

**DESIGN AND DEVELOPMENT OF AN ADVENTURE GAME  
"THE BENGAL KNIGHT: SONARGAON"**

**BY**

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This Report Presented in Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science in Computer Science and Engineering

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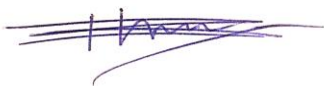
**SEPTEMBER 2021**

## **APPROVAL**

This Project titled “**Design and Development of an adventure Game The Bengal Knight: Sonargaon**”, submitted by **Abrar khan** and **Bishal biswas** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 11 September, 2021

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## DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Dr. Sheak Rashed Haider Noori, Associate professor & Associate Head, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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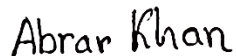
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Finally, we must acknowledge with due respect the constant support and patients of our parents.

## ABSTRACT

This project has been conducted in order to developing a 3D game that can be used for entertainment and as an efficient way of learning. Young generation in recent days are heavily attracted to the gaming and as a result they are influencing by the western culture and norms. “**The Bengal Knight: Sonargoan**” is a process to link our golden history with an action based modern open world game. In this game, user has to play one of the Baro Bhuiyan, Selim. Through the character game play user would be acquaintance with medieval Bengal, its beauty and culture. We have developed a single level gameplay where player has to hunt deer in the woods. This project is a very first concept of developing a game that narrates one of the golden ages of Bangladesh history, the Baro Bhuiyan in gaming industry of Bangladesh. We have used Unity 3D game engine to develop the game and have chosen C-sharp as a programming language. We have also utilized the Blender software to implement the 3D model like the trees, wild animals, terrain, characters and so on. This report will also work as a specimen of using Unity 2019 platform.

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# CHAPTER 1

## INTRODUCTION

### 1.1. Introduction of The Bengal knight

Bangladesh is a land of heroic myths and epics. From the dawn of civilization this part of land has been assembling a great number of lionhearts. All these contributions have led today's free and developed modern Bangladesh. But since the globalization, our rich history is becoming obsolete in the face of western culture. Now a day's our young generations are more aware of Norse and Greek mythology than our local legends. With the modernization, young people are more attached to digital medium rather than books or other traditional one. The gaming industry in our country is under developed yet but its market is insurging quite a lot. From a gaming analytics provider, Newzoo, Bangladesh gaming market is almost worth \$62.22 million<sup>[7]</sup>. Bangladesh has even represented in the global gaming competition such as World Cyber Games (WCG). So, there is a huge potentiality of our gaming market. And when local culture and myth are mixed with this trend it's become more propitious than ever.

From that point of view, "The Bengal knight: Sonargoan", is a treat in this regard. In this game we try to show the medieval Bangla. The story has described the reign of "Baro Bhuiyan" in the then capital of Bengal, Sonargoan. Users can enjoy the life of people and endorse the beauty of nature from late 16<sup>th</sup> century. It is an open world adventure game. So, Player can learn the lifestyle from character development as well. In this project we have tried to show a day from Selim, the playable character, as he (the player) has to hunt in the jungle. We used unity engine for game development with C# scripting language.

### 1.2. Motivation:

The knights along the history of our country have gifted us the beautiful future as we enjoy now. But with the passage of time the epics of those knights are into oblivion. Baro Bhuiyan are the cherished heroes from the late 16<sup>th</sup>. They kept Bangla safe from foreign invasion with their courage and dedication. We have tried to construct one of the knights

of Baro Bhuiyan, Selim. The young generation would become more aware of our rich culture and heroic past when they play the game. Open world game is very entertaining. We have tried to blend the history lesson into our entertainment as this is the very first attempt in our neglected gaming industry.

### **1.3. Adventure game:**

*An adventure game is a software program which presents an artificial environment with which the user must interact in order to solve the problems presented in the game <sup>[8]</sup>. In an adventure game the game environment is just a story where the user interacts with different characters and solve problems to reveal the climax.*

### **1.4. Open world Environment:**

In the open world game, a gamer has the ability to roam freely in a virtual world and also have the freedom to approaching a game object. An open world game allows the player to roam anywhere in the game environment without loading screens.

### **1.5. Objective:**

1. Entertain people.
2. Making of own game to get skilled.
3. To revive of the bio-grapy of a Bangle great to young generation.

### **1.6. Report summary:**

Chapter one is the introductory part of the project. Chapter two depicts the review of the background studies. Chapter three contains the game overview. Chapter four describes the requirement specification. Chapter five includes the design and development of the project. Implementation and testing of the software is detailed in chapter six. In chapter seven, limitations and future potentiality of the project has been described along with concluding remarks.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1. Introduction:**

Gaming is a great source of entertainment. But also, through game we can learn a lot of things. In our country there is limited number of game development organizations. Another problem developer faces are the less documentation about game development. Besides there are no specific courses in any university related to game development. Developers have to learn the technical knowhow through experience and individual workup. Thus, it has become a neglected area so far. But games can be a strong tool to teach with graphical presentation. Very a few games from local developers have come into light even in this digital Bangladesh. But whenever a local game has been introduced in the market it has created a wave of attraction to the gamer's community. So, there is a potential market and a lot demand of games that includes local history. Through our game we have tried to give a graphical view to certain period of time in our Bengali history.

#### **2.2. Related work:**

There was a game development project named "PENG XIA 3D Game Development with Unity A Case Study: A First-Person Shooter (FPS) Game". This project used a 3D game engine unity that could be used for fun and as an efficient way of teaching. The player could play on or off the Background Music, view the information of the controller and author and start or end this game on the GUI scene. They used unity as the game engine.[5]

Another game development project "Design and implementation of a single-player first-person shooter game using XNA game development studio". They used New York City as their game starting location. C# programming language was used to program in Microsoft Visual C# 2008 Express Edition and also used Blender to create 3d character. This report was published by the Department of Computer Science and Engineering of Chalmers University of Technology in 2010.[4]

“Design and Development of a first person of a shooter game – MAN FROM W’71” is a game development project. The developer used Unity 3D game engine. The game main mission is to keep their country secure from Pakistani Military. They also used Blender and Maya as Object Modeling tools. Developer choose C-sharp as a programming language.[6]

### **2.3. Conclusion:**

Gaming industry is increasing day by day in the world. According to Newzoo, a gaming analytics provider, gaming market in Bangladesh was worth \$62.22 million.<sup>[7]</sup> And since then, its rising subsequently. Most of the users are the young generation of our country. it is high time since we can connect our history to the gaming zone. It will not only lure the market demand of the industry but also will play a pivotal role to enhance the cultural bond between the youth and our golden past. From that perspective, our game The Bangal Knight would soon be the pioneer in gaming development of our country.

## CHAPTER 3

### GAME OVERVIEW

#### 3.1. Game abstract:

The Bengal knight: Sonargoan is a story of medieval Bengal capital sonargoan. At that time, subcontinent was reigned by the Moughal empire. Although Moughals were the supreme ruler of the Indian subcontinent, they fell short to conquer the Bangla. It was because of the courage and dedication of some Bengal knights. They were also known as “The Baro Bhuiyan”. Among them Isa kha was the most powerful and renowned one.

The playable character in this game, known as Selim, is a close companion of Isa Kha. Through Selim’s eyes user would be able to see the medieval Bengal nature and life style of the people. User would perform daily chores of the then people through Selim. Such as hunting for food, preparing them and other activities. As a companion of Isa Kha, Selim have to be prepared for the battle as well against Mughals in the later stages of the game. Thus, it would be a great visualization of the medieval Bengal and its beauty and culture as well.

#### 3.2. Appearance:

In the game scene we tried to show a scenario where our main game character (known as Selim) is wondering in the woods for hunting as his daily task in everyday life. There are alive wild animals in the woods such as deer, rabbit, fox etc. Selim’s main objective is to hunt down deer in the first scene.

In the next scene its appearance Selim would be returning home with his hunts. On the way he has to be saved a stranger from a tiger attack. The stranger would turn out to be Isa Kha

#### 3.3. Focus point of the game:

- Wondering the wood.
- Keep distance from wild animals.
- Aiming with bow and arrow.

- Deer hunting.
- Saving stranger from tiger

### **3.4. System Requirements:**

Operational System: Windows 10

RAM: 2GB RAM.

Processor: Intel Pentium III Mobile 750MHz / AMD Athlon 64 2000+

Video Card: NVIDIA GeForce 8800 GS or Higher.

Disk Space (HD): 4 GB Free spaces.

Sound Card: DirectX-compatible.

## CHAPTER 4

### REQUIREMENT SPECIFICATION

#### 4.1. Introduction:

Requirement specification also can be referred as system requirements, are the configuration or structure that a system or a project must have in order for any hardware / software application to run smoothly and efficiently. Installation problems or performance problems may occur during operation if there are failures to meet these requirements. So, without a proper introduction to the requirement specification of the project, implementation may not achieve the goal.

Generally, for a gaming application, system requirements often indicate the minimum and the recommended configuration. The former is the most basic requirement, enough for a product to install or run, but performance is not guaranteed to be optimal. The latter ensures a smooth operation. In this section we try to enlighten the technical requirements for developing the application.

#### 4.2. Requirement Analysis:

In our game project the tools we use can be divided into two parts, software requirement and hardware requirement.

