

**FINAL YEAR PROJECT
AGENT-71: BANGLADESH ARCHEOLOGY**

By

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This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Multimedia and Creative Technology

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APPROVAL

This project titled “**Agent-71: RPG action game**”, submitted by Sazzad Bin Sattar to the department of Multimedia and Creative Technology, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements of the degree of B.Sc. in Multimedia and Creative Technology and approved as to its style and contents. The presentation has been held on **26th December, 2019.**

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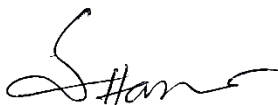
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I here declare that, this project has been done by me under the supervision of Md Salah Uddin, Lecturer, Department of MCT. I also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

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ABSTRACT

A PC game, also known as a computer game or personal computer game, is a type of video game played on a personal computer rather than a video game console or arcade machine. Its defining characteristics include: more diverse and user-determined gaming hardware and software; and generally greater capacity in input, processing, video and audio output. The uncoordinated nature of the PC game market, and now its lack of physical media, make precisely assessing its size difficult[1]. Nowadays specially students are building gaming PC for playing high quality games instead of buying normal PC. In future RPG Action game will stand the top rank along with shooter game. Because gamers are now enjoying roll playing game, where each roll playing game consist strategy, action, racing etc. That's why gamers are attracted more and more. In Bangladesh the pc gaming industry is low, and there are a few games developed. Moreover, there a very little amount of games whose are based on our national culture or history. I developed this open world game which is based on our national archeological sectors & history. I start developed "Agent-71" game in UNITY game engine, where I using C# programming language. I developed required 3d model on Autodesk 3ds Max, Maya, Zbrush. In this project I introduced Bangladesh National Museum as one of my game maps. I start developing the required model for my gamed project where I used some material like museum environment by using 3d software MAX & MAYA. Moreover, I also use Zbrush software for developing my main character who will be playing the main role as agent-71. All the thing is depends on our country & the tradition. There also used some graphic design software Adobe Photoshop & illustrator for creating level layout & texture design. Nowadays pc's availability is rising rapidly in our country, specially students they prefer use computer for study & entertainment by playing video games.

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LIST OF ABBREVIATION

3D: Three Dimensional
RPG: Role Playing Game
FBX: Proprietary File Format

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CHAPTER 1

INTRODUCTION

1.1 Background

Home computer games became popular following the video game crash of 1983, leading to the era of the "bedroom coder". In the 1990s, PC games lost mass-market traction to console games, before enjoying a resurgence in the mid-2000s through digital distribution. [1]

The proposed project will design and develop a game for introducing Bangladesh archaeological things and policy studies to support decision-making, communication, public engagement and tourism.

This game will be based on Bangladesh archeological things & place. Now a day's video games are most popular entertainment to the young generation & children. In this game I will design the levels based on some archeological place like Mainamoti, Lalbagh Fort & National Museum.

In this country there are no PC games developed based on our country's archeology.

“Agent-71: Bangladesh Archeological things Finder” this game will be a third person RPG action game. The user will control a character called “Agent-71” is a special investigator. Players have to find the stolen expensive archeological things & fight with the robber.

Any people who already played games in computer, they can play this game. But I will develop this specially for the future generation. Because at present the young generation are mostly attached with technology & many of them still don't know much about Bangladeshi Archeology. So, I believe that this game will be taken a valuable part about to introduce our archeology to the future generation.

1.2 Motivation

There is an android game developed based on freedom fighters of Bangladesh liberation war 1971, which called “Heroes of 71”. This game is a third person action game.

It was downloaded 7,209 times in the first few hours of its release on the Google Play Store. Developers Port-bliss say the game is designed to ‘portray the battles’ between the Mukti Bahini and the Pakistani occupation force (Ashib Hussain, 2015).



Figure 1.1: Heroes of 71 game

Except this android game there are another RPG computer game developing based on our country traditional culture called “**Aguntok**”. This game is developed by M7 Productions & Attrito. It also called roll playing open world game which is kind of like the world-famous game’s series Grand Theft Auto. This is the only one big game developed in our country with in Bengali for pc. That is a legendary revaluation in Bangladesh video games industry.



Figure 1.2: Aguntok game

1.3 Objectives

New generation are totally depending on digital entrainments like video games. So, I decide to develop a game based on Bangladesh Archeology place. Where player will get action adventure

feelings with learn & watch the area of our beautiful archeology. There I will use first map National Museum. Where every map will have different mission. The main concept is there will be a robber teams who stole the most valuable materials from those places. Player need to fight with them & investigate the place to find the stolen materials which can be a bust, stone, jewelry etc.

I choose to first collects enough information of those archeological place then develop 3D model of them with using 3D software like Max, Maya. I will also model the main character & others in Zbrush software which is based on our native culture. For developing the game, I prefer to use Unity software with using C# language as back-end code. There also can be use other programming language like C++, Java Script, Python and so on.

I main map I prefer was National Museum, which is the our central museum. When I visited their I examined all the thing outside & inside the museum. I need to find the valuable materials that founded in our country. I saw every section & the rooms, some of are scenery some are crafts by using wood, leaf, bamboo etc.

In a room of the museum I saw a 40ft whale skeleton, which founded in our country. This whale skeleton can be sell up to 5,000\$. There are also a lot of fossils, bust & sculptures which are also be more expansive as our national property.



Figure 1.3: Bangladesh National Museum

For generating the ideas into design element first I use Autodesk Maya & Max for my models. After that I also use Zbrush sculpting software for character where I made a layout about my character models like main player, enemy & enemy boss. I made the blueprint of Bangladesh National Museum's architectural plan, for developing the model. I use Unity game engine for developing the game & using C# as the programming language. I focused on the environment specially because this thing should be matched with our culture & tradition.

CHAPTER 2

RESEARCH

For developing this game, I needed to research the archeological are in real to observe the architecture view & the property they consist. In this project I developed one map which is based on Bangladesh National Museum. There I also needed to design the main characters.

