_height = 480

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

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

# Global Variables

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)

# PART F

player = Player('Paddle.png',screen\_width - 20,screen\_height/2,5)#ukuran paddle(papan dayung) player

opponent = Opponent('Paddle.png',20,screen\_width/2,5)#ukuran paddle(papan dayung) lawan

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)# ukuran bola pong

ball\_sprite = pygame.sprite.GroupSingle()

ball\_sprite.add(ball)

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

# PART L

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

# PART K

screen.fill(bg\_color)

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

game\_manager.run\_game()

pygame.display.flip()

clock.tick(120)

1. Implementasi AI dalam game Pong

Pada game pong ini merupakan implemenasi keceerdasan buatan yang menjadikan computer sebagai lawan main dalam game ini.

1. Alur AI yang digunakan program

Dalam game ini pemain ditugaskan menghalau bola dengan paddle/papan untuk mendapatkan skor, apabila bola dapat dihalau dan lawan tidak bisa menghalau/melempar balik artinya pemain mendapatkan skor 2. Namun jika pemain tidak dapat menghalau bola dari lawan yang berarti bola out maka lawan akan mendapat skor 1. Skor akan ditampilkan otomatis pada tengah lapangan. Permainan akan dimulai kembali 3 detik setelah bola out.