- Software requirement:
  - a) Unity 3D as Game Development Engine
  - b) Visual Studio as code script
  - c) Blender as Graphic and object modeling tool
- Hardware requirement:
  - a) High configured Desktop computer

##### 4.2.1. Game Development Engine, unity 3D

Unity is one of the world's leading platforms for game development engine. It gives the developer a user-friendly environment with powerful visual interface. Unity 3D



application has 3D environment, creating menu, animation panel, writing scripts and user can also customized layout by dragging and dropping.<sup>[3]</sup>

For developing video games Unity is a cross-platform game engine commonly used. It is also renowned for simulations for PC, consoles, mobile devices and websites. It supports Java Scripts, C # as scripting language.

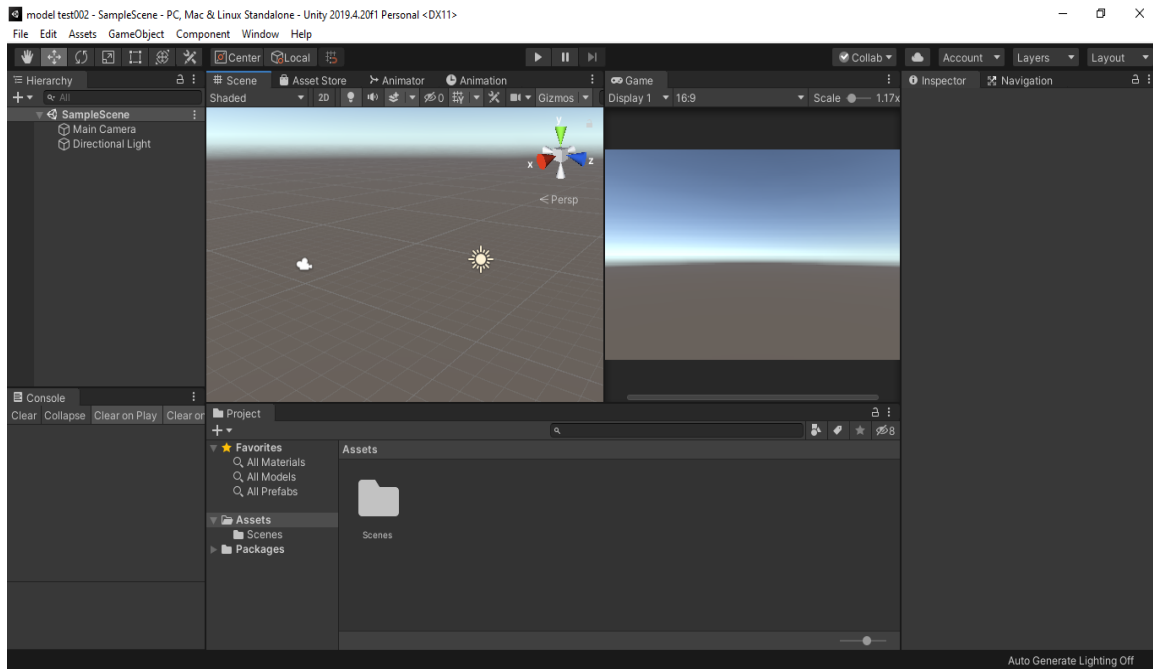


Figure 4.1: Default Unity view

#### 4.2.2. Visual Studio

Visual studio is IDE made by Microsoft and it used for different computer program, website and also mobile app. We will use it as our game scripts IDE. Visual studio is written in C++, JavaScript, HTML/CSS/XHTML, C# and others but in game development we will use C# as our programming language.

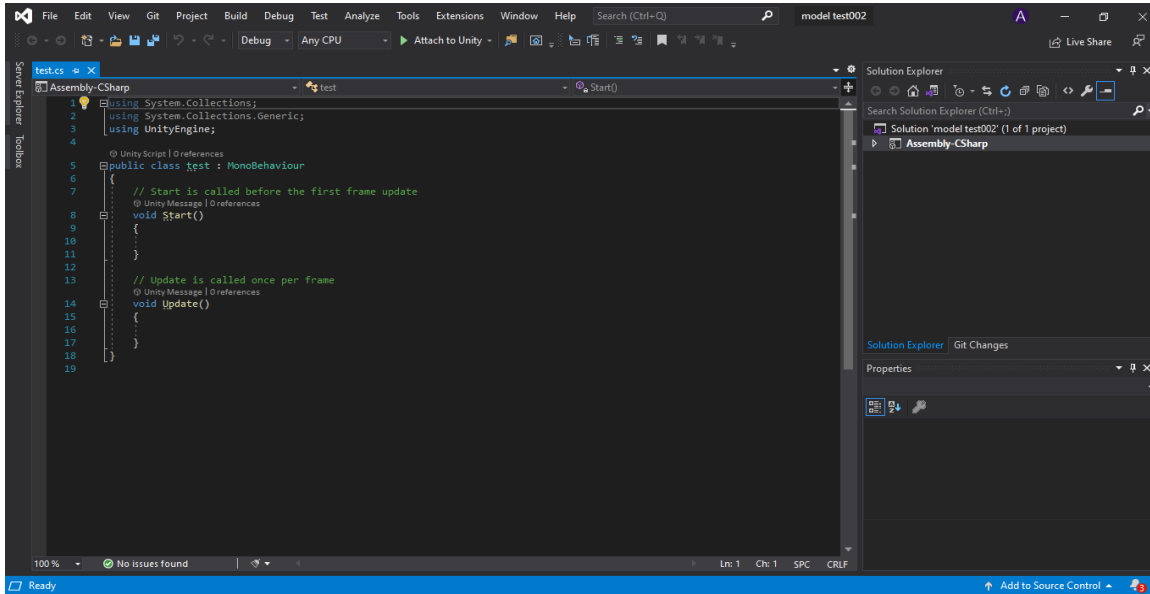


Figure 4.2: Visual Studio Default View

### 4.2.3. Blender

We use blender to create our game models, rigged and animated the models. Blender is open-source 3D creation suite and its totally free for everyone. It supports the entirety of the 3D pipeline—modeling, rigging, animation, simulation, rendering, compositing and motion tracking, even video editing and game creation.<sup>[1]</sup>

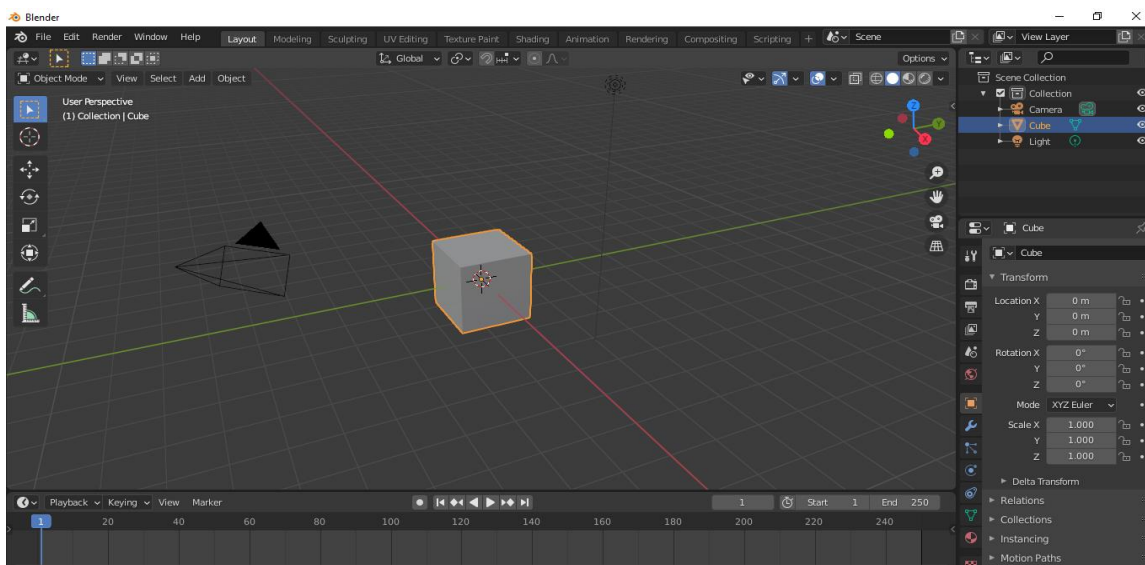


Figure 4.3: Blender Default View

## CHAPTER 5

### DESIGN AND DEVELOPMENT

The whole game creation mainly depends on the planning which can also be referred as the design and development procedure. In this chapter, we have depicted how we have designed the games assets and different interfaces and how they fit into the system as a whole.

#### 5.1. Architecture Design:

The key features of the game and the game flow are presented in the flow charts.

