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Assignment Cover Letter

(Individual Work)

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Course Code	**: COMP6502**	**Course Name**	**: Introduction to Programming**
Class	**: L1AC**	**Name of Lecturer(s)**	**:** 1. Bagus Kerthyayana 2. Tri Asih Budiono
Major	**: CS**		
Title of Assignment (if any)	: **Maze Simulator(Game)**		
Type of Assignment	**: Final Project**		
Submission Pattern			
Due Date	**: 6-11-2017**	**Submission Date**	**: 6-11-2017**

The assignment should meet the below requirements.

1. Assignment (hard copy) is required to be submitted on clean paper, and (soft copy) as per lecturer's instructions.
2. Soft copy assignment also requires the signed (hardcopy) submission of this form, which automatically validates the softcopy submission.
3. The above information is complete and legible.
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Signature of Student:

(Name of Student)
Guntur Sandjaya

“Maze Simulator”

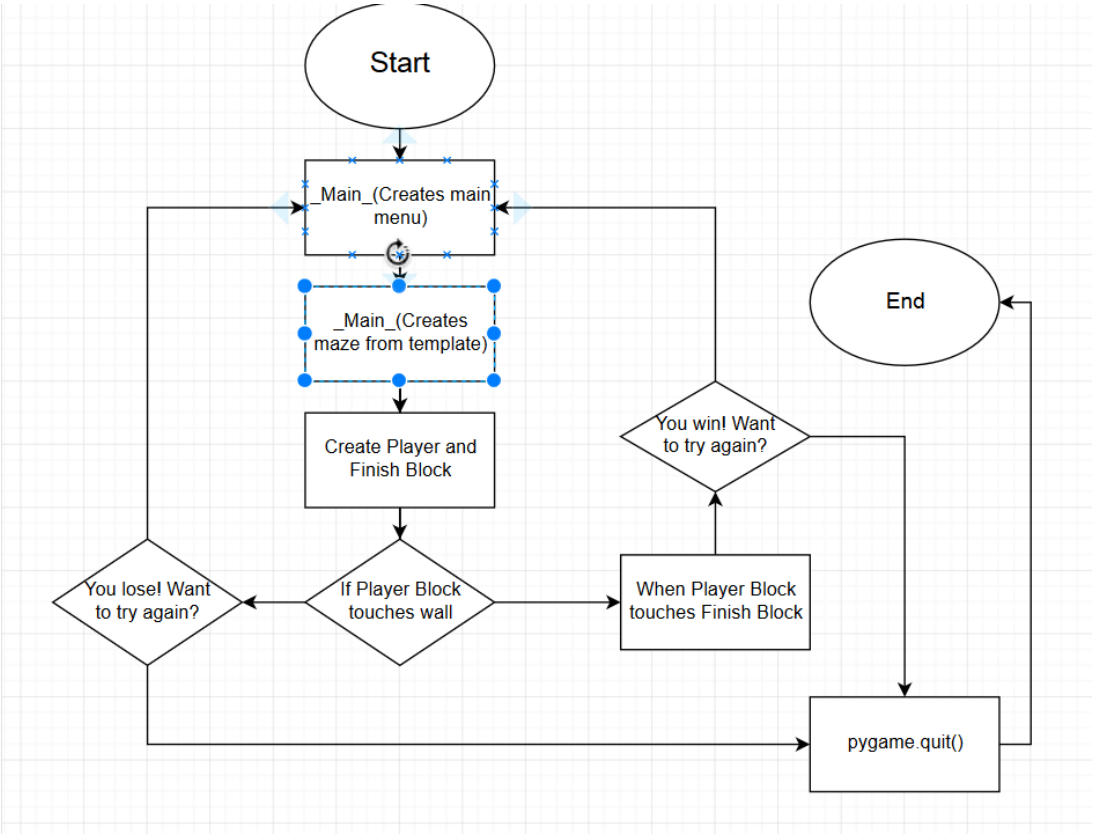
Name: Adrian Pratama Suharto

ID : 2101720682

I. Description

This program is a project that is made to help anyone to learn more about python, to have fun and start being interested in the world of programming. The reason this program was made is because it allows future programmers to think of several ways to make a solution or to create creative ideas that will help to make much more innovative programs, that hopefully can solve our problems that will arise in the future.