I often visited several times in the national museum to observe everything of museum for developing my level design. I choose to develop this game which can played in low range Computer for getting more player to play this game. I have a few knowledge about programming because I didn't learn this thing the only thing I know is the game design mechanism. The previous semester I developed a pc game where I use a little amount of coding but I give my hundred parchantage knowledge which was a very successful project as a beginning level.

In this way, before I bounce into my creation procedure, I attempted to comprehend the prerequisites I need to satisfy and how am I ought to do that. I needed to deal with a rundown of programming's and specialized needs which are required to assemble this item.

Models:

- Building exterior
- Interior
- Environment
- Character

I need create the blue print & architectural plan of the main building model National Museum. Where I made a practical observation of the place by visiting their. I prefer to find enough resource about the museum from internet also. I started the modeling process by using Max, Maya 3d software. I plan to design the character model which will look like Bengali people, that's why I chooszbrush sculpting software to design my estimated model. For environment materials I choose to use Unity game assets file for tree, plants and so on.

RPG Shooting Game:

- Materials
- Battleground
- Elements

Shooting games are one of the most popular genre in our world. I learned how to set up the battle fields, where player can fight with a dynamic weather & special effect like fire effect, blood effect, movement effect, animation etc.

3rd Person Perspective:

- Third Person walkthrough

I choose to develop third person shooter game, I need to learned from unity knowledge how to develop a third person shooter game mainly the third person perspective. However, I also learned how a third person game character should be setup by using C# Programming Language.

Story & Level Building:

- Story based game
- Design different levels

I need to develop a story for gameplay where the player will play the character as the main character call “Agent-71”. For level designing plan I use unity material & techniques for play, home, start, exit and so on.

Platform:

- Pc Games (Windows, Mac, Linux)

I researched that I should develop the game for computer but consider low range computer because the number of people who play games their computers are not high configured mostly.

I also design the blueprint that I included to my game and made a story for my game. I also use many other props like residential & weapons for fighting with enemy.

CHAPTER 3

WORKFLOW

3.1 Story Building

At first, I wrote a story for my game project where a dangerous robber team attack on our National museum. They stole many valuable things like and the expansive 40ft Whale skeleton. After that tragedy Bangladesh government hand over this case to the most experiences investigator name is “Agent-71”.

He then investigates the museum to find out the trail of the robbers. After that he finally reach the main place where the criminal lives. He fights with them and retrieved those material who is museum property.

3.2 Modeling Process

I use 3ds Max for developing the National museum model by creating a blueprint & layout. I made this by collecting enough architectural resource. Whether I design the layout by using illustrator & photoshop.



Figure 3.1: Museum plan

After design the 2D layout of Museum architecture plan I used Autodesk 3Ds Max software for transform it into three dimension model. I use line tool to draw the layout from the blueprint which I made before. I use Zbrush sculpting software to model my main character & other

enemy character. I also developed other objects model on 3ds Max & Maya software, before implement to Unity as “.fbx” format file. Zbrush is best for developing game character with extreme details.



Figure 3.2: Museum 3D Plan

After developing the zbrush character I need transform the character model into lowpoly model by using Autodesk Maya software. Because Zbrush model are extremely high poly model for Game asset. I made retopology technique for made this model into lowpoly model.

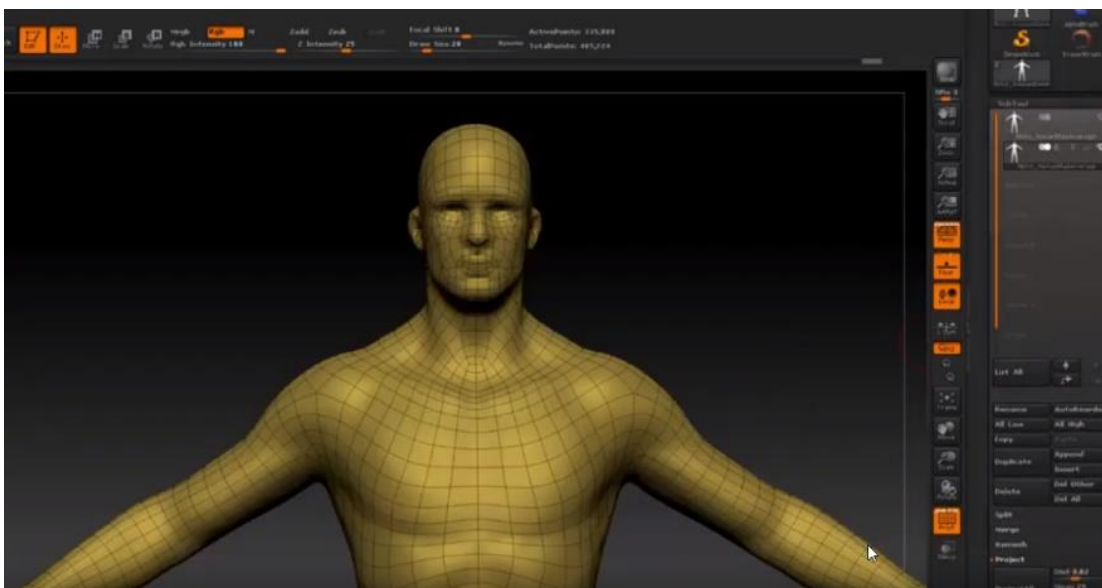


Figure 3.3: Zbrush Modeling

In the character modeling section I modeled several model like main character model (Agent-71), enemy character models. I developed also the other props models like wall, box, wood house, concrete building etc.

In Zbrush I create the highpoly character models that I needed, then I retopology them to make lowpoly for further implementation to Unity with also using Autodesk Maya software.



Figure 3.4: Main Character



Figure 3.5: Environment Design

I use some Unity game asset for designing the environment of my game. Where I also input those textures and materials from same place. I also use trees & plants and other environment props from unity assets library.

3.3 Texturing Process

In texturing process, I used Maya material & UV editor for my specific models. For UV custom texture I used Adobe Photoshop & Illustrator to design my required textures such as characters & other main model.