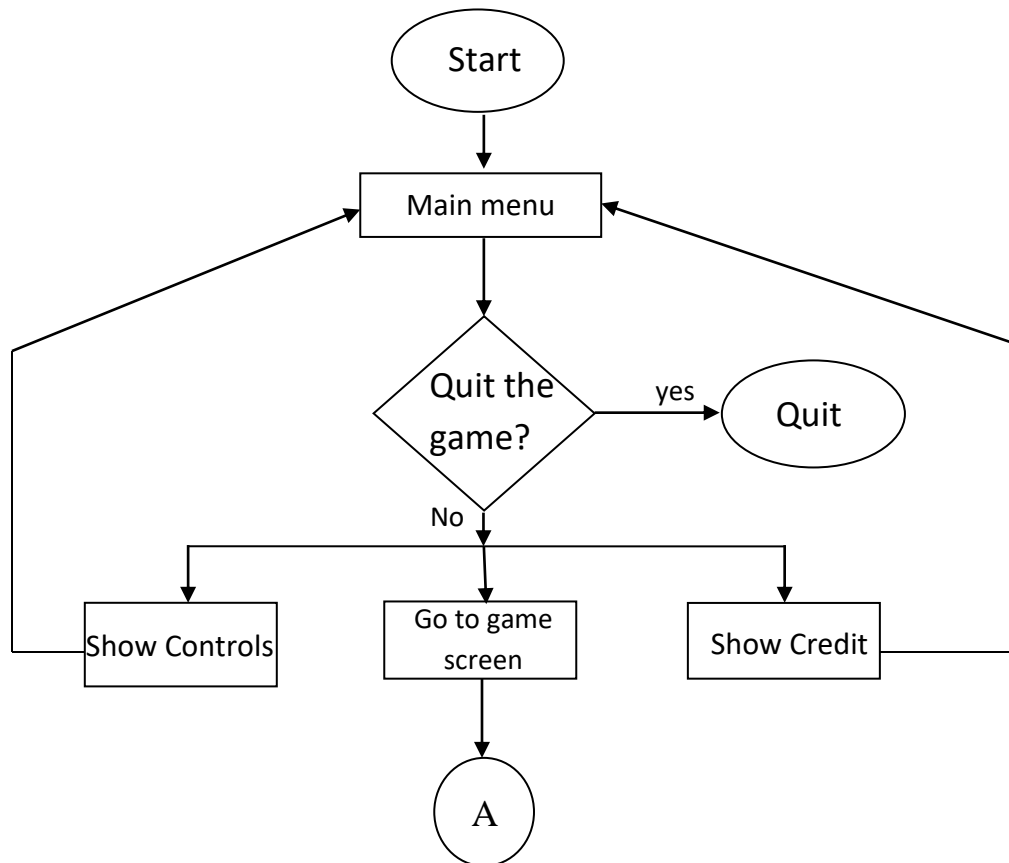


Figure 5.1.1: Game main flow

**Game flow:** The following figure 5.1.2 shows the game flow process

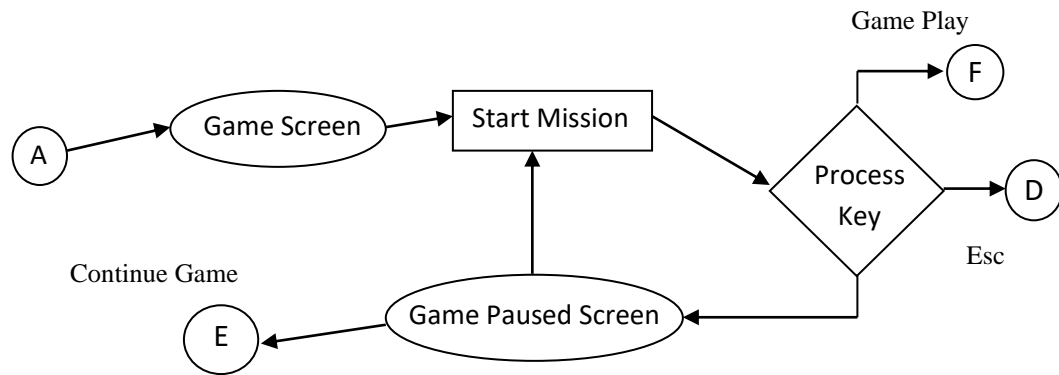


Figure 5.1.2: Game flow

The following figure 5.1.3 shows the game flow (continue) process.

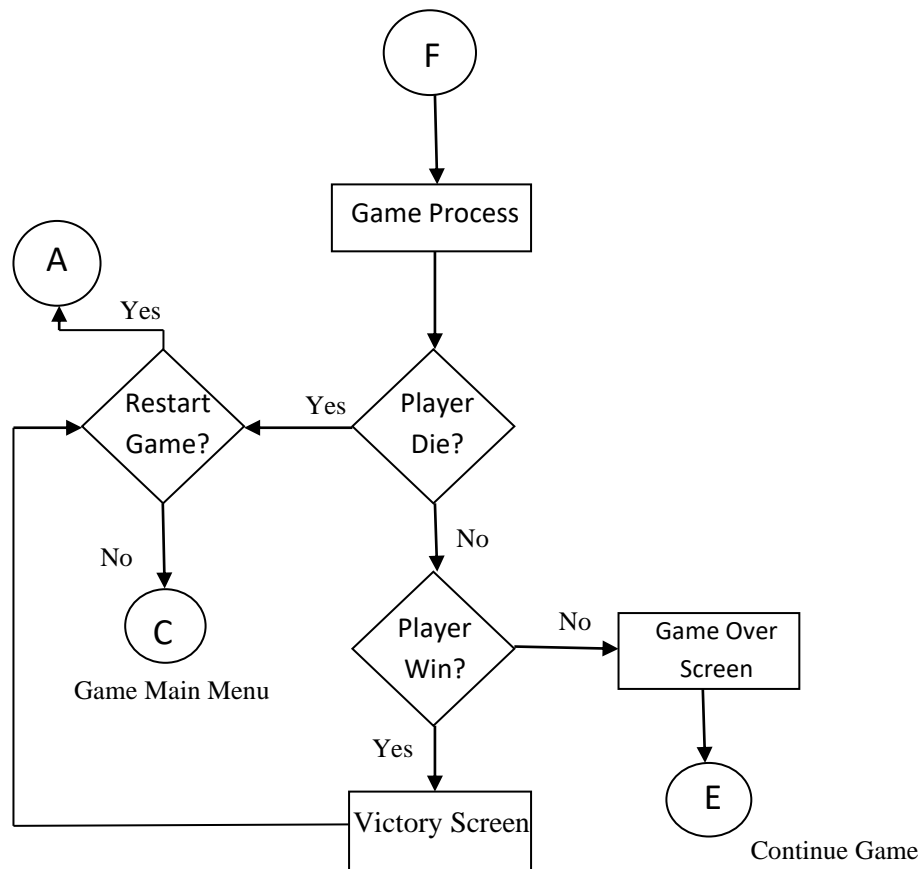


Figure 5.1.3: Game flow (Continue)

**Mission Objectives:** The following figure 5.2 shows the game mission objective

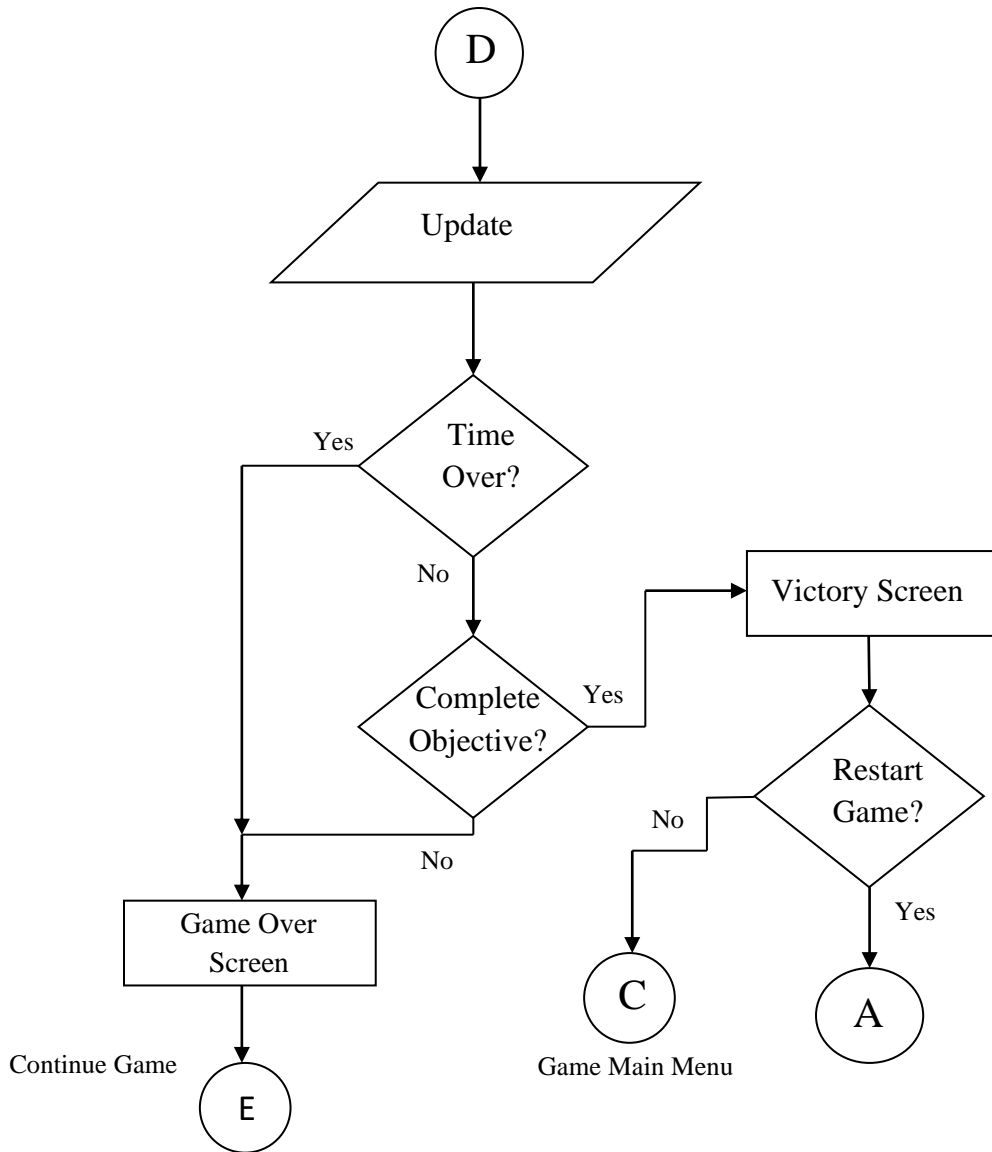


Figure 5.2: Mission Objective

## 5.2. Environment Design:

For creating our game assets Blender has been used as model design. We have also created some animation to the game model using blender. For development we have used unity 3D with C# scripting language. Different type of trees, Wild animal like Rabbit, Deer and fox and also some different kinds of bushes have been made with blender.

