COVID ESCAPE – GAME PROJECT

University of New Haven
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Python Project Report

Submitted by
Group – 6

CSCI – 6651 : Script Programming/Python

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CONTEXT

- We all know that COVID is a virus that had a dreadful impact on the humanity as it became a challenge to the public health and food systems. This caused an economic and social disruption for the past couple of years keeping people at risk.

- So, we have decided to develop a game that would create an awareness among the people to be more cautious to protect ourselves from these viruses like covid. This game reminds and motivates users the importance of wearing a mask in this pandemic era.

- In this game, the player will be the character of a civilian without a mask who tries to survive through every covid wave he passes which is often represented as virus contaminated pipes in the game. The player should try to survive as many pipes as he can in order to win. This project will be implemented using Python 3, PyCharm IDE and modules like PyGame.

INTRODUCTION

The Covid Escape – Game's main purpose is to create awareness among people the importance of wearing a mask to protect ourselves from covid. In order to play the game, the player who is a character of normal citizen must try to pass through every covid contaminated pipe which indeed refers to the real life covid waves we have faced. So, one must pass through the pipes without encountering them. This is a relatable and engaging survival game that allows the player to enhance their concentration skills while having a wonderful time. The most interesting point is it is not restricted to people belonging to a particular age or gender. So, any individual can play the game and will be fascinated by the interactive user interface. The game interface is separated into three instances : first, Title screen where the player will be able to interact with the game by click and will be proceeding to the next screen by clicking anywhere on the screen. Second, Main Game screen where the player will be able to play the game by interaction with the same click. Third, Game Over screen the player will be directed to this screen when he encounters one of the pipes and collapses on the ground which is game over for the player and also the total score will be shown on the game over screen and also a restart button will be displayed for the player to play the game again. The most interesting part is that on game over, the game will be displaying a motivational message to wear a mask and creates an awareness to the player to protect ourselves from viruses like covid which is the primary goal of our game project.

PROBLEM FORMULATION

The current covid pandemic has had an impact on all of us. Nevertheless, depending on our situation, the pandemic's impact and its effects are perceived in different ways. While some people attempt to adjust to working online, homeschooling their kids, others are forced to be exposed to the virus in order to sustain in this society.

The requirement to wear a face mask in eateries, supermarkets, as well as other public areas is one of the most notable lifestyle changes brought on us by the covid pandemic going on. To stop the spread of this deadly virus that affects humanity fatally, it is essential to wear a mask, particularly when we are around other individuals. Lot of people who were infected with covid virus don't show any of its symptoms but still has the ability to spread the virus as it is contagious and airborne. So, public knowledge of proper masking is very essential.

This thought led us to the development of the Covid Escape Game, which is one of the ways to create awareness among the people about the importance of wearing a mask and maintaining social distancing by playing the game encountering each and every covid contaminated pipe (covid wave) without coming in contact with them in order to survive more number of covid waves.

ALIGNMENT WITH KEEN FRAMEWORKS (3 CS)

CURIOSITY

This project will be a survival game which is all about surviving the covid waves without coming in contact with the virus. This whole concept makes this game totally relatable and will give an engaging experience.

CONNECTIONS

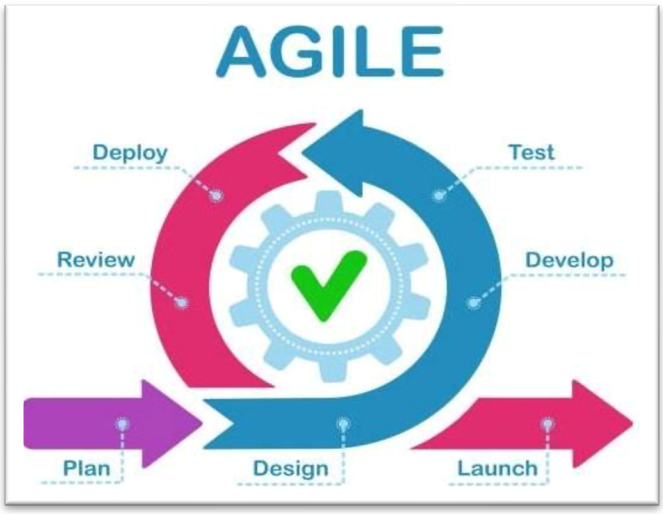
This is a 2d game that will be built using Python 3 and also, we will be using PyCharm as the integrated development environment to develop our code and design the functionalities. PyGame is the gaming engine module we have chosen to make the visual interface more interactive and engaging.