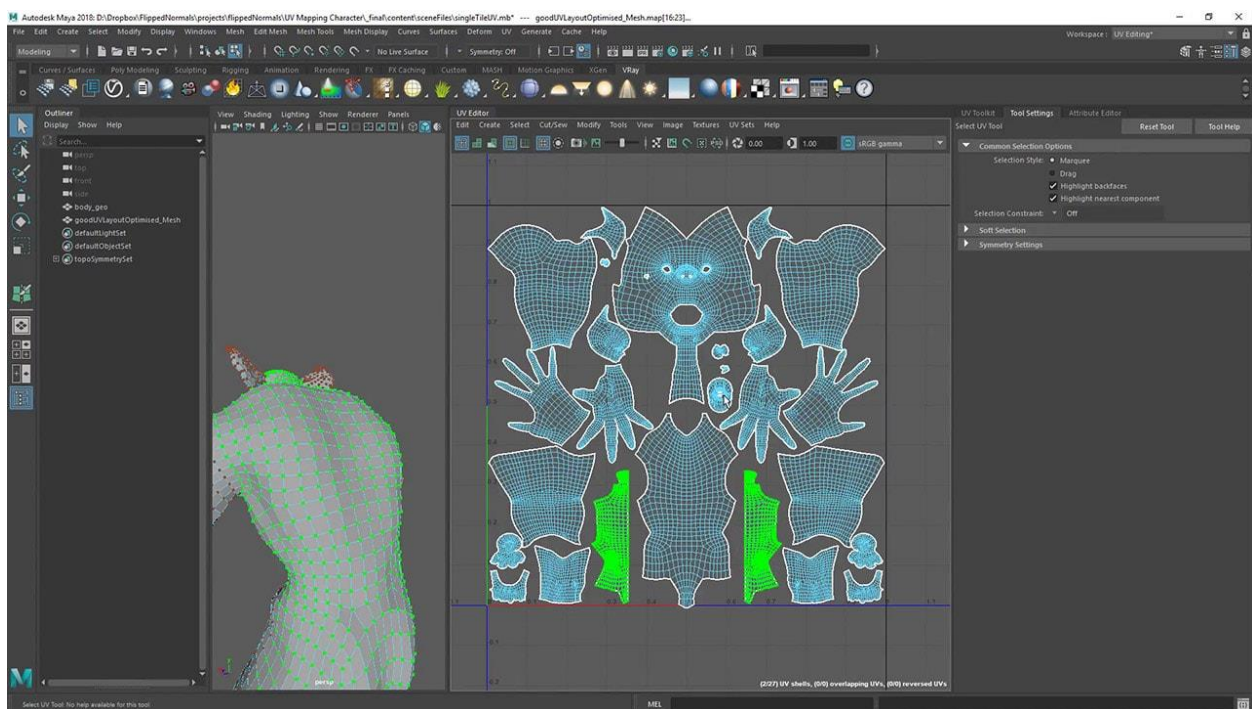


Figure 3.6: UV editing

Some models also textured by using 3ds max software. But mostly are modified by Maya. These textures I made it from illustrator and photoshop. In maya software I used UV planner tools for simple texturing process but for the character model I use uv texturing process by using uv editor.

UV Editing also need to modify several times whether it need or not. On the other side the proportion of every textures need to be painter accurately. If their cutting edge not matched accurately there will be a mass problem occurred.

