**FABULOUS SNAKE**

A Project

Presented to the Faculty of the

CICS – College of Information and Computing Sciences Bachelor of Science in Information Technology Marinduque State College

In Partial Fulfillment

of the Requirements for the subject

**COMPUTER GRAPHICS PROGRAMMING**

By:

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Instructor

**May 2023**

Republic of the Philippines 

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**RUBRICS FOR COMPUTER GRAPHICS PROGRAMMING –FINAL HANDS-ON EXAM**

| **Schedule:** | **Date:** |
| --- | --- |

**Game title:**

| **PROJECT CRITERIA** | **Highly**  **Implemented 5** | **Satisfactory**  **Implemente d**  **4** | **Fairly**  **Implemented**  **3** | **Partially**  **Implemented 2** | **Not**  **Implemented**  **1** |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **Game Design / Interface** Well-designed 2D Game Interface (15%) |  |  |  |  |  |
| **2D/3D Assets**  Well-designed 2D Assets  (15%) |  |  |  |  |  |
| **Animations**  Well Animated movement of Assets  (15%) |  |  |  |  |  |
| **Program Design**  The game can respond to  particular actions when there are collisions or intersections  (25%) |  |  |  |  |  |
| **Point System**  (10%) |  |  |  |  |  |
| **Game Levels**  (15%) |  |  |  |  |  |
|  |  |  |  |  |  |
| **DOCUMENTATION** | | | | | |
| **Completeness/Correctness** Ability to present the required document correctly.  (5%) | All the  required parts of the  document are present and  correct. | All parts of the  documents  are present  with  minimal  incorrect  parts. | Some parts of the document are missing. | Most parts  of the  documents  are missing  and a lot of  incorrect  parts were  observed. | No  documentatio n was  presented at  all. |
| **TOTAL** |  | | | | |
| **REMARKS** |  | | | | |

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| **Name of Student** | **Presentation/Q&A 50%** | **Project**  **Rating**  **50%** | **Total**  **Rating**  **100%** |
| --- | --- | --- | --- |
| **1. LN, FN MI** |  |  |  |
| **2. LN, FN MI** |  |  |  |

**Evaluated by:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**KAYE HARRIS E. SALVACION**

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**I. DESCRIPTION OF THE PROJECT**

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Welcome to an incredible game experience! This captivating game takes you on a thrilling adventure in a 2D game, created using the Python programming language. It is called as the Fabulous Snake Game it puts a unique twist on the classic snake game by introducing a snake that changes colors upon eating food. Prepare yourself for a nostalgic journey, complete with addictive gameplay, intuitive controls, and an insatiable desire for growth.

In the Fabulous game, you begin as a small creature, and your mission is to navigate the snake through the game grid, devouring food to increase its length. This Fabulous snake game has three levels easy, normal and difficult that the user can choose what level they want to play. It tests your skills and strategy as you carefully plan your path, avoiding collisions with walls or the snake owns body. One wrong move can lead to disaster, abruptly ending the game.

Remaining alert is crucial as you anticipate the snake's movements and strategize to achieve the highest possible score. Prepare to immerse yourself in the addictive magic of the Fabulous game, sharpening your reflexes, testing your strategic thinking, and embarking on an endless journey of growth and survival. Get ready to relive the exhilarating snake game experience in an extraordinary way. The main objective of the snake game is for the user to control the snake and guide it through the game grid. The primary is to eat food scattered throughout the grid, which increase the length of the snake. The users need to strategically navigate the snake, avoiding collisions with walls or its own body, as collisions in the end of the game.

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**II. DIAGRAM OF THE GAME**

****Start 



Main Menu



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Click Quit

NO YES

Want to 

play the 

game?



Click Play 

Choose level

Easy Normal Difficult Back 

**Figure 1. Main Menu**

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Easy 



Initial Game



Snake moving 200

milliseconds



NO 

Meet

food? 

YES 

Snake change color



Node increment food

generated

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Keep protection delay 

for moving



NO 

End

Press key to exit the game

YES

Game over?

**Figure 2. Easy Level**

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Normal 



Initial Game



Snake moving 100

milliseconds



NO 

Meet

food? 

YES 

Snake change color



Node increment food

generated

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Keep protection delay 

for moving



NO 

End

Press key to exit the game

YES

Game over?

**Figure 3. Normal Level**

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Difficult 



Initial Game



Snake moving 50

milliseconds



NO 

Meet

food? 

YES 

Snake change color



Node increment food

generated

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Keep protection delay 

for moving



NO 

End

Press key to exit the game

YES

Game over?