CREATING VALUE

This project will create an awareness among the people about the importance of wearing mask and preventing the spread of covid. This game can be engaging and provides the information which educates and motivates everyone to curb the spread of viruses like covid.

METHODOLOGY

For successful outcome of this project, we followed Agile Methodology in order to assign tasks and complete this project systematically and planned every step to complete it on time.

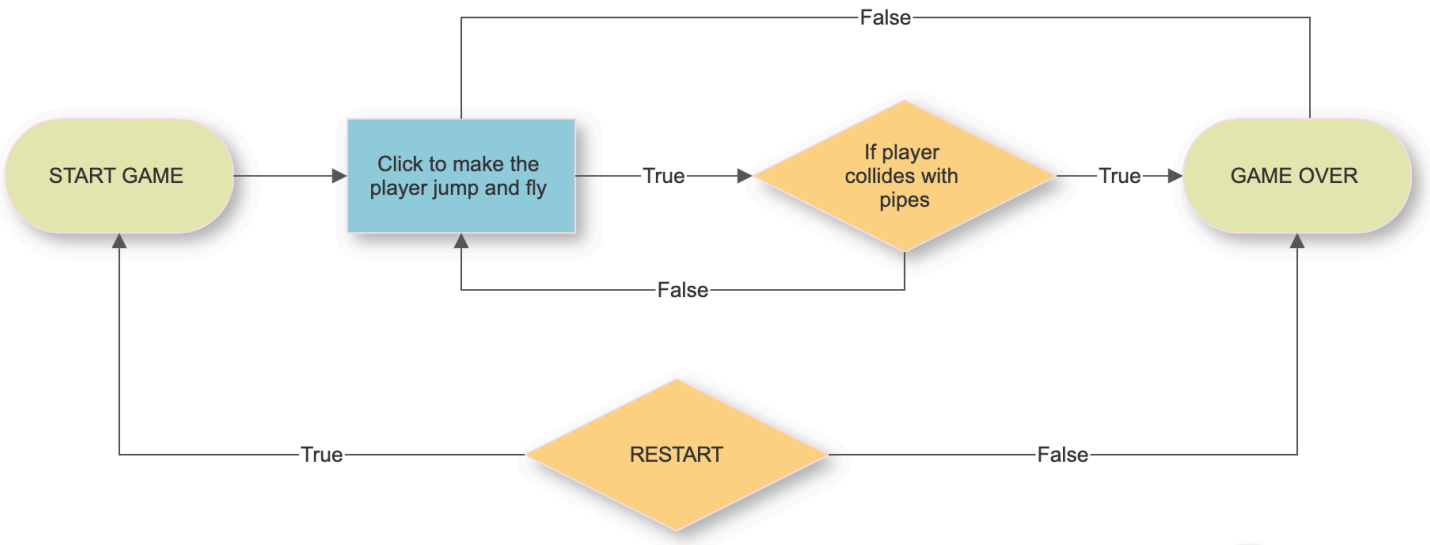


The following requirements must be fulfilled for the successful completion of our project : We as a group came up with the concept of developing an interactive survival game with a purpose that could be played by everyone, regardless of their gender or age. To do this, PyCharm IDE for game development, the pygame interface, and any other necessary packages for the game's functioning are required. Our entire team has collected all these needs.

DESIGN

Our game was developed from scratch with all these requirements and functionalities that have been designed for the game to develop the GUI using Python, Pycharm interface and all other essential libraries.

Work Flow



DEVELOPMENT

- First all the assets have been accumulated that are required by the game.
- The pygame has been initiated and the background and the scrolling base has been set with the required coordinates on the pygame interface.
- Next, the player sprite has been initiated and all the functionalities of the player like jump, collide haven been called in these functionalities through the methods.
- Then, the pipe sprite has been initiated with the functionalities that would make the pipes set above the base level and shown flip over the top and bottom which will be generated on the pygame till the game is over
- The score counter has been initiated with the draw text function at the top of the pygame interface where the parameters like font, size and color has been set in the logic.
- Finally, the restart sprite class has been created for the player to play the game again where we have set the image with coordinates set on the game over screen.