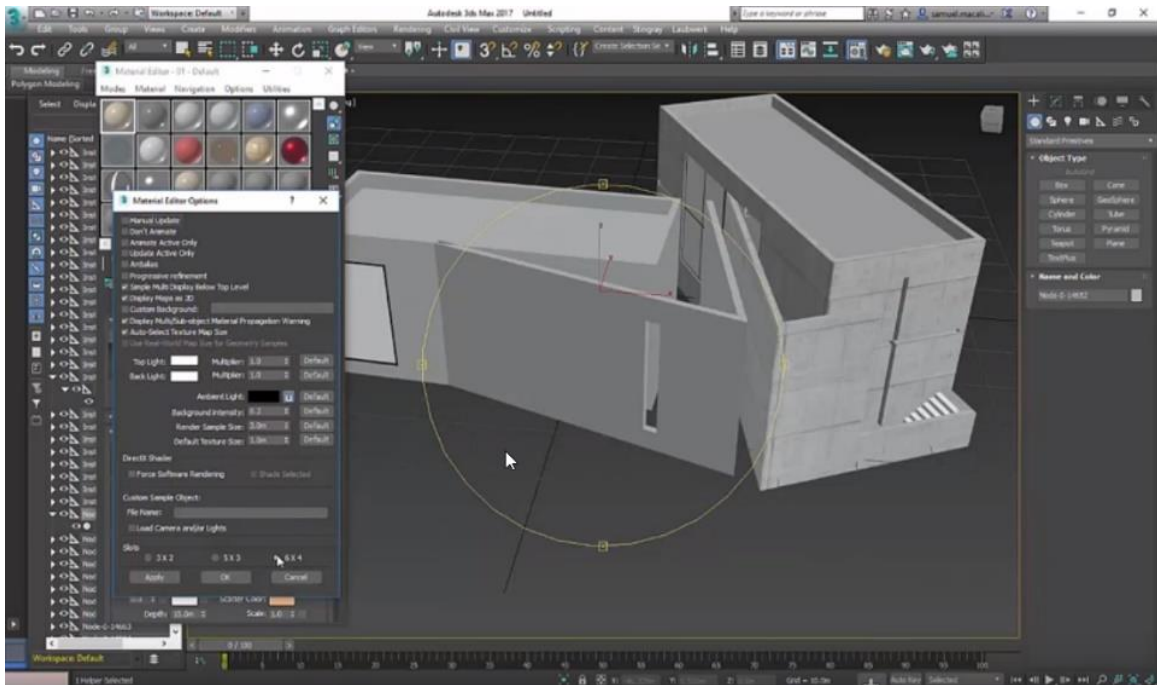


Figure 3.7: building texturing

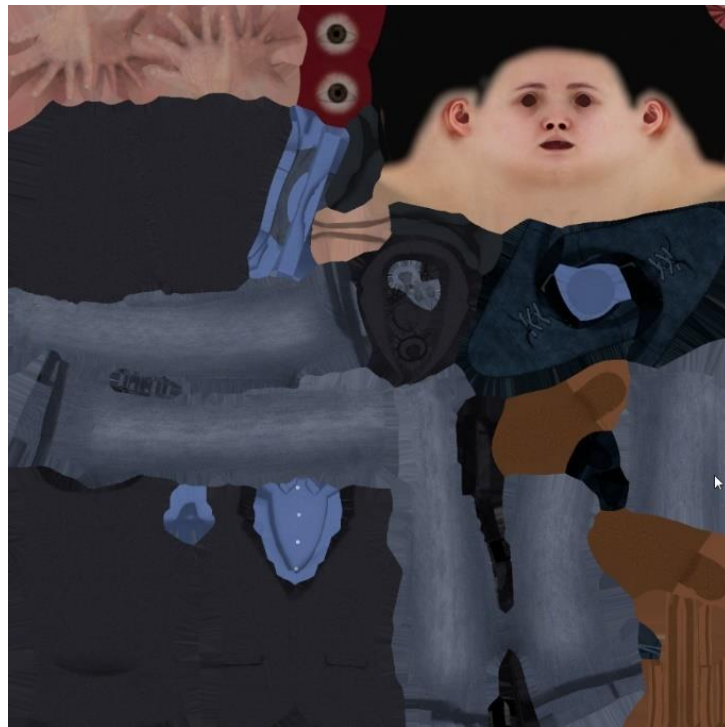


Figure 3.8: UV texture

For making the my main character model texture I prefer to use the Zbrush painting technique for paining the body texture. After that I used displacement technique to produce the texture.

3.4 Unity Workflow

After modeling part completed, I had converted every model into a FBX object for unity engine. Without this format I could not use these models as game assets for my project. I also was concentrated into the size of the model for adjusting. I input all of my designed models to Unity game engine as game asset file. I also made ready my required platform in Unity by implement my required assets and other files.

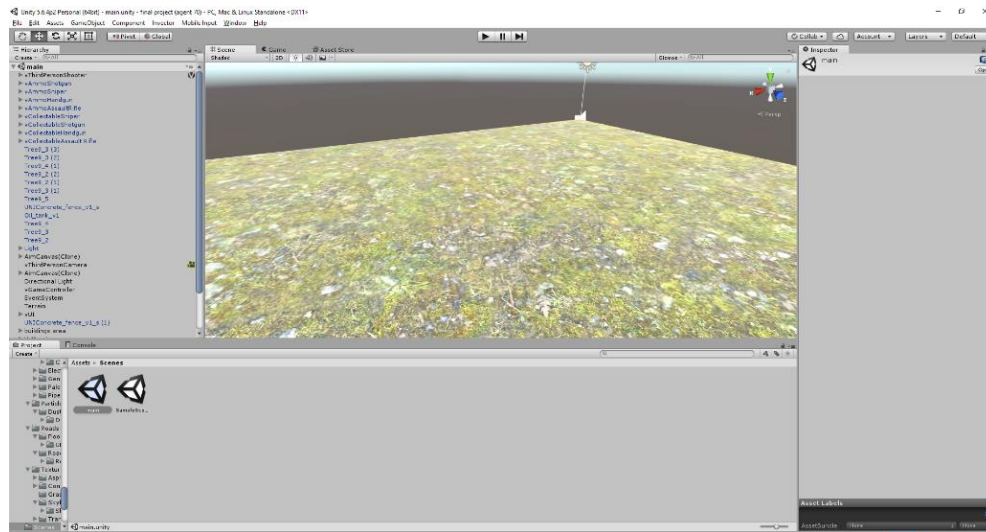


Figure 3.9: Unity starting

After that I developed the hardest part that the main player controlling process, where I use my main character then developed it to a third person shooter character. In this process used Invector plugins for developing the main character model controller. Without this I could not developed the character in perfect condition.



Figure 3.10: Third Person Controller

I also developed the other character such as enemy, whose are attacking the main player. I developed the weapons and other models into a animation process with special effects. I used raytraching tools for using firing effect.