**Figure 4. Difficult Level**

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*Figure 4: Background*

In this figure, it represents the background of the fabulous snake game where the snake can move freely in all direction, but it must avoid collisions with walls.



*Figure 5: Food*

In this figure, it represents the food for the snake. The purpose of the food is to increase the length of the snake and change its color.

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**IV. SOURCE CODE OF THE GAME**

import pygame, sys, random, pygame.mixer

from pygame.math import Vector2

import pygame\_menu

class SNAKE:

def \_\_init\_\_(self):

self.body = [Vector2(5, 10), Vector2(4, 10), Vector2(3, 10)] self.direction = Vector2(1, 0)

self.new\_block = False

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self.colors = [(70, 100, 250), (250, 100, 100), (100, 255, 170), (0, 0, 255), (111, 0, 50)] self.crunch\_sound = pygame.mixer.Sound('crunch.mp3')

def draw\_snake(self):

for block in self.body:

x\_pos = int(block.x \* cell\_size)

y\_pos = int(block.y \* cell\_size)

block\_rect = pygame.Rect(x\_pos, y\_pos, cell\_size, cell\_size) pygame.draw.rect(screen, self.colors[0], block\_rect)

def move\_snake(self):

if self.new\_block:

body\_copy = self.body[:]

body\_copy.insert(0, body\_copy[0] + self.direction)

self.body = body\_copy[:]

self.new\_block = False

else:

body\_copy = self.body[:-1]

body\_copy.insert(0, body\_copy[0] + self.direction)

self.body = body\_copy[:]

def add\_block(self):

self.new\_block = True

self.change\_color()

def change\_color(self):

self.colors.pop(0)

random\_color = random.choice(self.colors)

self.colors.append(random\_color)

def game\_over(self):

pygame.mixer.music.stop()

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game\_over\_screen.show()

while True:

for event in pygame.event.get():

if event.type == pygame.QUIT: pygame.quit()

sys.exit()

elif event.type == pygame.KEYDOWN: if event.key == pygame.K\_RETURN: pygame.quit()

sys.exit()

def play\_crunch\_sound(self):

self.crunch\_sound.play()

class FOOD:

def \_\_init\_\_(self):

self.randomize()

def draw\_food(self):

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food\_rect = pygame.Rect(int(self.pos.x \* cell\_size), int(self.pos.y \* cell\_size), cell\_size, cell\_size)

screen.blit(imagee, food\_rect)

def randomize(self):

self.x = random.randint(0, cell\_number - 1)

self.y = random.randint(0, cell\_number - 1)

self.pos = Vector2(self.x, self.y)

class MAIN:

def \_\_init\_\_(self):

self.snake = SNAKE()

self.food = FOOD()

def update(self):

self.snake.move\_snake()

self.check\_collision()

self.check\_fail()

def draw\_elements(self):

self.food.draw\_food()

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self.snake.draw\_snake()

self.draw\_score()

def check\_collision(self):

if self.food.pos == self.snake.body[0]: self.food.randomize()

self.snake.add\_block()

self.snake.play\_crunch\_sound()

for block in self.snake.body[1:]:

if block == self.food.pos:

self.food.randomize()

def check\_fail(self):

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if not 0 <= self.snake.body[0].x < cell\_number or not 0 <= self.snake.body[0].y < cell\_number:

self.snake.game\_over()

for block in self.snake.body[1:]:

if block == self.snake.body[0]:

self.snake.game\_over()

def draw\_score(self):

score\_text = str(len(self.snake.body) - 3)

score\_surface = game\_font.render(score\_text, True, (0, 0, 0)) score\_x = int(cell\_size \* cell\_number - 60)

score\_y = int(cell\_size \* cell\_number - 40)

score\_rect = score\_surface.get\_rect(center=(score\_x, score\_y)) imagee\_rect = imagee.get\_rect(midright=(score\_rect.left, score\_rect.centery)) bg\_rect = pygame.Rect(imagee\_rect.left, imagee\_rect.top, imagee\_rect.width + score\_rect.width + 30,

imagee\_rect.height)

pygame.draw.rect(screen, (167, 209, 61), bg\_rect)

screen.blit(score\_surface, score\_rect)

screen.blit(imagee, imagee\_rect)

pygame.draw.rect(screen, (0, 0, 0), bg\_rect, 2)

class GAME\_OVER\_SCREEN:

def \_\_init\_\_(self):

self.font = pygame.font.Font('Super Bubble.ttf', 70)

self.text\_surface = self.font.render('Game Over', True, (0, 0, 0))