**Game character “Selim”:** The figure 5.3 showing modeling of game character.



Figure 5.3: Game character modeling

**Wild Animal:** Figure 5.4.1 showing modeling of deer (without texture).

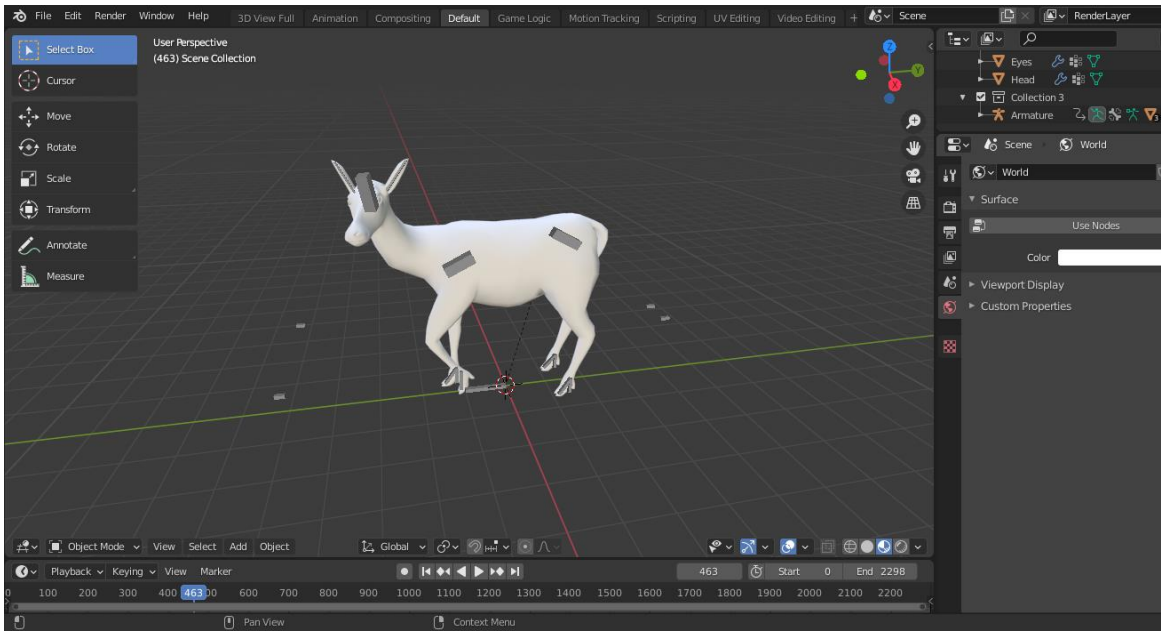


Figure 5.4.1: Deer modeling

Figure 5.4.2 showing modeling of fox (without texture).

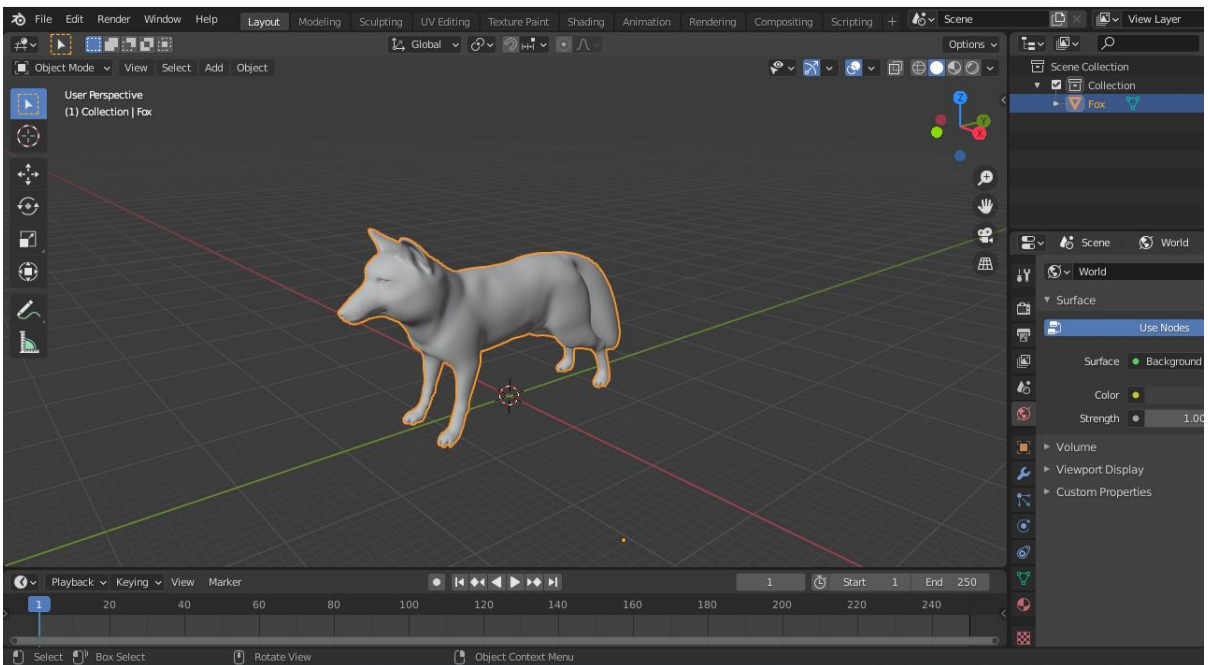


Figure 5.4.2: fox modeling

**Game Environment:** The figure 5.5.1 is showing the modeling of trees.

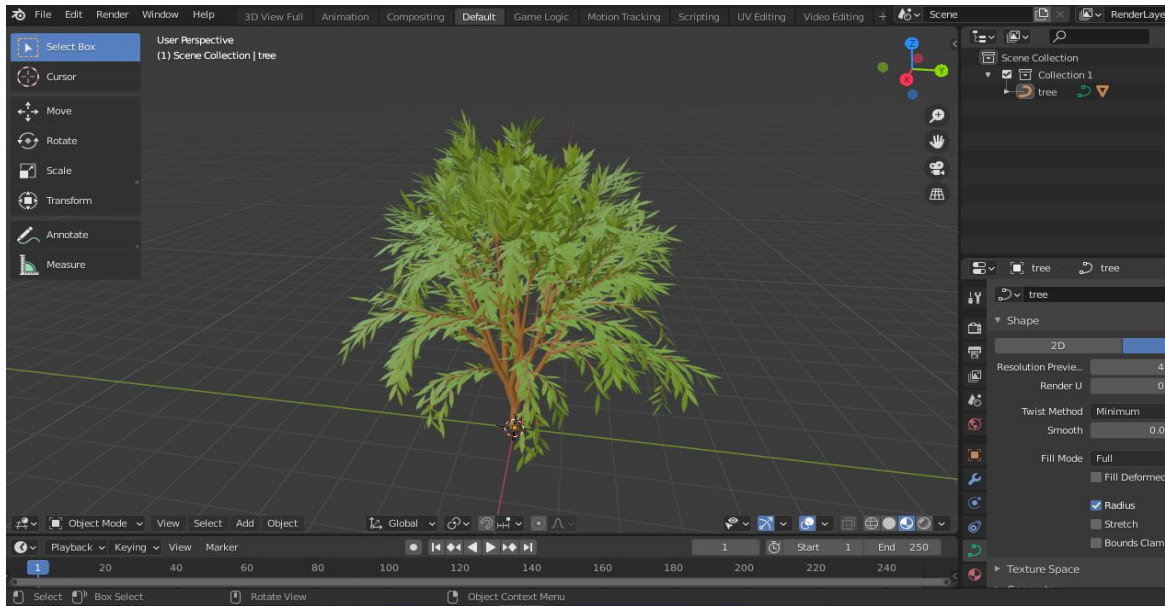


Figure 5.5.1: Environment modeling (bush).

Figure 5.5.2 is showing modeling of another types of trees.

