Objective

Player should be able to reach final destination B(top right), starting at the initial point A(bottom left), dodging obstacles on the path.

Different Aspects of game

Players

It is a single player game and input from the same is taken into account throughout the game session. Arrow keys are used to control the player movement

Gameplay

It is narrated by the computer with different obstacles which are of various types

1. *Stationary*: Obstacles including various shapes like cubes, spheres, prisms, trees, buildings etc
2. *Moving*: Obstacles shown spinning down ramps and rolling across the gameboard
3. *Falling*: After about 15 seconds of game play, objects start falling, shown using the particle effect of shadows and lighting.

Score: Increase the score for each obstacle the player manages to avoid. For Stationary objects, score increments by 10, for moving objects it gets incremented by 20 and 50 for the falling objects. If the player successfully reaches destination B without dying (health reducing to 0), increment the score by 100.

Health: It starts at 100 and with every obstacle hit, it shall go down by 50 for stationary obstacles hit, by 20 for moving obstacles and 10 for falling obstacles. As soon as health reaches 0, the game terminates and the player's final score is flashed on screen

Background Music : Pink Panther Theme song.

Particle effect: Shadows used for depicting falling objects realistically.

Whenever the player bumps into an obstacle, its colour changes momentarily. The collision also creates a noise.

Constraining Measures

1. Requires one player for the game to be played
2. At any point, players health reduces to 0, player will die and game exits.
3. Each obstacles has a fixed score which will be subtracted from the score if he collides with the same.