Player Class :

```
#Defining sprite class Player
class Player(pygame.sprite.Sprite):
    def __init__(self, x, y):
        pygame.sprite.Sprite.__init__(self)
        self.images = []
        self.index = 0
        self.counter = 0
        for num in range(1, 4):
            img = pygame.image.load(f'naruto.png')
            self.images.append(img)
        self.image = self.images[self.index]
        self.rect = self.image.get_rect()
        self.rect.center = [x, y]
        self.vel = 0
        self.clicked = False

#Defining update
    def update(self):
```

Pipe Class :

```
#Defining sprite class Pipe
class Pipe(pygame.sprite.Sprite):
    def __init__(self, x, y, position):
        pygame.sprite.Sprite.__init__(self)
        self.image = pygame.image.load('pipe.png')
        self.rect = self.image.get_rect()

        #Position 1 is from the top, -1 is from the bottom assigning to pipes
        if position == 1:
            self.image = pygame.transform.flip(self.image, False, True)
            self.rect.bottomleft = [x, y - i
        if position == -1:
            self.rect.topleft = [x, y + int(pipe_gap / 2)]

    def update(self):
        self.rect.x -= scroll_speed
        if self.rect.right < 0:
            self.kill()
```

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Restart Button Class :

```
#Defining sprite class Button
class Button():
    def __init__(self, x, y, image):
        self.image = image
        self.rect = self.image.get_rect()
        self.rect.topleft = (x, y)

    #Defining draw function
    def draw(self):
        action = False

        #Get mouse position
        pos = pygame.mouse.get_pos()

        #Check if the mouse is over the button
        if self.rect.collidepoint(pos):
            if pygame.mouse.get_pressed()[0] == 1:
                action = True

        #Draw button
        screen.blit(self.image, (self.rect.x, self.rect.y))
        return action
```

Output :

TESTING

We tested our code in a similar manner to how it was developed. We explored every area of the interface to test the game's overall structure, and we tested the player by seeing if the score updated when they made it through the pipes. Since manual testing is a low-cost method, we did it to make sure everything was functioning properly.

DEPLOYMENT

As our game's execution begins with Pygame.py, which contains the setting of coordinates as well as the initialization process. The user can use any kind of device to make sure the game functions smoothly in any given situation.