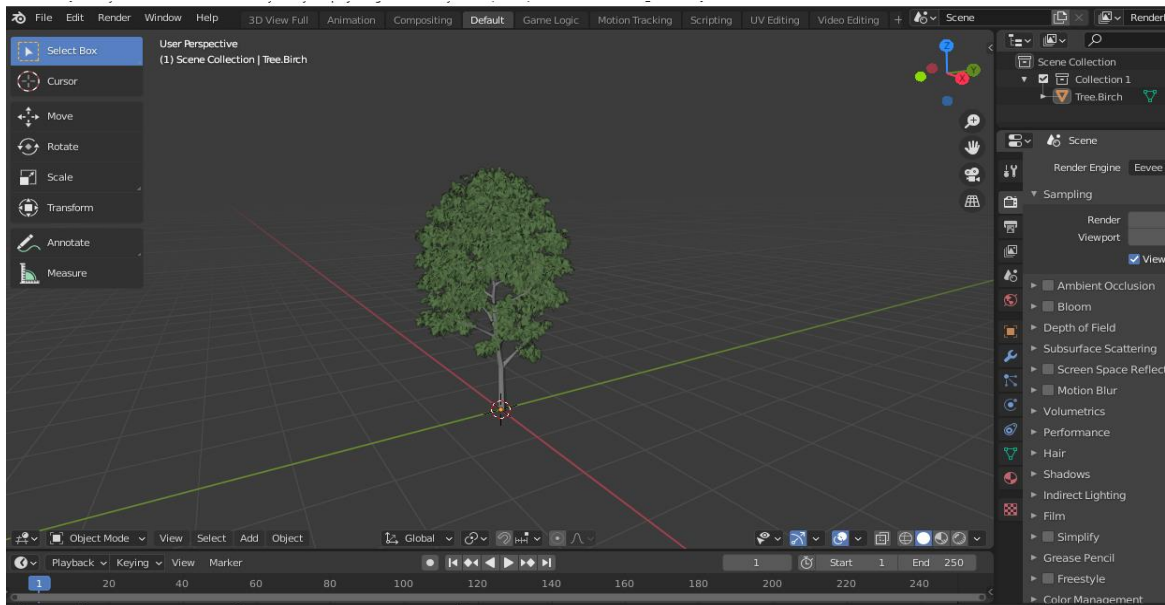


Figure 5.5.2: Environment modeling (tree)



### 5.3. Design and Development:

"THE BENGAL KNIGHT: SONARGAON " is a third person perspective game. so, the interaction with the game environment would be more in focus than other. The design and development process that has been followed in developing the game project:

- Creating the game model using blender
- Applying texture map in the model
- Create basic animation
- Scene creation with the help of Unity Engine
- With scripting language C Sharp, we set the behavior of game objects.
- AI of wild animals' behavior.

**Trainee:** Figure 5.6 is showing the game trainee creation.

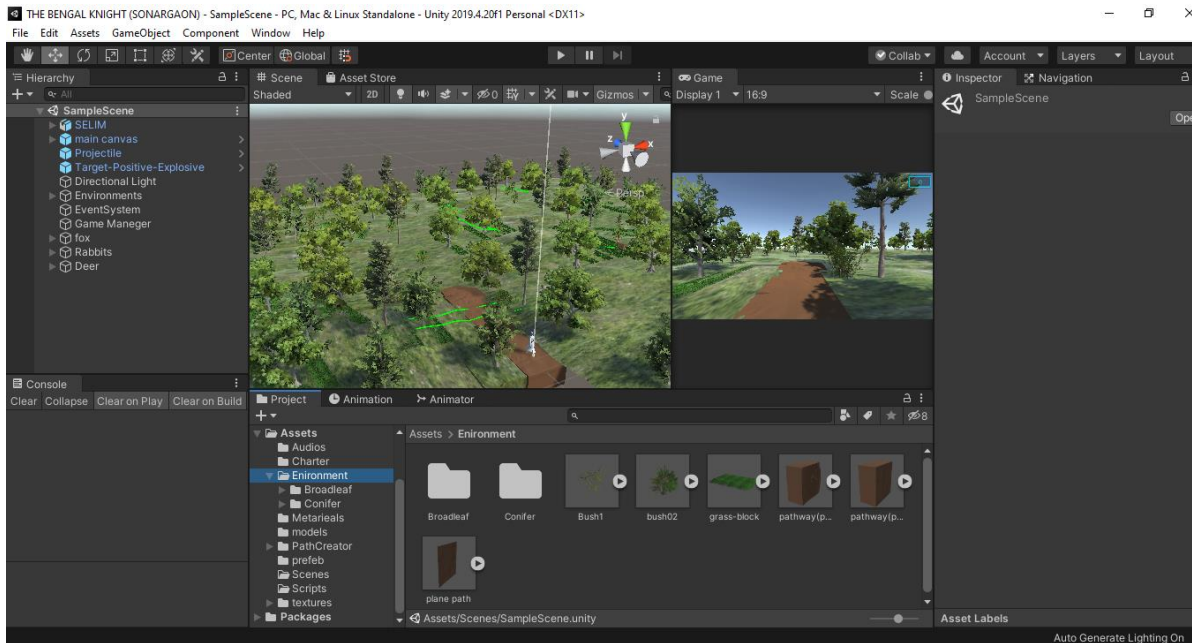


Figure 5.6: Trainee Creation

The game texture creation is portrayed in figure 5.7

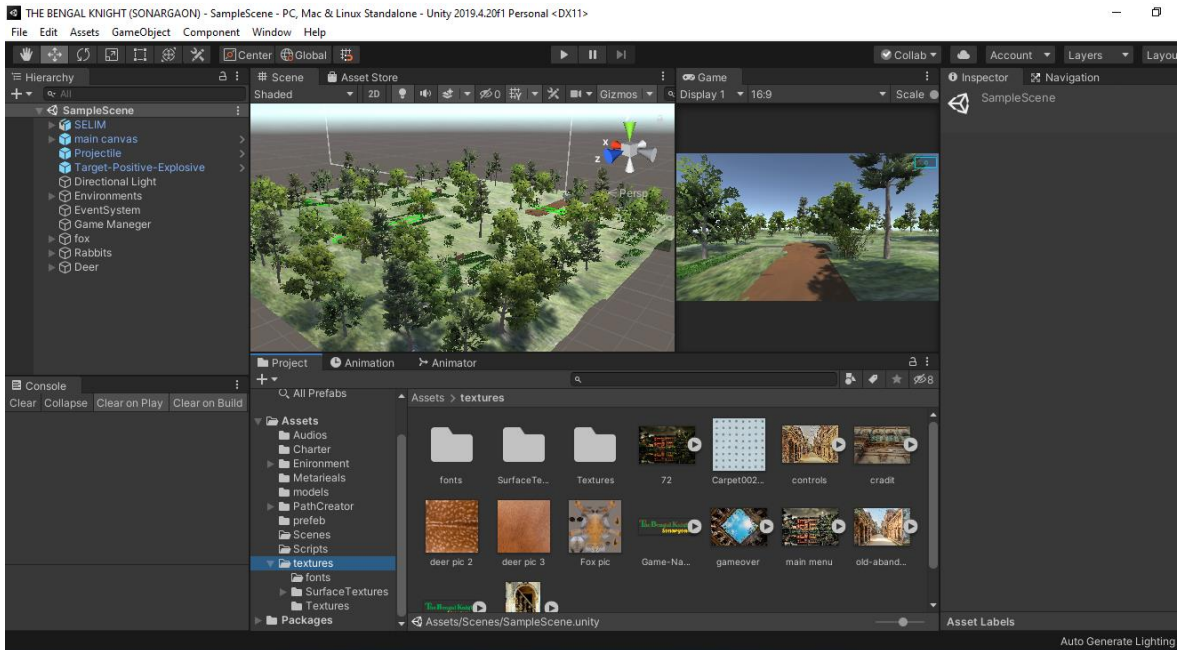


Figure 5.7: Texturing on Objects

#### 5.4. User Interface Design:

We have tried to develop user friendly and common gaming user interface. We have followed the commonly used interface for developing a third person perspective. Which will comfort the users while gaming. At first the game menu screen will be presented and from there the user can go to other game screen using the button functions. When the user will press the “Play” button, he/she will enter into the game level and the game will start.

##### ❖ Some key images:

The main menu screen is shown in figure 5.8.1

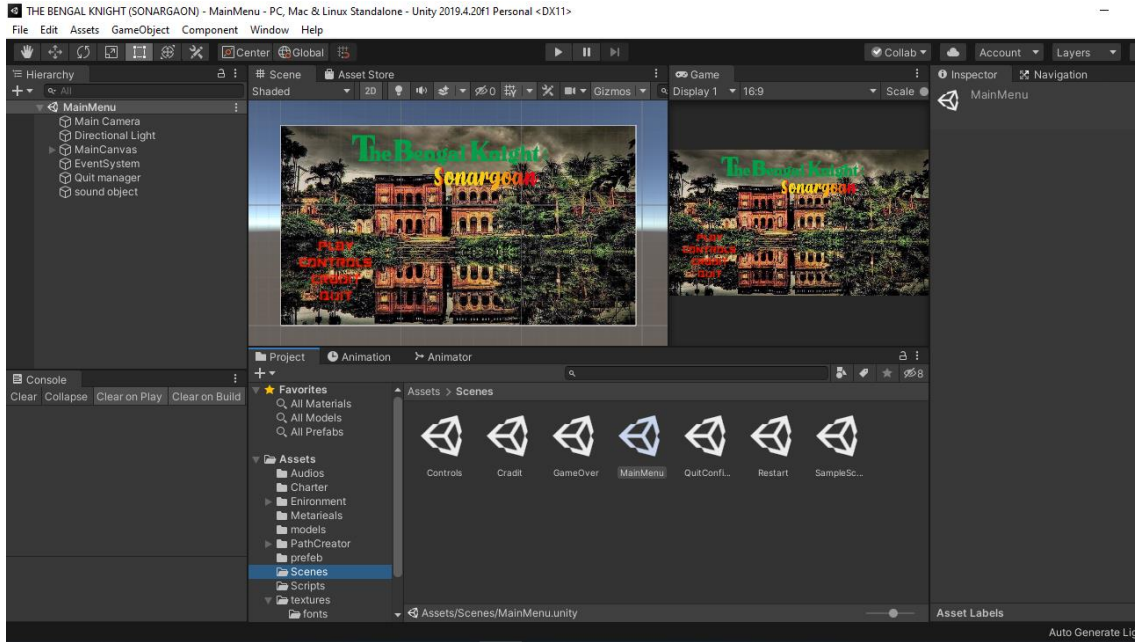


Figure 5.8.1: Game main menu creation

- **The control menu:** the control menu from the game is shown in figure 5.8.2.