High Level Design

Scenes- Game includes 3 scenes

1. MainMenu – It is used to create Main Menu which mainly includes items like Play Rulebook and Quit.

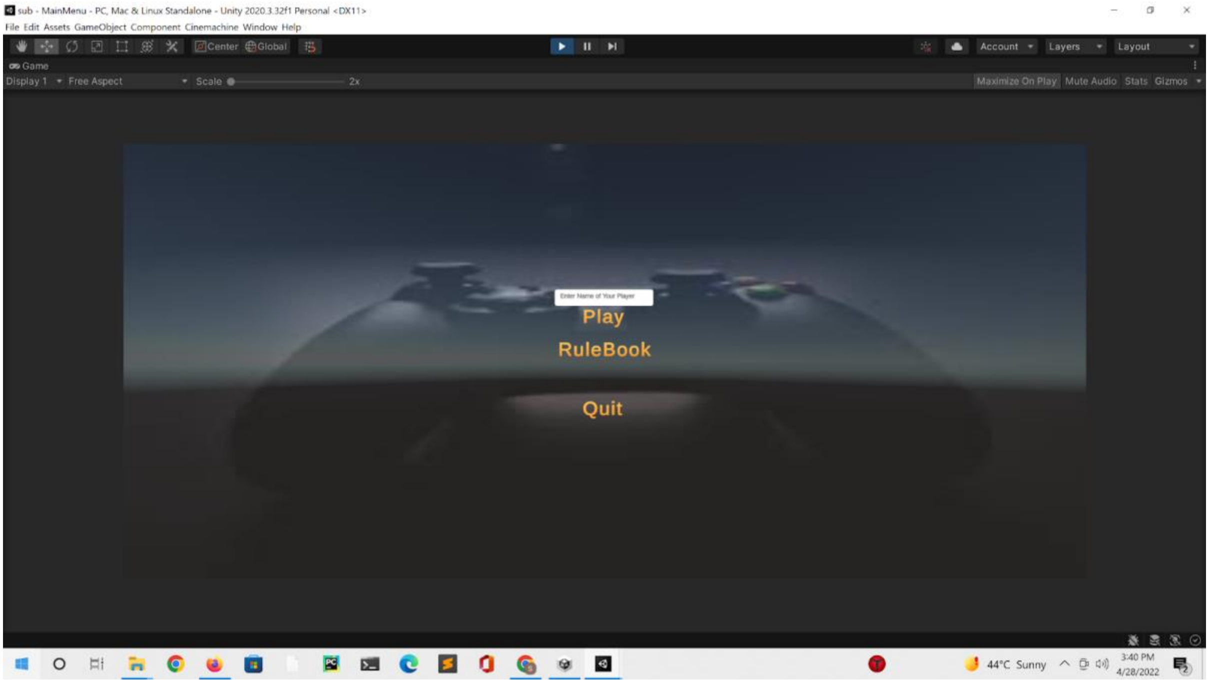
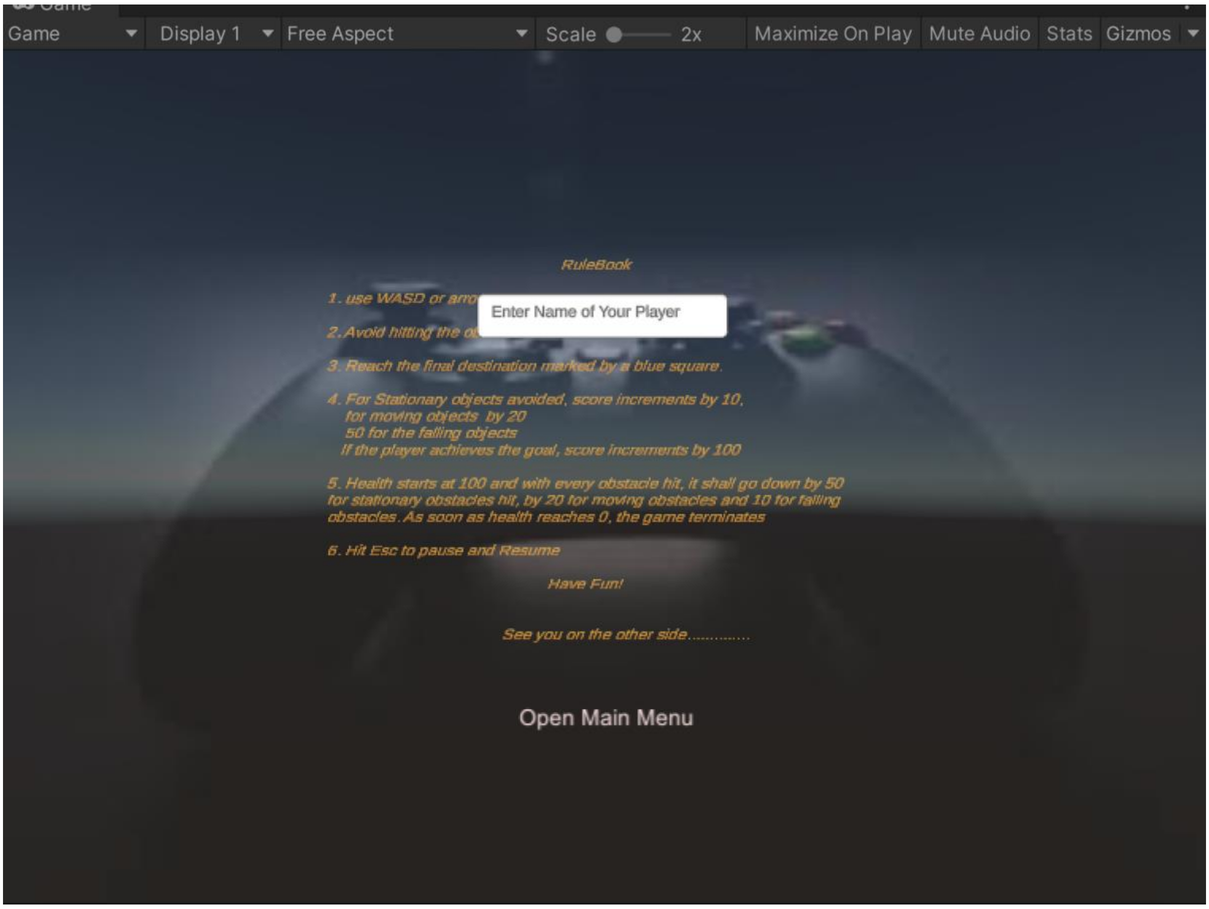

sub - MainMenu - PC, Mac & Linux Standalone - Unity 2020.3.32f1 Personal <DX11>
File Edit Assets GameObject Component Cinemachine Window Help
Center
Global
Account
Layers
Layout
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Mute Audio
Stats
Gizmos
Enter Name of Your Player
Play
RuleBook
Quit
44°C Sunny
3:40 PM
4/28/2022

Figure 1 Screenshot of Main menu

2. RuleBook – It will display the various rules of the game and will be loaded once player clicks on the RuleBook button of the Main Menu.