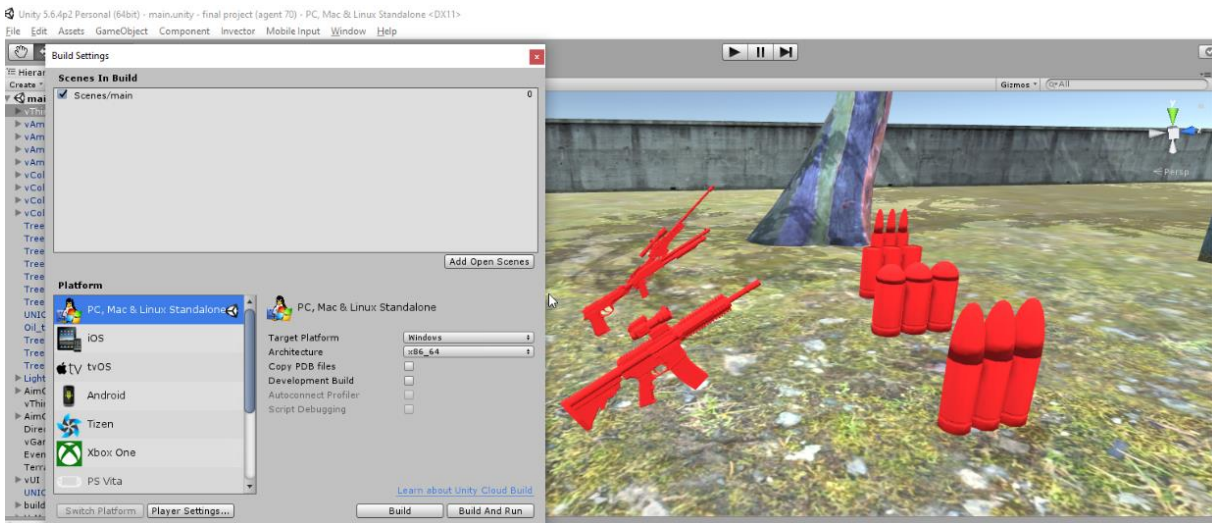


Figure 3.11: Weapon & ammo

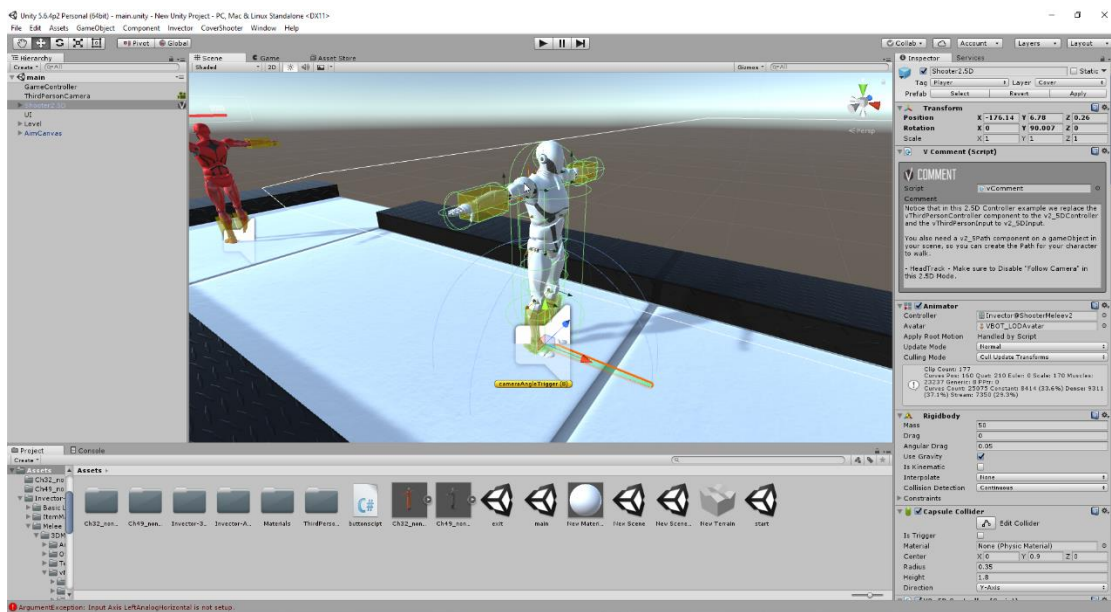


Figure 3.12: Player character setup

I also developed other materials & props such as firing, gun inventory, health bar etc. interface components. I used some other effects in unity like when bullet connected to other objects as like wall, surface, enemy characters, drums, boxes and so on. Everything have individual effects when bullet collided with them.



Figure 3.13: Enemy character setup

For level design I choose to use Unity button technique where I design a background image for the home screen and use three scenes for my game. Where is a home screen or manu screen at first. After that When press start button the 1st scene of game will be appeared after that atomically another screen will be appeared which is the main battleground.

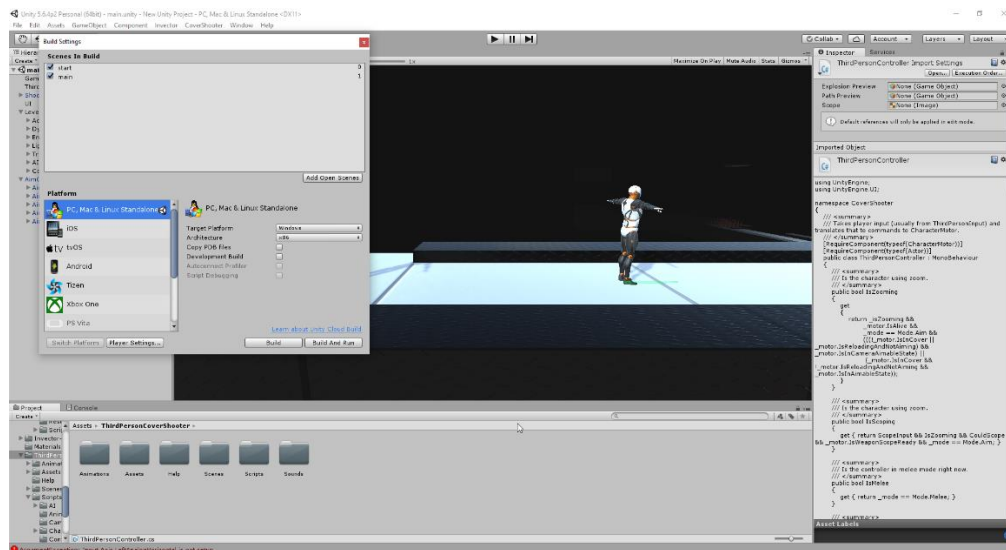


Figure 3.14: Game building

In the end I built this game on windows, linux& IOS platform.I building process I had to added every scene then built the game as well as examine the game performance.