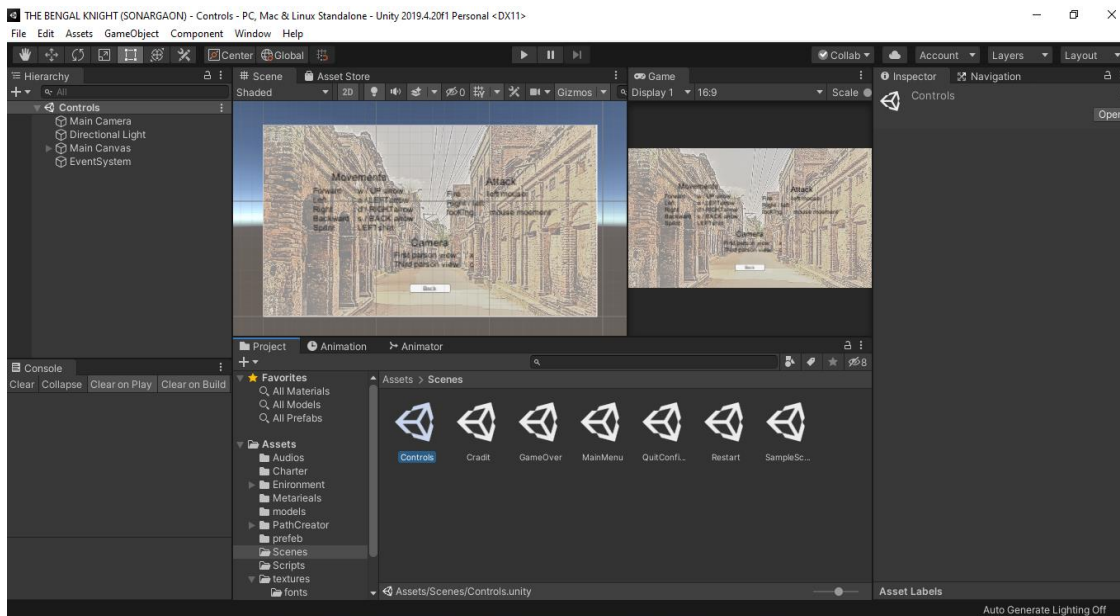


Figure 5.8.2: Game control menu

- **Game screen:** The default game play screen is presented in figure 5.8.3



Figure 5.8.3: Game play scene

### 5.5. Game controls:

In our game we used common and user-friendly controller to control the game character.

Player normal movement (default):

- Forward: W
- Left: A
- Backward: S
- Right: D
- Moving the mouse point: Look.
- Fire: Mouse Left Button.
- First person view: x
- Third person view: c

## CHAPTER 6

### IMPLEMENTATION AND TESTING

In this section we have shown all the game assets and how they have been made and implemented in the game. In the latter part of the section, we have described the testing procedure whether the game is running smoothly or not.

#### 6.1. Implementation

No project is viable without proper implementation of the assets and tools. Different game assets, levels and GUIs that are used in this project are described in this part.

##### 6.1.1. Collection and Design of Game Assets:

The game assets contain of 3D model, texture, music, prefab, scripts etc. These assets used to make the game object. In unity we have used the game object to create the game scene. Game objects are the most essential part of developing a game. Every game object must have a script is attached to that which depicts the behavior of the game.

In the whole game development process, we spend a lot of time to create our game assets. We have tried Adobe Illustrator and adobe Photoshop to create and modify our texture. Blender has been used for creating our main game character and also other 3D game object. For scripting we have worked with visual studio.

1. Character development:

Blender, a free open-source 3D creation suite is used to create our main game character (Selim). We also have created some basic animation function like idle, walk, run, attack. There are few controller scripts to control our character. There are also some wild animals in our game. The 3D models of the wild animals have also created through Blender and Scripts in C# language.

2. Terrain Assets:

our game scene contains a forest. so, we have made some separate trees, bush, grass, bumpy surface etc. we have tried to match the assets to be similar to the medieval time specially in Sonargaon region.



### 6.1.2. Construction of Game Level:

A game level is a fraction of the whole game. Usually, a game is large enough so developer has to part the game in different scenes. This provides the player better gaming experience. A gamer needs to do some specific tasks to complete in each level.

In this game we used unity a user-friendly game development engine to construct our game environment. Our game level consists of wild animal like deer, rabbit, fox etc. In The environment there are different kind of tress. We have created the 3d model using blender. We have also used code for the behavior of the tress. Then import in our game Engine. We have used some textures for the bumpy surface to give real life view.

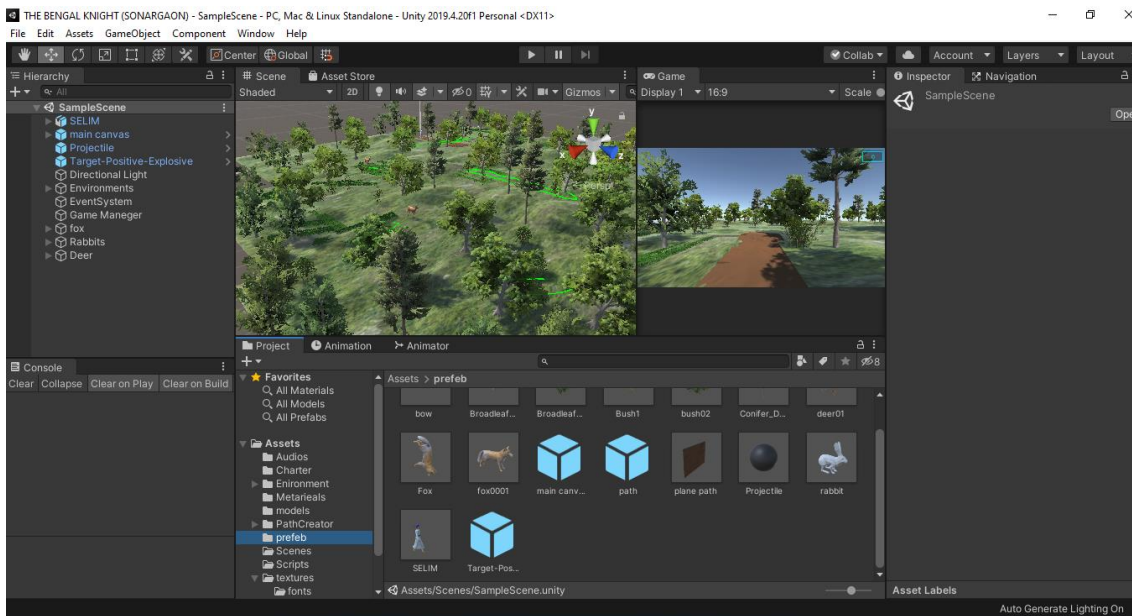


Figure 6.1: Gaming level creation.

Other game objects are also made in blender then are used it in unity Engine. Through visual studio we have coded the game behavior for every game objects.

### 6.1.3. Fundamental Features:

In game we have introduced two ways to create our game object. Game developer can create game object like Sphere, camera etc. in unity Engine. We have used it to create game camera. We also have used prefabs for creating same game object repeatedly. Our target object has also animation attached with it. In main game character basic animation like walk, idle and run are controlled with animation controller. Animation controller is a feature of Unity that helps the developer for easy control of the animation.