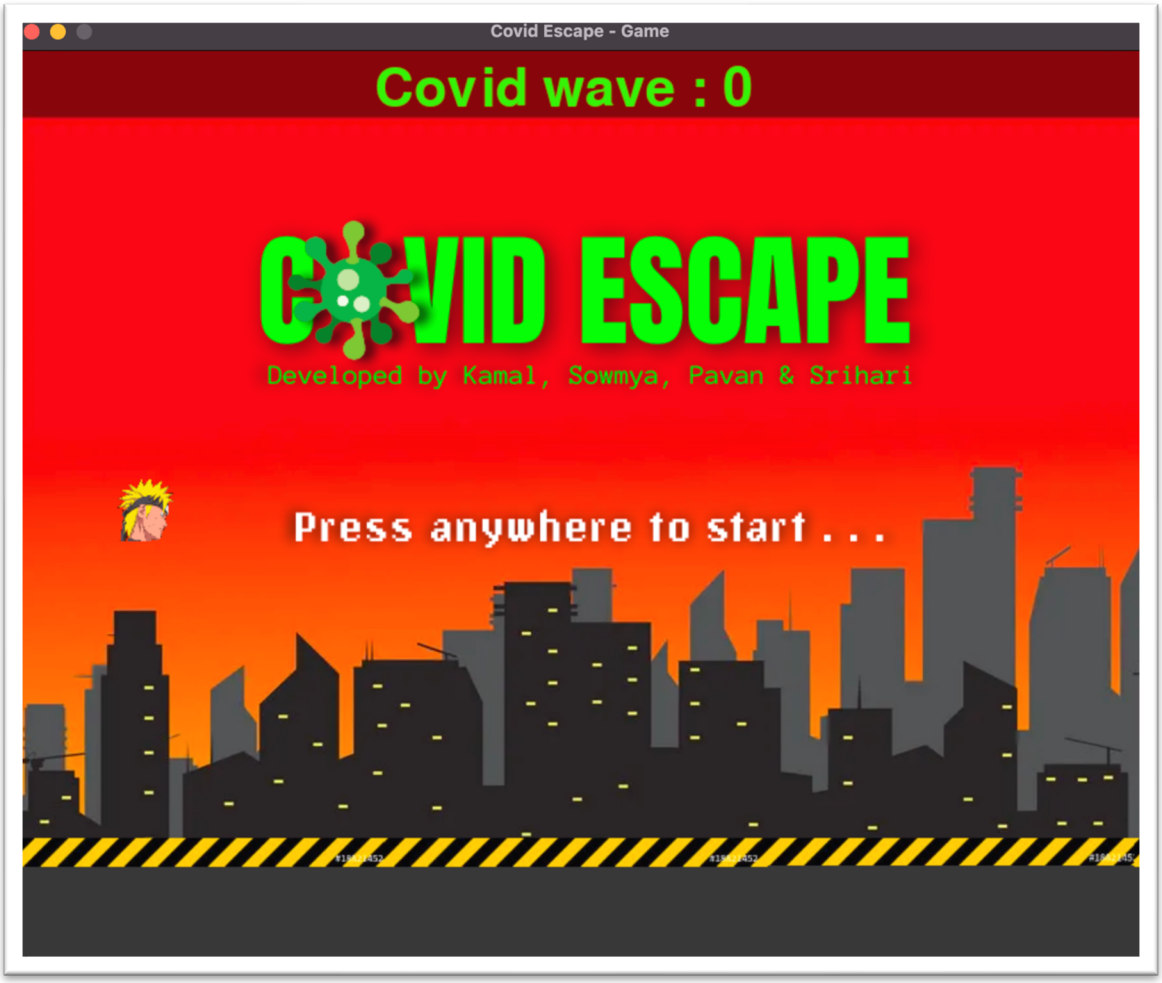
Since there will be room for improvement in terms of new features and discovering flaws and debugging them in order to rectify the code and find a solution at an early stage, we have chosen the agile development methodology. This methodology allows for the delivery of apps in multiple iterations while allowing developers to debug and alter the code as needed.