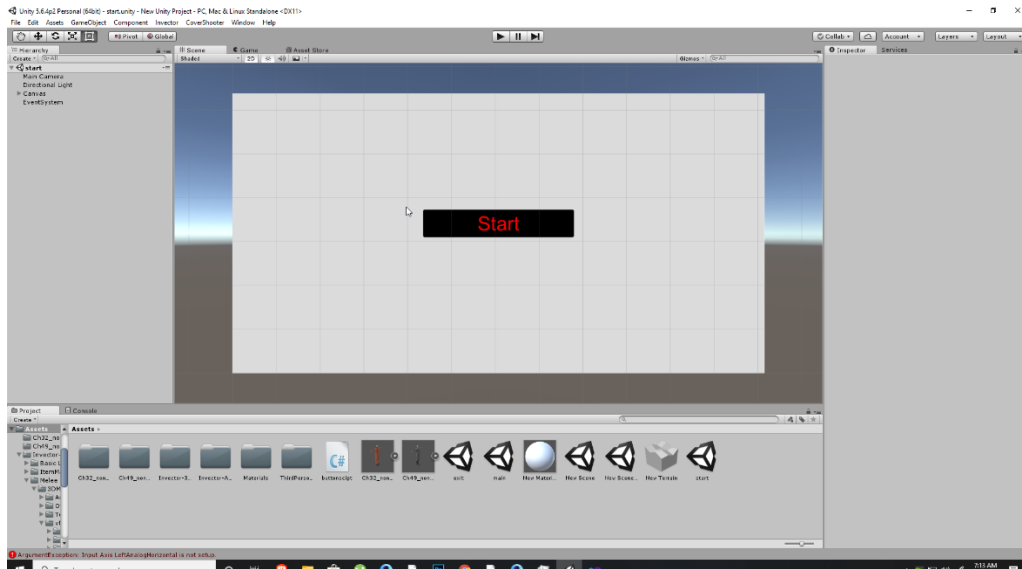


Figure 3.15: Button setup

3.5 Coding

When working on Unity I also done programming for my character movement and other gaming interfaces and levels. I use C# programming language by using Visual Studio. I written the most important script called third person character controller where I had to use every movement and other effects.

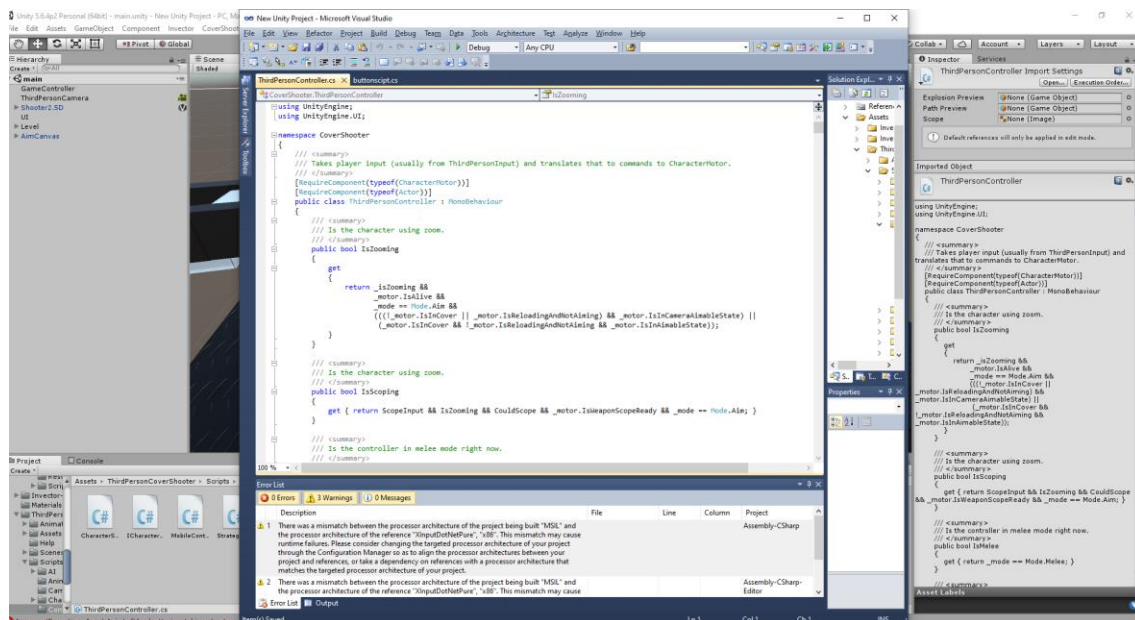


Figure 3.16: player script

For camera perspective script I use some component like collider, audio source I written the appropriate code for my project.