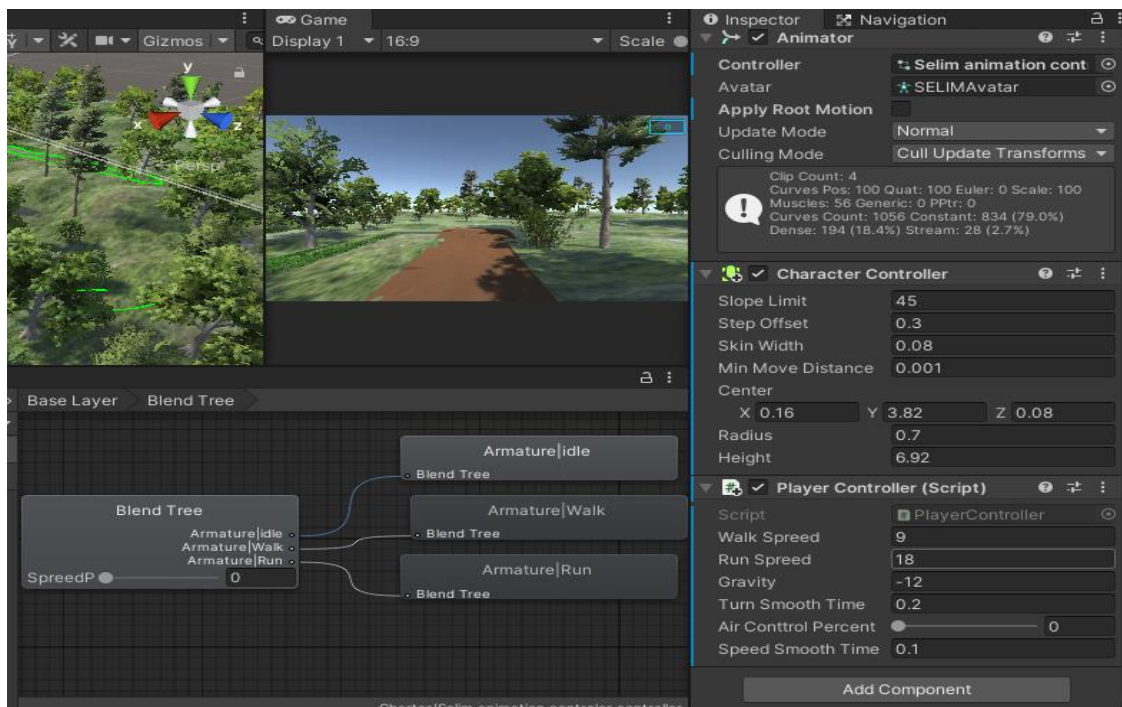


Figure 6.2: Selim animation controller

Another important feature of the game is the scoreboard. We have used unity UI interface to create the scoreboard of the game. We handle our score function in “Game Manager” script. The player can observe the scoreboard at the top right corner in the game screen.



Figure 6.3: Game scoreboard (top right corner)

#### 6.1.4. GUI of Game Start:

GUI (Graphical User Interface) is an interface that allows user to interact through graphic elements. It is an important part of our game. We have tried to make our GUI simple and user-friendly. In this game we have 2D GUI. In the starting GUI there are some button functions that are used to take player into main gameplay or to another GUI. The background consists of pictures, a few texture texts, some click-able buttons and background music. It also has a script for its behavior.

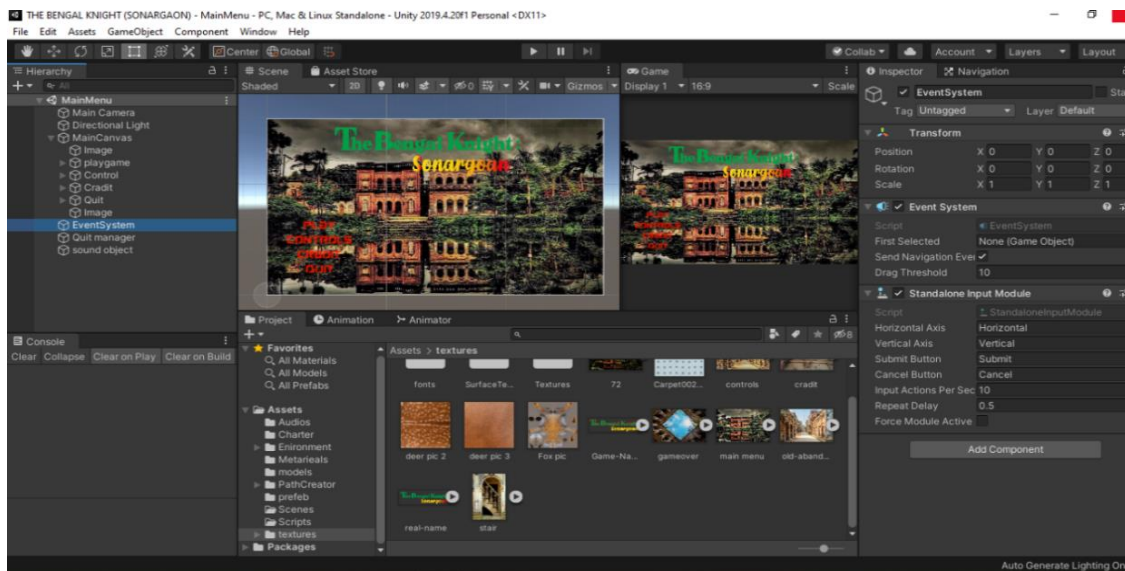


Figure 6.4: Starting menu GUI (development mode)



In starting GUI there are four functional buttons. The play button will start the game. Though Controls button the player can go to controls GUI. Credit button will lead to another GUI that contains the detail of game developer. There is also an end game function to exit the game. All the button functions are handled with scripts.

## **6.2. Testing:**

Game testing is one of the crucial steps that help to ensure optimal performance and quality of any game development project.

### **6.2.1. Testing Methodology**

Generally, it is a software testing process for testing video games for quality control. The main goal of game testing is

- to identify and
- to troubleshoot defects and bugs

in a video game and improve the stability and performance.

The configurations of the tester machine were as follows:

#### Developer's Desktop:

Windows Edition:	Windows 10 Pro
Processor:	Intel(R) Core(TM) i3-7100 CPU @ 3.90GHz
Random Access Memory (RAM):	16 Gb
System Type:	64-bit operating system,

#### Testing Desktop:

Windows Edition:	Windows 10 pro
Processor:	Intel(R) Core(TM) i5-5300 CPU @ 2.30GHz
Random Access Memory (RAM):	8 Gb
System Type:	64-bit operating system,

### 6.2.2. Testing criteria and evaluation:

There are no standard criteria based on a game can be evaluated. Its solely depend on developer and the system that is to be tested. We have tried to follow a general trend of testing the game. Based on which criteria e have tested the software and the result we have found so far are discussed in this section.

#### ❖ Satisfying requirement specifications:

Every project must have functional or non-functional requirement. Our test will be satisfactory after completing all the requirements with positive results. It contains all necessary requirements for project development. Besides it runs properly if the system requirements are made.

#### ❖ Functional testing:

Functional testing finds the general problem within the game or its user interface and graphics. It can include –

- asset integrity,
- stability issues,
- audio-visual issues, and
- game mechanic issues.

Only then the game can be perfectly working. When we have tested the Bengal Knight it runs perfectly without any major functional problems. But sometimes when we have tested the gameplay, one of the functions that is switching first person perspective to third person, often caused a little error.

#### ❖ Compatibility and integrity:

Compatibility testing is to check whether the game is suited for the devices it is made. The Bengal knight is a PC game. It is compatible with Windows and Linux operating system.

❖ GUI friendliness:

If a game is not user friendly, no one will be attracted to play. And so, a vital challenge for a game developer is to make the game user friendly. User friendly does not necessary means it ought to be fancy or rococo in interface. Rather than to be presentable the game in a very simple and common interface. In our game we used the interface that is commonly used in most of the open world game. Besides we introduced notification and button functions to guide the new users.

**6.2.3. Unit testing:**

Unit testing is usually done by the developer in the development stage. Mainly unit test is used to find error or bug in game project. It isolates a part of the code and tests its correctness. In this project we have used Black Box test system to verify each part of the project and find the bug and tried to fixed it. It is very efficient for testing the small project like “The Bengal Knight”.

During program testing we faced two kinds of error like syntax error and logical error. Syntax error occurs in source code in the program. In our project we have tried to solve our syntax error so that our game work properly. We have also identified a logical error in pointing the game character and successfully correct the error.

## **CHAPTER 7**

### **CONCLUSION**

#### **7.1. Conclusion**

After all a game is made for entertainment and fun. Open world games are a lot of fun to play. User can roam freely and become creative. Besides, when local culture and history are mixed with it, the game becomes more enjoyable. The Bengal Knight is a mirror of our past myth, the “Baro Bhuiyan”. Although the game offers a level to play, People would get attached to the medieval era of our history while playing it. Its just a process to revive our past and make them alive to our younger generation. Moreover, as a developer, this game introduces us to a huge opportunity lies ahead of us. Now we have become more experienced and compatible with Unity engine. Although it’s a small step for us, it paves the way of a big leap in the future.

#### **7.2. Limitation:**

Every project naturally has some shortcomings of its own. Ours in no exception.

- i. Generally, a game development project is a huge project where a lot of manpower is required. As such, the group member for the project was inadequate. It’s the hindrance of our performance and quality as we expected
- ii. It was the very first game development project for the us. So, lack of experience sometimes caused trouble.
- iii. In Bangladesh perspective game development project is a rare occasion. we could not get enough resources when needed.
- iv. Game development is a very time-consuming project. The project timeline was not enough to get the best result that we expected.
- v. The Bengal Knight is a long project. But we were able to develop only one level for the user. Further work is required for the development of the whole game.

### **7.3. Future work:**

In future we want to add more stories for further developing the game. We also want to make it more realistic using story cutscene and graphical visualization. Our plan is to create a franchise base game as the sequel of it. Beside there is an intention of

- Creating an android version of the game when the game is fully developed.
- Creating a sequel named “The Bengal Knight: Inidigo revolt” as a sequel to revive another legendary Bengal knight, the Biswas brothers from our history.