RuleBook

1. use WASD or arro

Enter Name of Your Player

2. Avoid hitting the o

3. Reach the final destination marked by a blue square.

4. For Stationary objects avoided, score increments by 10,
for moving objects by 20
50 for the falling objects
If the player achieves the goal, score increments by 100

5. Health starts at 100 and with every obstacle hit, it shall go down by 50 for stationary obstacles hit, by 20 for moving obstacles and 10 for falling obstacles. As soon as health reaches 0, the game terminates

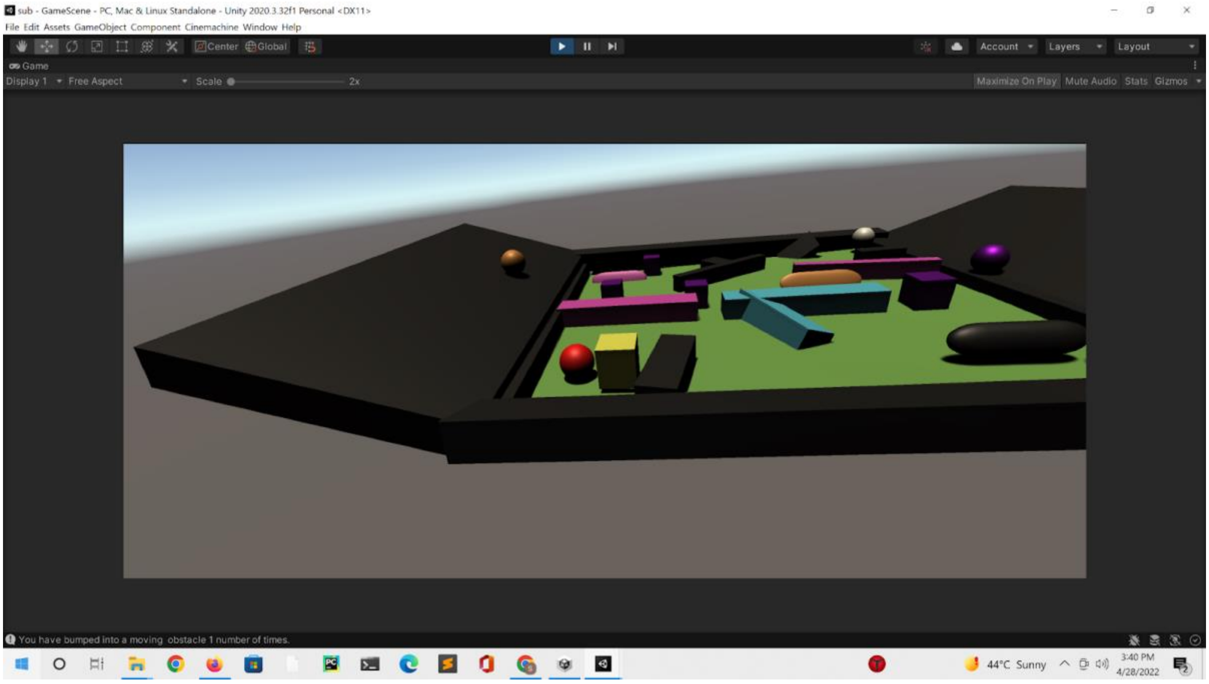
6. Hit Esc to pause and Resume

Have Fun!

See you on the other side..............

Open Main Menu

3. GameScene – It is loaded once player clicks on the Play button. This is the main/first level which player gets once he starts playing the game.