II. Flow Chart



III. Explanation of the Function

Class Box():

Class Box initiates the Box class that the player will use to play the program. The program itself will load an image called RedBox.png that will be used by the player, and it will make it into a hitbox by using the get_rect() method. It will first be declared at the empty space at the top left of the maze, where it will be crushed to pieces if it hits the wall. The class also declares the position of the player block so it can move anywhere it pleases, as long it doesn't touch the walls.

Class Maze():

Class Maze initiates the width and the height of the blocks that will be used to fill up the screen. It will split the 950 x 650 sized screen into a 19 x 13 space that will be filled by blocks with 50 x 50 size that are declared by the MazeWall class. The template that the class will use are declared by another module called template, where it uses def receive() that will declared a list of game templates that are available. Once declared the function game() will make an object out of a maze with the parameter that the def receive() has declared.

Class MazeWall():

Declares blocks and inputs the YellowBox.png that will be used by Maze function to create walls for the program. It also makes the hitbox for the maze by using get_rect()

Class Finish():

Declares and load the image for the block that the player block must reach to win the game. The block appears either in three random locations, at the top right, bottom left, or bottom right of the maze.

Main function:

Holds the pygame.init() function that initializes pygame, display.set_mode that initializes the windows, and declares Black and White RGB color.

def menu():

Creates caption for the window, also starts the first interface that will appear when you first start the program. The sentence will appear at the middle of the screen.

def tryagain()/lose():

The tryagain function are executed when the player block collides with the finish block, while the lose function are executed when the player block collides with the wall block. Both functions opens up a new window that declares whether you win or lose the game. If you lose the game, the player block dies horribly with a horrible scream.

game():

Loads the sound of the game, creates a loop that allows continual movement of the player block, randomize the template that will be chosen by the maze, and creates the object of the classes. Also creates the maze by calling the object that initialized the MazeClass. It also generates grouping of the sprites that comes from the objects. After all parts of the program are declared, assigned, and called, the program will update the display. If the player block touches either the finish block or the wall block, the program will go to lose/tryagain function.

template.py:

holds the def receive() that lists all available template for the maze program to use.