PROPOSED SOLUTION

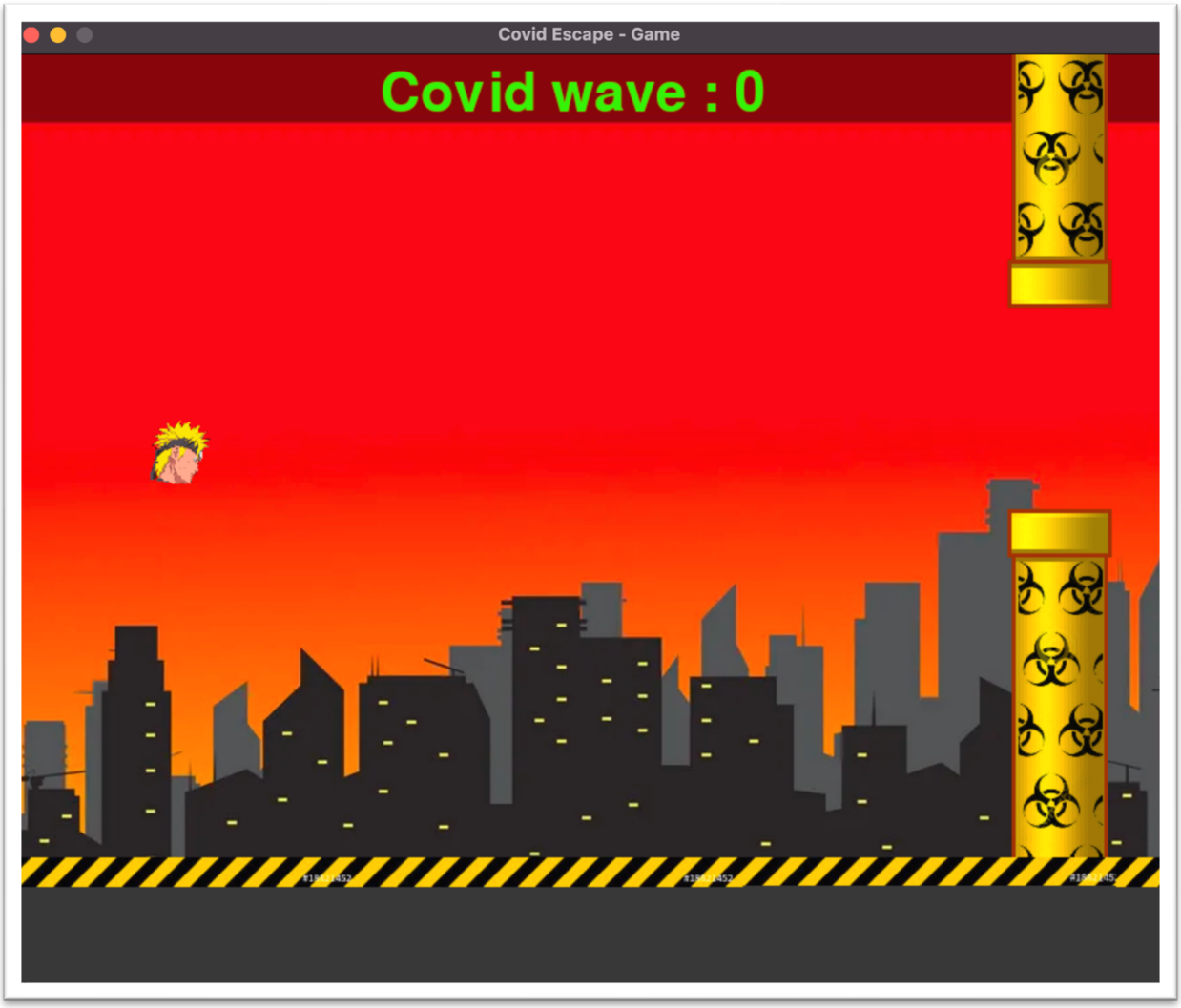
For this game, We came up with the solution which will be separated into three sections and they are :

1. Title Screen
2. Main Game Screen
3. Game Over Screen

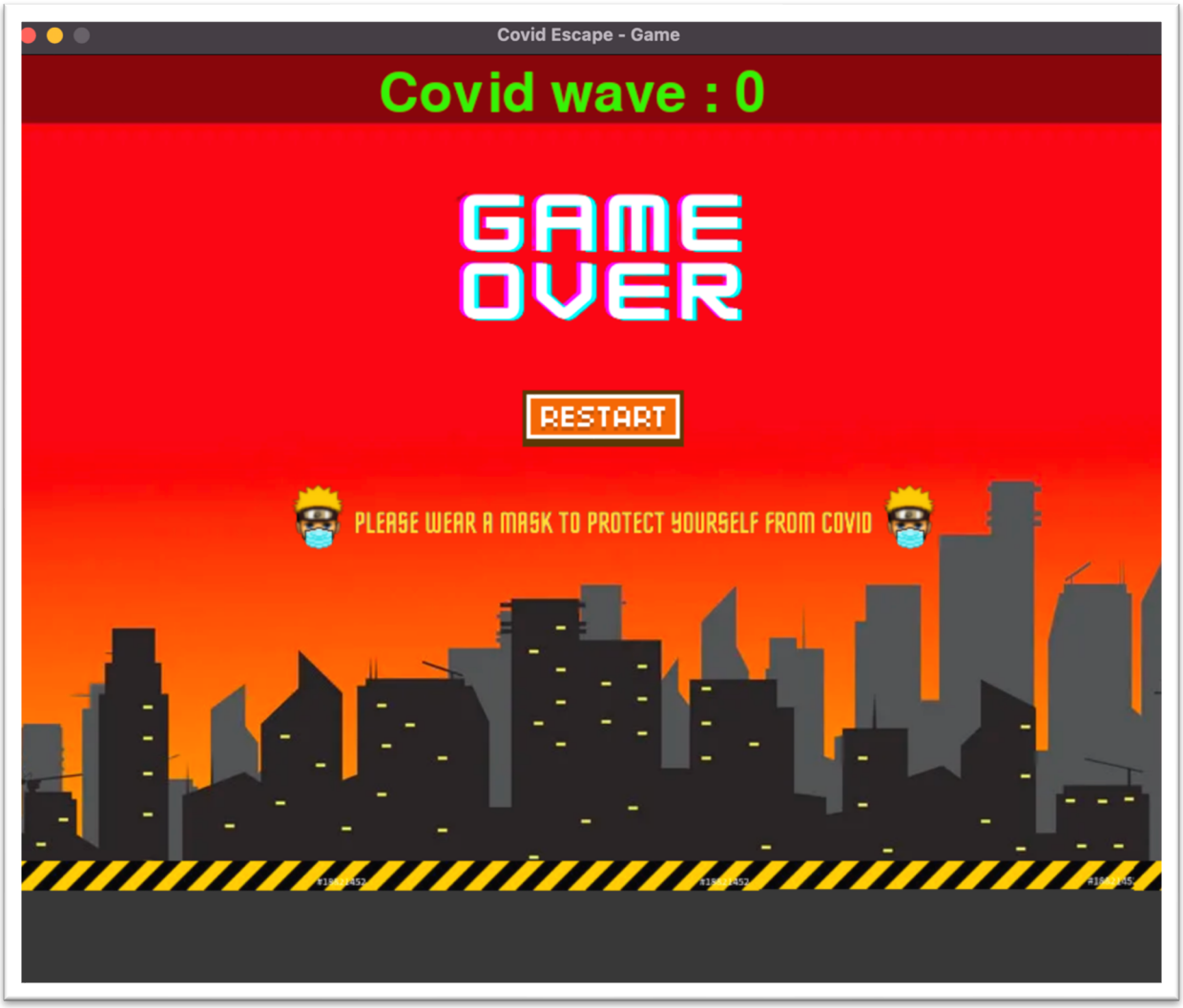
For the title screen we came up with the solution, where on launching the player will directed to this title screen where the player will have the option to press anywhere to start, which is the game will start on user interaction with the click on the screen.