## REFERENCE

- [1] Blender official website, available at <<<https://www.blender.org>>>; last accessed on 20-06-2021 at 9 PM.
- [2] Unity user manual Guide (2020.3), available at <<<https://docs.unity3d.com/Manual/index.html>>>; last accessed on 15-07-2021 at 2 PM
- [3] Unity3D real time development platform, available at <<<https://unity3d.com>>>; last accessed on 23-07-2021 at 7 PM
- [4] Hatice Ezgi TUĞLU and Kahraman AKYIL, Design and implementation of a single-player first-person shooter game using XNA game development studio, a report from Chalmers University of Technology, Göteborg, Sweden, October 2010
- [5] Peng Xia, 3D Game Development with Unity A Case Study: A First-Person Shooter (FPS) Game, thesis from Metropolia University of Applied Sciences, Helsinki, Finland, February 2014, available at <<<http://urn.fi/URN:NBN:fi:amk-201403203326>>>; last accessed on 28-01-2021 at 9 PM
- [6] Shahadat Hossain and Sohana Mehbuba, Design and Development of a First Person Shooter Game: Man From W'71, a report from Daffodil International University, Dhaka, Bangladesh, May 2018, available at <<<http://dspace.daffodilvarsity.edu.bd:8080/bitstream/handle/20.500.11948/2639/142-15-4039.pdf?sequence=2&isAllowed=y>>>
- [7] The Daily Star- Gaming industry begins to bud, available at <<<https://www.thedailystar.net/business/news/gaming-industry-begins-bud-2017909>>>; last accessed on 02-07-2021 at 2 PM
- [8] Cavallari, B, Hedberg, J and Harper, B., Adventure games in education: a review, Australian Journal of Educational Technology, Vol 8 No. 2, pp. 172-174, December, 1992.

# APPENDIX

## Appendix A: GUI design

Main menu interface:

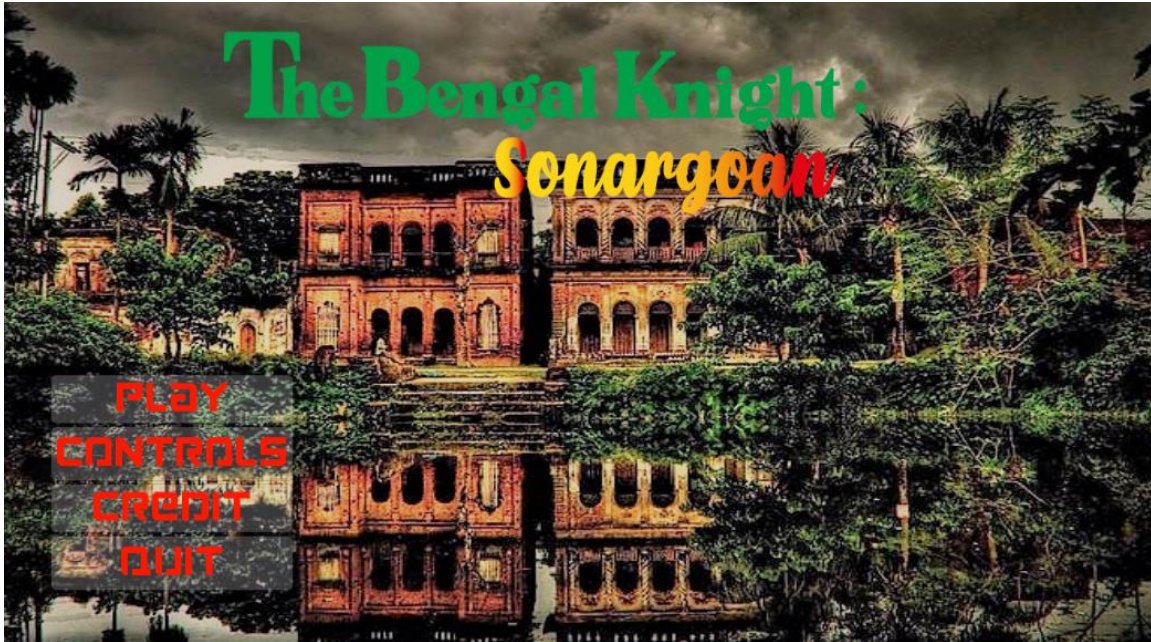


Figure A.1: Main menu

Control interface:

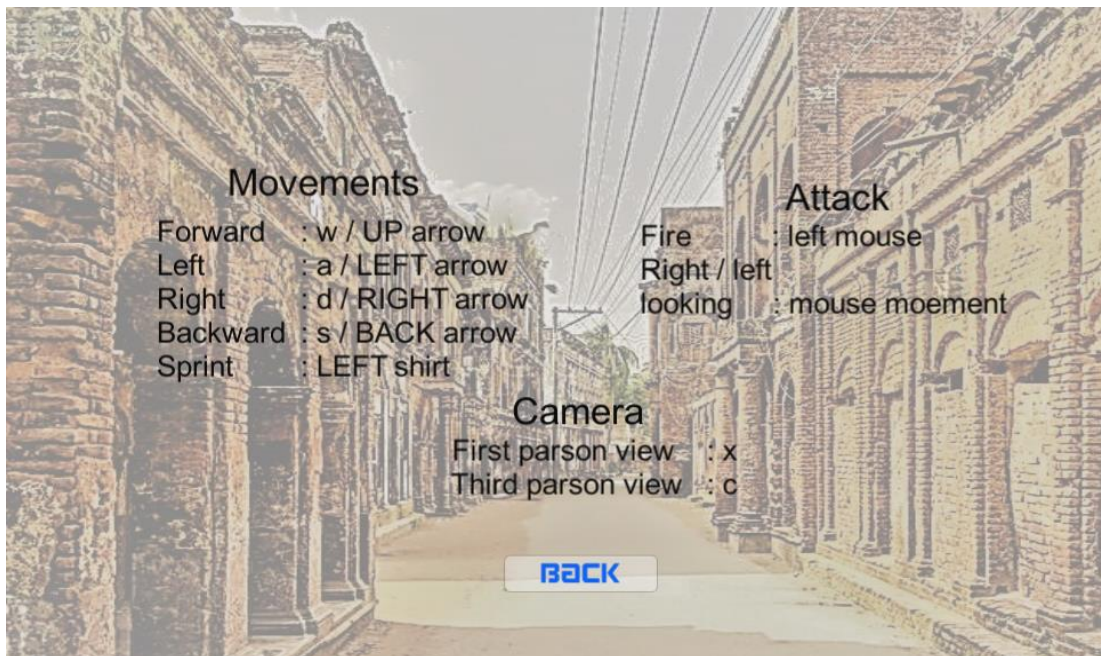


Figure A.2: Control's interface



Credit interface:

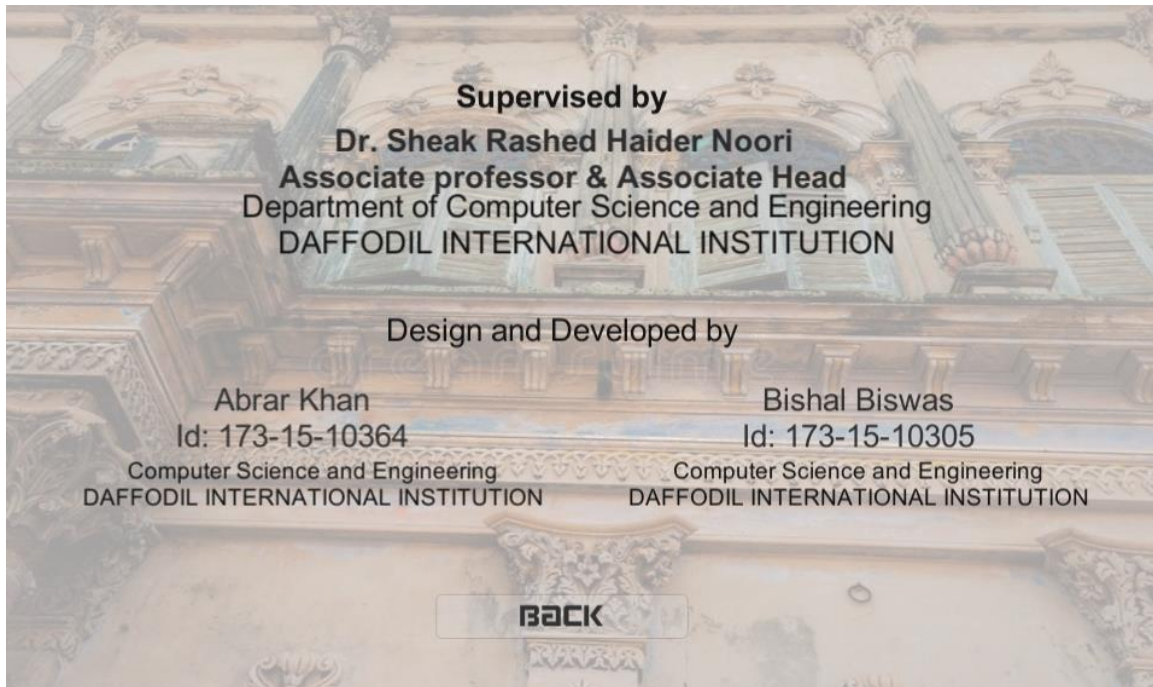


Figure A.3: Game credit interface

Game Environment:



Figure A.4: Game play interface



Game environment:



Figure A.5: Another gameplay interface

Level completed interface:



Figure A.5: Level complete interface

Game over interface:



Figure A.6: Game over interface

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