IV. Source Code:

Maze.py:

```
import random
from pygame import *
from pygame.sprite import *
from template import receive
#import modules
#create Box Class for the Box player
class Box(Sprite):
    def __init__(self):#initialize the sprite
        Sprite.__init__(self)
        self.image= pygame.image.load("RedBox.png")#load the image
        self.rect = self.image.get_rect()#creates hitbox
        self.rect.left = self.rect.top = 60#initial position
    def moveRight(self):#move the box to the right
        self.rect.left += 2
    def moveLeft(self):#move the box to the left
        self.rect.left -= 2
    def moveUp(self):#move the box forward
        self.rect.top -= 2
    def moveDown(self):#move the box backward
        self.rect.top += 2

class Maze(Sprite):#makes the maze
    def __init__(self,grid):
        #initializes class as well as asking for input from the template.py
        Sprite.__init__(self)
        self.M = 19 #amount of the blocks at the row
        self.N = 13 #amount of the blocks at the column
        self.maze = grid #accepts parameter
    def create(self,surface,image): #creates the wall
        self.mazewall = Group()#groups the wall
        bx = 0#x axis of the blocks
        by = 0#y axis of the blocks
```

```
        for i in range(0,self.M*self.N):#ranges the amount of blocks need to be declared
            if self.maze[bx + (by*self.M)]== 1:#
                tempwall = MazeWall(bx*50,by*50)
                self.mazewall.add(tempwall)#adds wall for every row

            bx = bx+1
            if bx > self.M-1:#resets the x axis blocks to 0
                bx = 0
                by = by+1#goes to the next colum
        return self.mazewall

class Finish(Sprite):#creates the finish class
    def __init__(self):
        Sprite.__init__(self)
        self.image = pygame.image.load("FinishBox.png").convert()#loads the class image
        self.rect = self.image.get_rect()#creates hitbox
        x = (850,550)
        y = (850,50)
        z = (50,550)
        rand = [x,y,z]#list of available position
        (self.rect.left,self.rect.top) = rand[random.randint(0,2)]#randomize the position

class MazeWall(Sprite):#class for the maze blocks
    def __init__(self,x,y):
        Sprite.__init__(self)
        self.image= pygame.image.load("YellowBox.png").convert()#load the image
        self.rect = self.image.get_rect()#creates hitbox
        self.rect.top = y
        self.rect.left = x

def text_object(text, font):#renders the font
    textSurface = font.render(text, True, (BLACK))
    return textSurface, textSurface.get_rect()

#main function
pygame.init()#initialize everything
display_width = 950
display_height = 650
display = pygame.display.set_mode((display_width,display_height),HWSURFACE,0)#initialize the
window
BLACK = (0,0,0)#values for RGB
WHITE = (255,255,255)

def menu():#function for menu
    pygame.display.set_caption("Welcome to a-MAZE-ing World")#caption for the window
    apple = True
    while apple:
        largeText = pygame.font.Font(None, 80)#declares the font template
        textSurf, textRect = text_object("PRESS SPACE TO START", largeText)#asks for input
```

```
        textRect.center = ((display_width/2), (display_height/2))
        display.fill((WHITE))#refill the background with white
        display.blit(textSurf, textRect)#blits the window
        for events in pygame.event.get():
            keys = key.get_pressed()#gets the keys to check for input
            if events.type == pygame.QUIT:
                pygame.quit()
            if keys[K_SPACE]:
                apple = False
        pygame.display.flip()

def tryagain():#function for trying the game again
    apple = True
    while apple:
        largeText = pygame.font.Font(None, 60)
        textSurf, textRect = text_object("You win! Do you want to Continue?", largeText)
        textRect.center = ((display_width/2), (display_height/2))
        display.fill((WHITE))
        display.blit(textSurf, textRect)
        for events in pygame.event.get():
            keys = key.get_pressed()
            if keys[K_q]:#pressing q quits the game
                pygame,quit()
                quit()
            if keys[K_c]:#pressing c starts another game
                game()
            if events.type == pygame.QUIT:#pressing quit leaves the game
                pygame.quit()
        pygame.display.flip()

def lose():#function for trying the game
    apple = True
    pygame.mixer.music.load("glass.wav")#loads the sound of losing
    pygame.mixer.music.play()#plays it
    while apple:
        largeText = pygame.font.Font(None, 60)
        textSurf, textRect = text_object("You lose! Do you want to Continue?", largeText)
        textRect.center = ((display_width/2), (display_height/2))
        display.fill((WHITE))
        display.blit(textSurf, textRect)
        for events in pygame.event.get():
            keys = key.get_pressed()
            if keys[K_q]:
                pygame,quit()
                quit()
            if keys[K_c]:
                game()
            if events.type == pygame.QUIT:
                pygame.quit()
```

```
        pygame.display.flip()

def game():#starting the game function
    pygame.mixer.music.load("Solution.wav")#loads the music for the game
    pygame.mixer.music.play(-1)#loops the game sound
    pygame.mixer.music.set_volume(1)#sets the volume
    running = True
    x = random.randint(0,4)#randomized number between 0-4
    y = receive()#receive the list
    z = y[x]#getting value of the randomized number and use it to get the list's value
    player = Box()#initialize box class
    maze = Maze(z)#initialize maze class using the template
    finish = Finish()#initialize finish class
    mazewallgroup = maze.create(display,image)#create maze
    sprites = Group(player)#grouping the sprite
    sprite = Group(finish)#grouping the sprite

    while running:
        keys = pygame.key.get_pressed()
        if keys[K_RIGHT]:
            player.moveRight()
            if spritecollideany(player,mazewallgroup):
                lose()
        if keys[K_LEFT]:
            player.moveLeft()
            if spritecollideany(player,mazewallgroup):
                lose()
        if keys[K_UP]:
            player.moveUp()
            if spritecollideany(player,mazewallgroup):
                lose()
        if keys[K_DOWN]:
            player.moveDown()
            if spritecollideany(player,mazewallgroup):
                lose()
        if keys[K_ESCAPE]:
            running = False
        if spritecollideany(player,sprite):
            tryagain()
        for event in pygame.event.get():
            if event == pygame.QUIT:
                pygame.quit()
        pygame.event.pump()#get event
        display.fill(BLACK)
        sprites.draw(display)#display everything
        sprite.draw(display)
        mazewallgroup.draw(display)
        pygame.display.flip()
```

```
menu()
game()
```