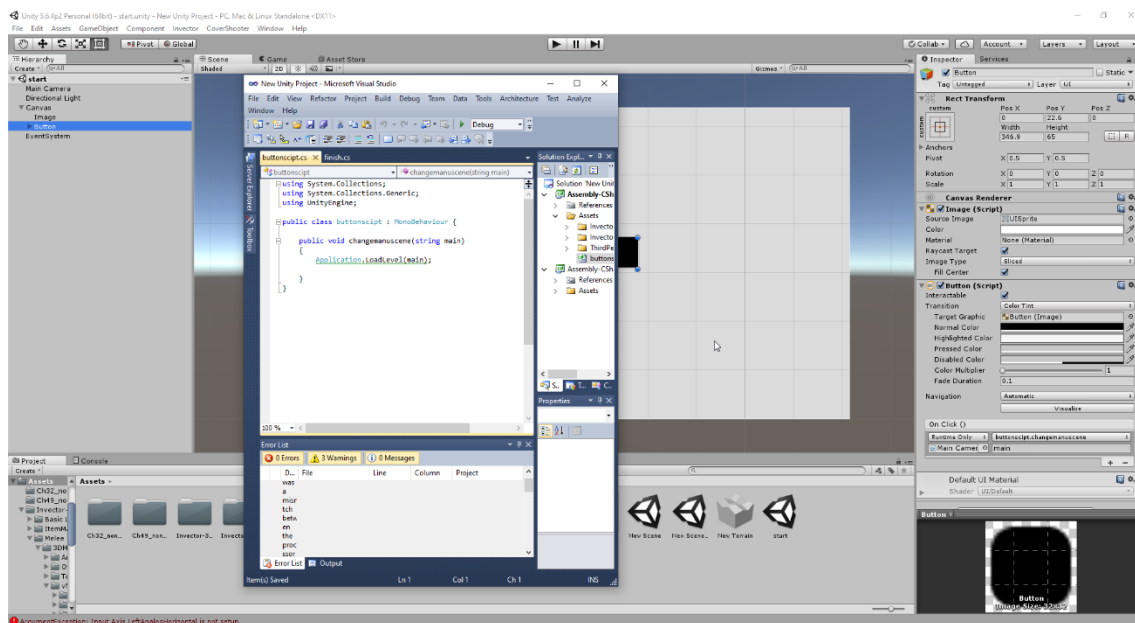


Figure 3.17: Scene script

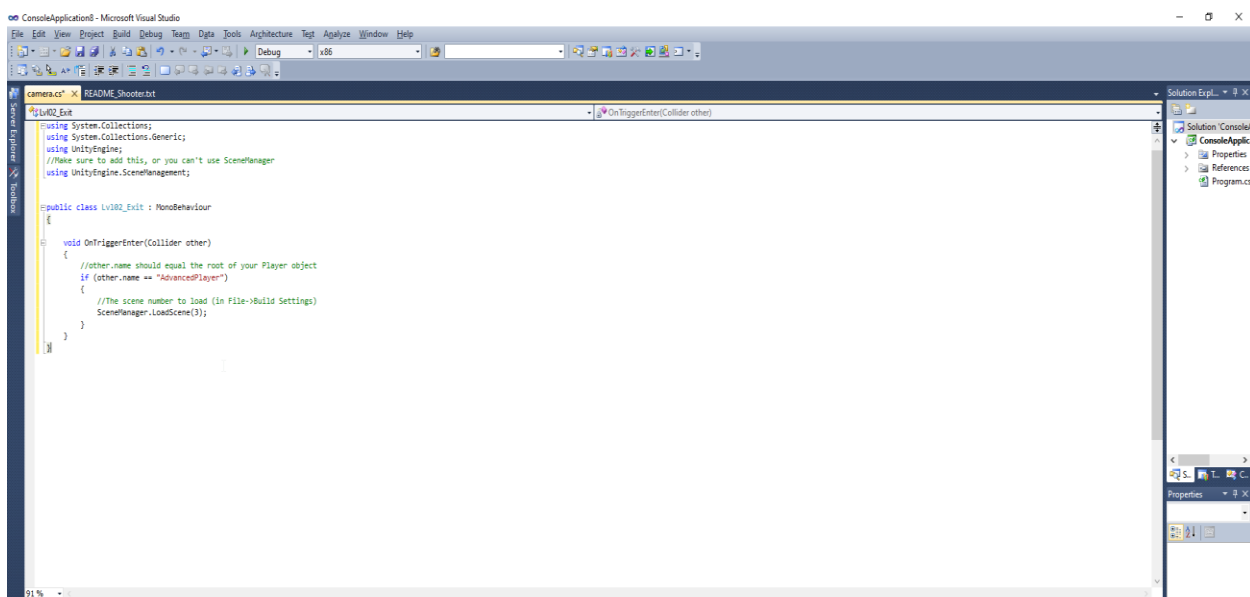


Figure 3.18: button script

I also use other script for connected to other scene I written I scenemangement code. There are also used Button script for the menu scene where I used a different code for this as well.

CHAPTER 4

SOFTWARES & PLUGINS

4.1 ZBrush



Figure 4.1: Zbrush

ZBrush is a most mainstream programming for chiseling 3d model. It is an advanced chiseling apparatus that consolidates 3D/2.5D displaying, finishing and painting. It utilizes a restrictive "pixol" innovation (see beneath) which stores lighting, shading, material, direction, and profundity data for the focuses making up all articles on the screen. The primary distinction among ZBrush and progressively customary demonstrating bundles is that it is increasingly much the same as conventional chiseling.[3]

ZBrush is utilized for making "high-goals" models (ready to arrive at 40+ million polygons) for use in motion pictures, games, and activitys, by organizations extending from ILM and Weta Digital, to Epic Games and Electronic Arts. ZBrush utilizes dynamic degrees of goals to enable stone workers to make worldwide or neighborhood changes to their models.

ZBrush is generally known for having the option to shape medium to high recurrence subtleties that were customarily painted in knock maps. The subsequent work subtleties would then be able to be traded as typical maps to be utilized on a low poly form of that equivalent model. They can likewise be traded as an uprooting map, despite the fact that, all things considered, the lower poly form for the most part requires more goals. Or on the other hand, when finished, the 3D model can be anticipated onto the foundation, turning into a 2.5D picture (whereupon further impacts can be applied). Work would then be able to start on another 3D model which can be utilized in a similar scene. This component lets clients work inside confused scenes without an overwhelming processor overhead. [3]