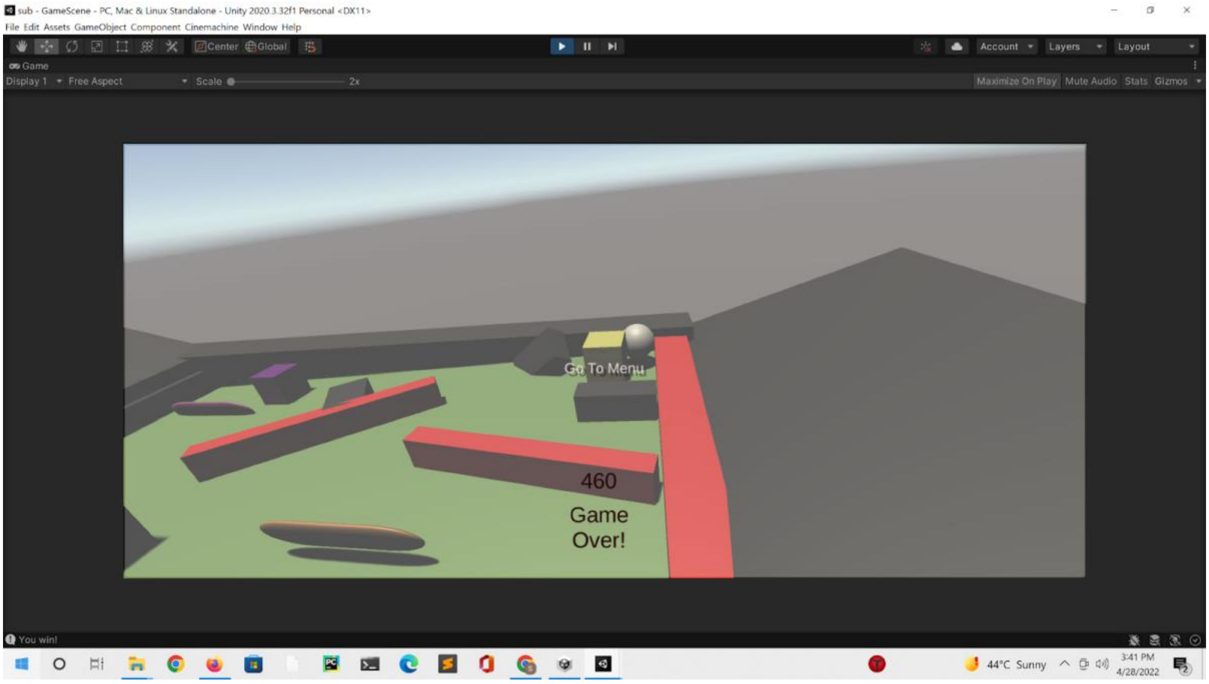


sub - GameScene - PC, Mac & Linux Standalone - Unity 2020.3.32f1 Personal <DX11>
File Edit Assets GameObject Component Cinemachine Window Help
Center
Global
Account
Layers
Layout
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Mute Audio
Stats
Gizmos
44°C Sunny
3:40 PM
4/28/2022

You have bumped into a moving obstacle 1 number of times.

Figure 2 Screenshot of Game Scene

4.