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self.text\_rect = self.text\_surface.get\_rect(center=(cell\_number \* cell\_size // 2, cell\_number \* cell\_size // 2))

self.gameover\_music = pygame.mixer.Sound('gameover.mp3')

def show(self):

screen.blit(self.text\_surface, self.text\_rect)

pygame.display.update()

self.gameover\_music.play()

while True:

for event in pygame.event.get():

if event.type == pygame.QUIT:

pygame.quit()

sys.exit()

elif event.type == pygame.KEYDOWN:

if event.key == pygame.K\_RETURN:

return

class MainMenu:

def \_\_init\_\_(self):

self.menu = pygame\_menu.Menu("Main Menu", cell\_number \* cell\_size, cell\_number \* cell\_size, theme=pygame\_menu.themes.THEME\_BLUE)

self.menu.add.button('Play', self.show\_difficulty\_menu)

self.menu.add.button('Quit', pygame\_menu.events.EXIT)

self.difficulty\_menu = None

def show\_difficulty\_menu(self):

self.menu.disable()

self.create\_difficulty\_menu()

def create\_difficulty\_menu(self):

self.difficulty\_menu = pygame\_menu.Menu("Difficulty", cell\_number \* cell\_size, cell\_number \* cell\_size, theme=pygame\_menu.themes.THEME\_BLUE)

self.difficulty\_menu.add.button('Easy', self.start\_game, 'easy')

self.difficulty\_menu.add.button('Normal', self.start\_game, 'normal')

self.difficulty\_menu.add.button('Difficult', self.start\_game, 'difficult')

self.difficulty\_menu.add.button('Back', self.show\_main\_menu)

self.difficulty\_menu.mainloop(screen)

def start\_game(self, difficulty):

if difficulty == 'easy':

pygame.time.set\_timer(SCREEN\_UPDATE, 200)

elif difficulty == 'normal':

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pygame.time.set\_timer(SCREEN\_UPDATE, 100) elif difficulty == 'difficult':

pygame.time.set\_timer(SCREEN\_UPDATE, 50)

main\_game.difficulty = difficulty

self.difficulty\_menu.disable()

def show\_main\_menu(self):

self.difficulty\_menu.disable()

self.menu.enable()

def show(self):

self.menu.mainloop(screen)

pygame.init()

cell\_size = 30

cell\_number = 24

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screen = pygame.display.set\_mode((cell\_number \* cell\_size, cell\_number \* cell\_size)) pygame.display.set\_caption("FABULOUS SNAKE GAME")

clock = pygame.time.Clock()

imagee = pygame.image.load('imagee.jpg').convert\_alpha()

game\_font = pygame.font.Font('Super Bubble.ttf', 25)

background\_image = pygame.image.load("background.jpg")

background\_image = pygame.transform.scale(background\_image, (cell\_number \* cell\_size, cell\_number \* cell\_size))

SCREEN\_UPDATE = pygame.USEREVENT

pygame.time.set\_timer(SCREEN\_UPDATE, 0)

pygame.mixer.music.load('background\_music.mp3')

pygame.mixer.music.play(-1)

main\_game = MAIN()

game\_over\_screen = GAME\_OVER\_SCREEN()

main\_menu = MainMenu()

main\_menu.show()

while True:

for event in pygame.event.get():

if event.type == pygame.QUIT:

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pygame.quit()

sys.exit()

if event.type == SCREEN\_UPDATE: main\_game.update()

if event.type == pygame.KEYDOWN: if event.key == pygame.K\_UP:

if main\_game.snake.direction.y != 1: main\_game.snake.direction = Vector2(0, -1) if event.key == pygame.K\_RIGHT: if main\_game.snake.direction.x != -1: main\_game.snake.direction = Vector2(1, 0) if event.key == pygame.K\_DOWN: if main\_game.snake.direction.y != -1: main\_game.snake.direction = Vector2(0, 1) if event.key == pygame.K\_LEFT:

if main\_game.snake.direction.x != 1: main\_game.snake.direction = Vector2(-1, 0)

screen.blit(background\_image, (0, 0))

main\_game.draw\_elements()

pygame.display.update()

clock.tick(60)

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**IV. SCREEN SHOTS OF THE OUTPUT**

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*Fig. 6 Main Menu*

In this figure, it is a beginning of the game where in the user will be ask if they want to play or quit the game.

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*Fig. 7 levels of Game*

In this figure, it shows the level of the game, easy, normal and difficult. The

user will choose what level they want to play. If the user don’t want to play just click back to return in main menu.

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*Fig. 8 The Game*

In this figure, it’s about the start of the game. It shows the score and increase the length of the snake every time they eat food.

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*Fig. 9 Game Over*

In this figure, when the snake collides with walls or bumps into it’s own body the game will be over.

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