template.py:

```
def receive():
    a= [1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
        1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1,
        1, 1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 1, 0, 1,
        1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1,
        1, 0, 1, 0, 0, 0, 1, 0, 1, 0, 1, 1, 1, 0, 1, 0, 1, 0, 1,
        1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1,
        1, 0, 1, 1, 1, 1, 1, 0, 1, 0, 1, 1, 1, 1, 1, 1, 1, 0, 1,
        1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1,
        1, 0, 1, 0, 1, 1, 1, 1, 1, 0, 1, 0, 1, 0, 1, 1, 1, 0, 1,
        1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1,
        1, 0, 1, 1, 0, 1, 1, 0, 1, 1, 0, 1, 1, 0, 1, 0, 1, 0, 1,
        1, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 1,
        1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1]

    b =[1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
        1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1,
        1, 1, 1, 0, 1, 1, 1, 1, 1, 0, 1, 0, 1, 1, 1, 0, 1, 1, 1,
        1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1,
        1, 1, 1, 0, 1, 0, 0, 0, 1, 1, 1, 0, 1, 0, 1, 0, 1, 0, 1,
        1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1,
        1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 1, 1, 1, 1, 0, 1,
        1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1,
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        1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1,
        1, 1, 1, 0, 1, 1, 1, 1, 1, 1, 0, 1, 1, 1, 1, 1, 1, 0, 1,
        1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1,
        1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1]

    c =[1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
        1, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1,
        1, 0, 1, 0, 1, 0, 1, 0, 1, 1, 1, 1, 1, 0, 1, 0, 1, 0, 1,
        1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1,
        1, 1, 1, 1, 1, 1, 1, 0, 1, 1, 1, 0, 1, 1, 1, 1, 1, 0, 1,
        1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1,
        1, 1, 1, 0, 1, 1, 1, 1, 1, 0, 1, 1, 1, 0, 1, 0, 1, 0, 1,
        1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1,
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        1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1,
        1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1]

    d =[1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
```

```
        1,0,0,0,0,0,1,0,0,0,0,0,1,0,0,0,0,0,1,
        1,0,1,1,1,0,1,1,1,1,1,0,1,1,1,0,1,1,1,
        1,0,1,0,1,0,1,0,0,0,1,0,0,0,0,0,0,0,1,
        1,0,1,0,1,0,1,0,1,1,1,0,1,1,1,1,1,0,1,
        1,0,0,0,1,0,0,0,1,0,0,0,0,0,0,0,1,0,1,
        1,1,1,0,1,0,1,1,1,0,1,1,1,1,0,1,1,1,1,
        1,0,0,0,1,0,0,0,0,0,0,0,1,0,0,0,0,0,1,
        1,1,1,0,1,1,1,0,1,1,1,0,1,1,1,1,1,0,1,
        1,0,0,0,0,0,1,0,1,0,0,0,0,0,0,0,1,0,1,
        1,1,1,1,1,1,1,0,1,0,1,0,1,1,1,0,1,1,1,
        1,0,0,0,0,0,0,0,1,0,1,0,0,0,1,0,0,0,1,
        1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1]

    e =[1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,
        1,0,0,0,0,0,1,0,1,0,1,0,1,0,1,0,1,0,1,
        1,1,1,0,1,1,1,0,0,0,1,0,1,0,0,0,0,0,1,
        1,0,0,0,0,0,1,0,1,0,0,0,1,0,1,0,1,0,1,
        1,1,1,1,0,1,1,0,1,0,1,0,0,0,1,1,1,1,1,
        1,0,0,0,0,0,1,0,1,0,1,0,1,0,1,0,1,0,1,
        1,1,0,1,1,1,1,0,1,1,1,0,1,0,0,0,1,0,1,
        1,0,0,0,0,0,0,0,1,0,0,0,1,0,1,0,1,0,1,
        1,1,1,0,1,1,1,1,1,1,0,1,1,1,1,0,0,0,1,
        1,0,0,0,0,0,1,0,1,0,0,0,0,0,0,0,1,0,1,
        1,1,1,0,1,0,0,0,1,1,1,1,0,1,1,1,1,0,1,
        1,0,0,0,1,0,1,0,1,0,0,0,0,0,0,0,1,0,1,
        1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1]


    list = [a,b,c,d,e]
    return list
```

V. References:

- Excelino
- William
- Georgius
- Aldi
- python.spot.com
- stackoverflow
- Wikipedia
- Youtube
- Github