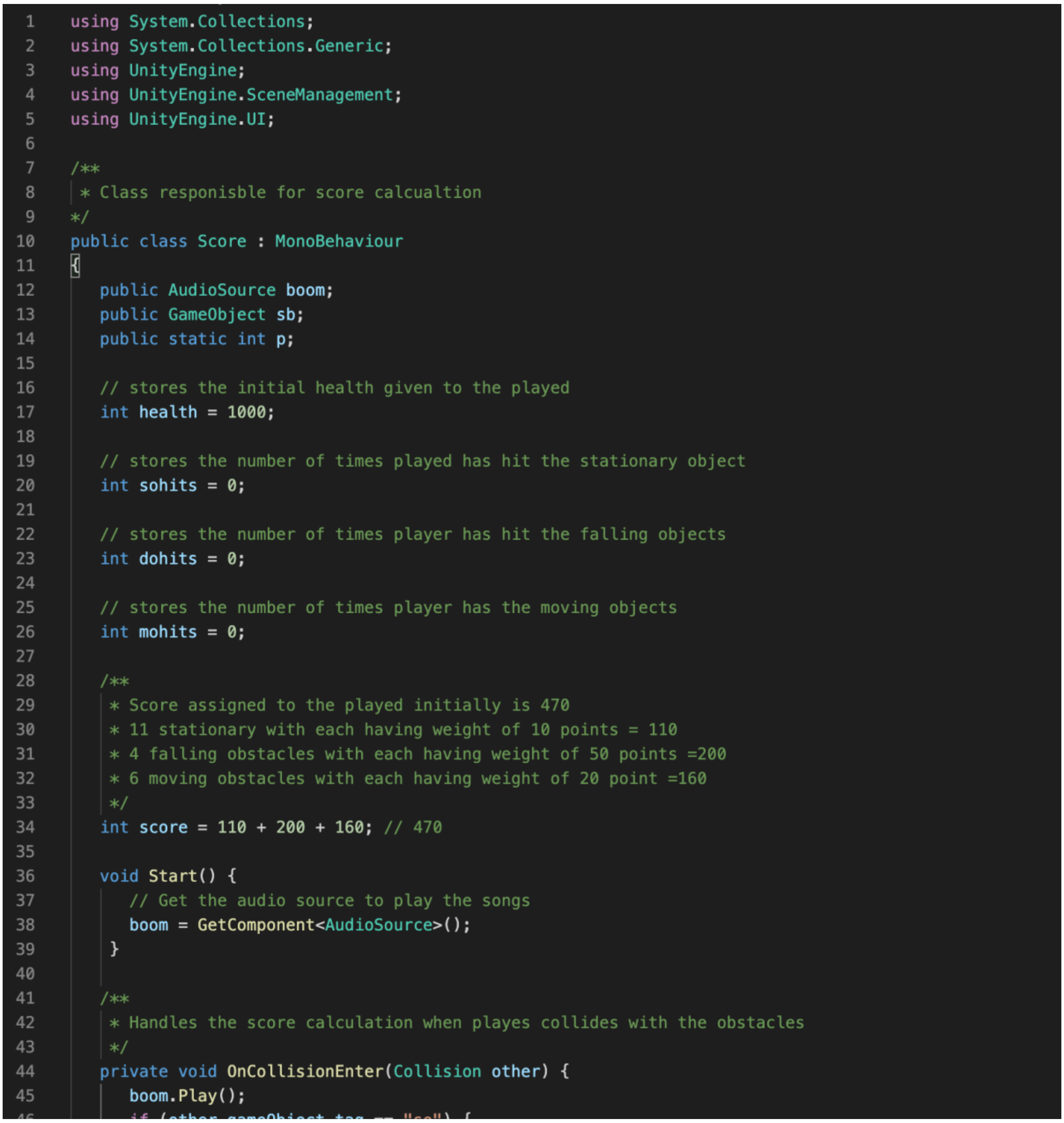


You win!