For the Main Game screen we came up with the solution, where the player will be able to play the game by interaction with the click on the screen, on every click the player will be able to jump higher and higher and the only goal of the player is to escape coming to contact with the covid contaminated pipes and pass those pipes through the gaps and survive as many pipes he can in order to win the game, So we have designed in such a way that if the player collides with the pipes, then its game over. While player is playing the game, we have set the score counter where the player can see the number of covid waves he has survived. Apart from this to make the game more interesting we have included sound while the player is jumping.



For the Game Over screen, we came up with the solution, where the player will be directed to this screen when he encounters one of the pipes and collapses on the ground which is game over for the player and the total score will be shown on the game over screen. Nevertheless, a restart button will be displayed for the player to play the game again. The most interesting part is that on game over, the game will be displaying a motivational message to wear a mask and creates an awareness to the player to protect ourselves from viruses like covid which is the primary goal of our game project. Similar to the sound for the player during main game, we have also added a typical game over sound for this section.



LIMITATIONS

- Creating advanced logic to make the player rotate and jump to pass through the pipes.
- Identifying and fixing the bugs caused by the pygame during the testing phase which involves a lot of teamwork as each were assigned specific tasks in the code.
- While designing the required assets using photoshop cc in an interactive manner that are required for the game.

FUTURE EXTENSIONS

- User interface can be more optimized by creating interesting and more interactive objects to attract the client.
- Implement obstacles (mutated covid variants) and bonus power (vaccination) to increase the game complexity and make it more interesting.
- Advance the game level by increasing player speed after passing a certain number of contaminated pipes.
- Create a database to store the player's name and score they have achieved to make game interesting and more competitive.
- Increase the difficulty of the game by decreasing the distance between the pipes as the game advances.

CONCLUSION

We have implemented a game environment for the player to educate and create awareness about wearing a mask in this game Covid Escape. We have designed three sections for its implementation and have succeeded in those section which is working totally fine based on the required functionalities we have designed for the game. To improve this game's environment, we have added motivational message to be displayed on the game over screen to create awareness on the topic we have chosen which was our primary goal with the help of PyCharm Interface, Pygame module and a few other libraries. This makes our game more engaging and totally relatable to play.

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