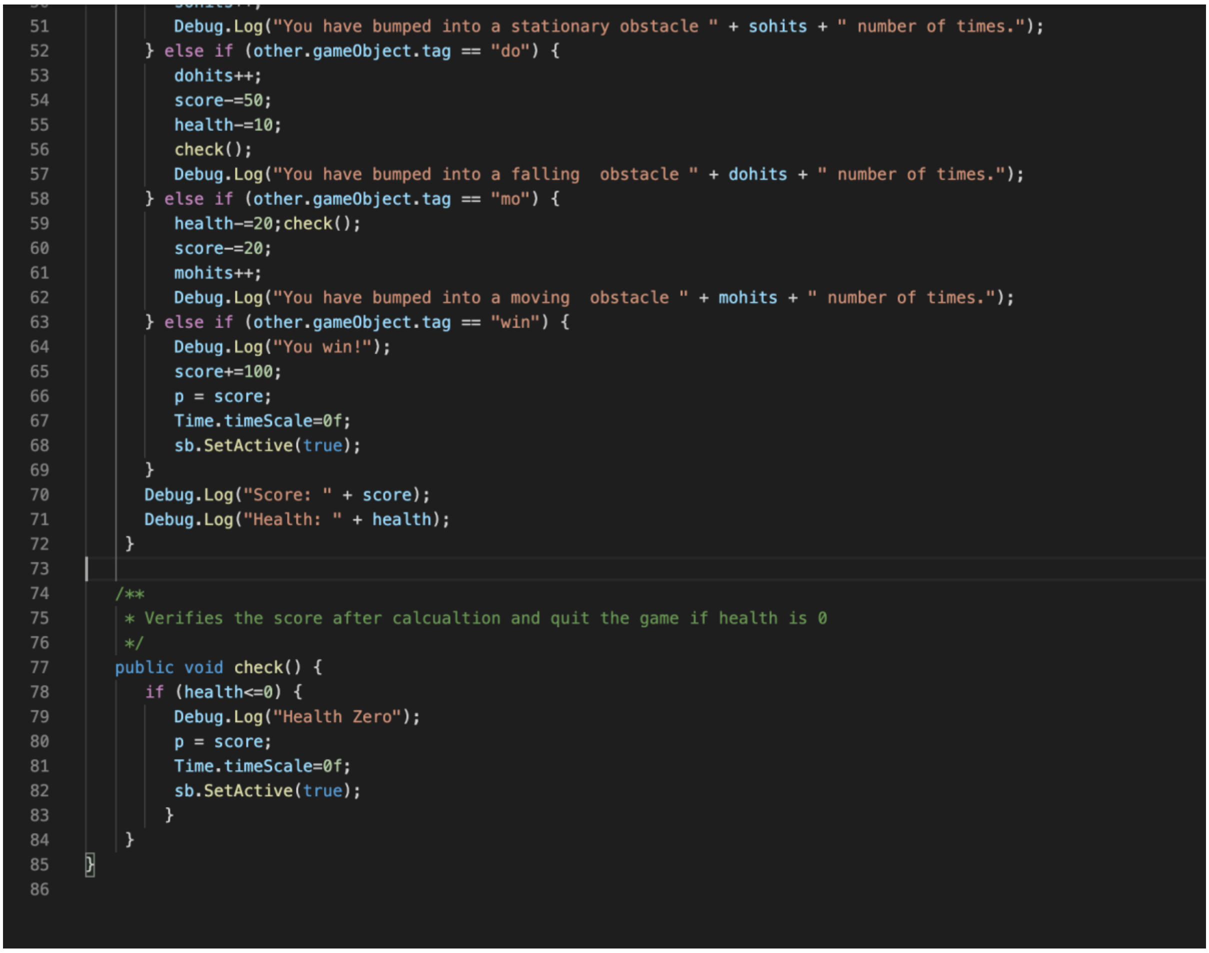
Figure 3 Screenshot of Score Scene

Low Level Design-

Score Calculation



```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using UnityEngine.SceneManagement;
using UnityEngine.UI;

/**
 * Class responisble for score calcualtion
*/
public class Score : MonoBehaviour
{
    public AudioSource boom;
    public GameObject sb;
    public static int p;

    // stores the initial health given to the played
    int health = 1000;

    // stores the number of times played has hit the stationary object
    int sohits = 0;

    // stores the number of times player has hit the falling objects
    int dohits = 0;

    // stores the number of times player has the moving objects
    int mohits = 0;

    /**
     * Score assigned to the played initially is 470
     * 11 stationary with each having weight of 10 points = 110
     * 4 falling obstacles with each having weight of 50 points =200
     * 6 moving obstacles with each having weight of 20 point =160
     */
    int score = 110 + 200 + 160; // 470

    void Start() {
        // Get the audio source to play the songs
        boom = GetComponent<AudioSource>();
     }

    /**
     * Handles the score calculation when playes collides with the obstacles
     */
    private void OnCollisionEnter(Collision other) {
        boom.Play();
        if (other.gameObject.tag == "so") {
```



```
            Debug.Log("You have bumped into a stationary obstacle " + sohits + " number of times.");
        } else if (other.gameObject.tag == "do") {
            dohits++;
            score-=50;
            health-=10;
            check();
            Debug.Log("You have bumped into a falling  obstacle " + dohits + " number of times.");
        } else if (other.gameObject.tag == "mo") {
            health-=20;check();
            score-=20;
            mohits++;
            Debug.Log("You have bumped into a moving  obstacle " + mohits + " number of times.");
        } else if (other.gameObject.tag == "win") {
            Debug.Log("You win!");
            score+=100;
            p = score;
            Time.timeScale=0f;
            sb.SetActive(true);
        }
        Debug.Log("Score: " + score);
        Debug.Log("Health: " + health);
    }

    /**
     * Verifies the score after calcualtion and quit the game if health is 0
     */
    public void check() {
        if (health<=0) {
            Debug.Log("Health Zero");
            p = score;
            Time.timeScale=0f;
            sb.SetActive(true);
          }
    }
}
```

Future work

1. Multi-player mode
2. Obstacles with various realistic shapes like trees, home etc to make the game more interesting
3. Include diff sound effects on the collision with different types of obstacles.
4. Change the position of obstacles with every session to make it less predictable and exciting for user.

References

1. https://docs.unity3d.com
2. https://www.youtube.com/c/Brackeys
3. https://www.udemy.com/course/unitycourse2/learn/lecture/24877952#overview