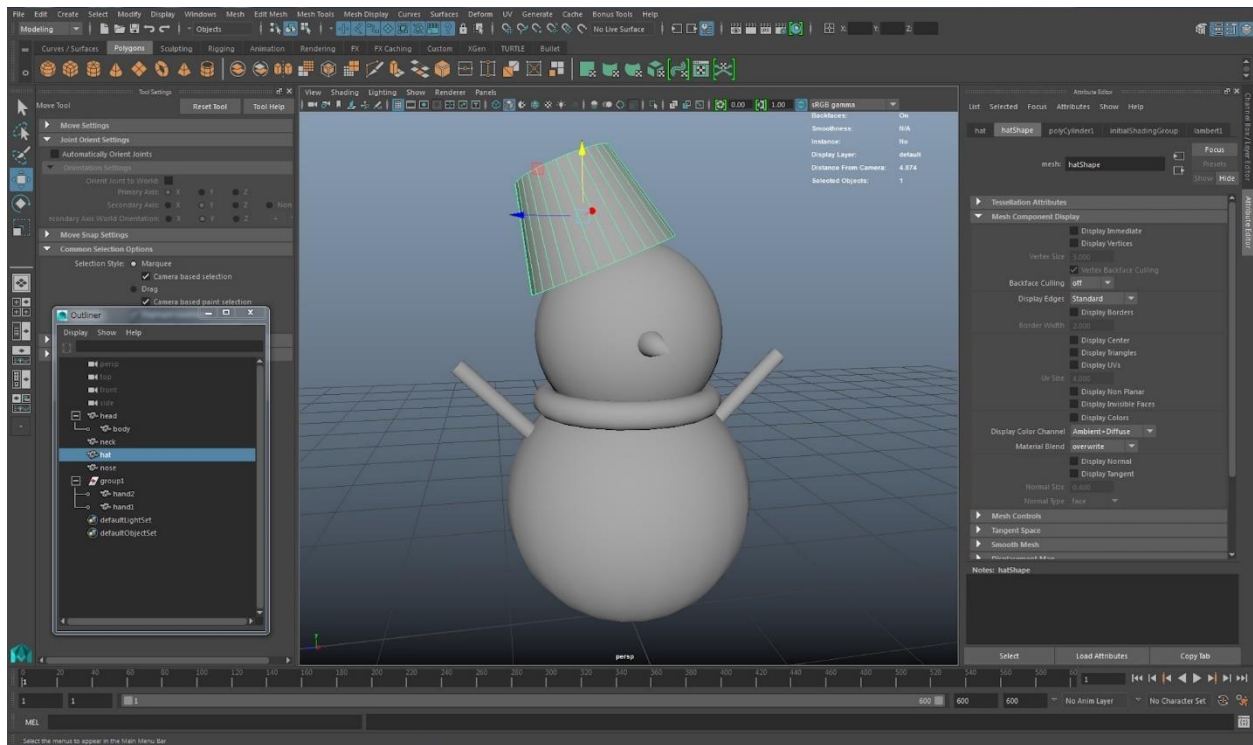


Figure 4.4: Maya Interface

Autodesk 3ds Max, in the past 3D Studio and 3D Studio Max, is an expert 3D PC illustrations program for making 3D activities, models, games and pictures. It is created and delivered via Autodesk Media and Entertainment.[1] It has displaying capacities and an adaptable module design and should be utilized on the Microsoft Windows stage. It is every now and again utilized by computer game designers, numerous TV ad studios, and building representation studios. It is likewise utilized for film impacts and motion picture pre-representation.



Figure 4.5: Autodesk 3Ds Max

For its demonstrating and movement instruments, the most recent rendition of 3ds Max likewise includes shaders, (for example, surrounding impediment and subsurface dispersing), dynamic

reproduction, molecule frameworks, radiosity, ordinary guide creation and rendering, worldwide light, an adaptable UI, new symbols, and its very own scripting language. [7]

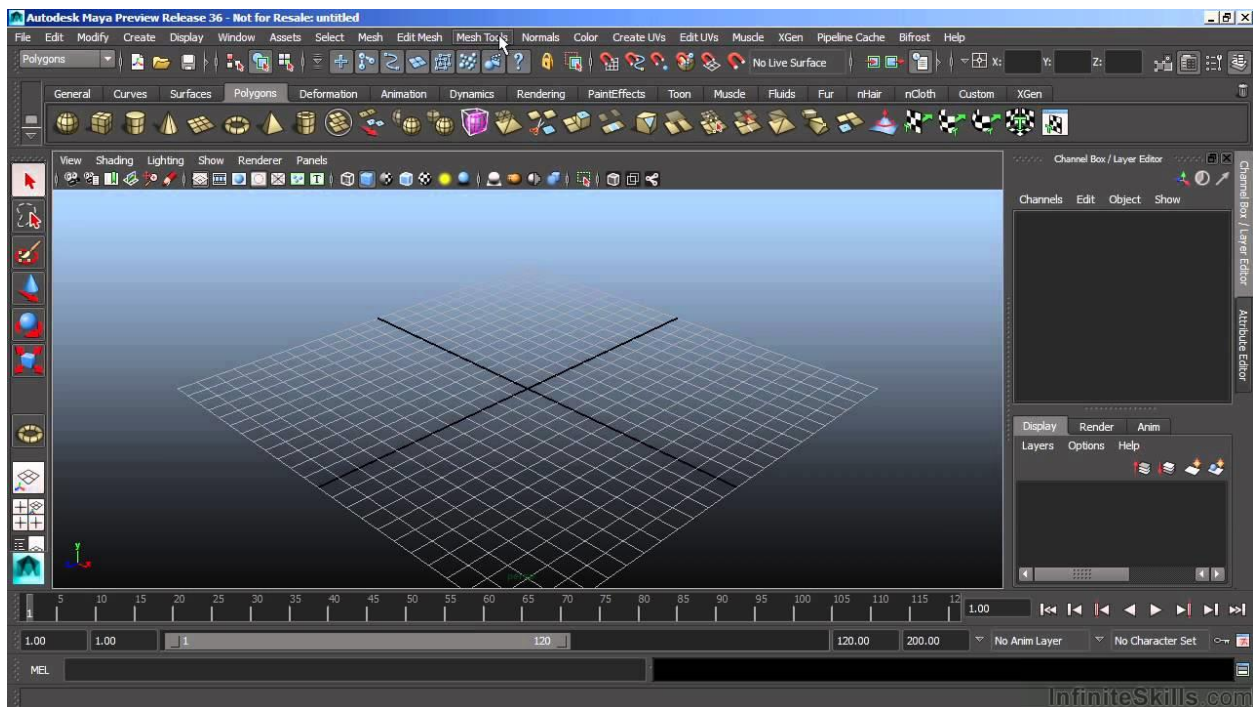


Figure 4.6: Max Interface

4.3 Unity 3D



Figure 4.7: Unity

Unity is one of the most popular game engine besides another software known as “Ureal Engine”.

Solidarity is a cross-stage game motor created by Unity Technologies, first reported and discharged in June 2005 at Apple Inc's. Worldwide Developers Conference as a Mac OS X-select game motor. Starting at 2018, the motor had been reached out to help in excess of 25 stages. The motor can be utilized to make three-dimensional, two-dimensional, computer generated experience, and expanded reality games, just as reproductions and other experiences.

The motor has been received by ventures outside video gaming, for example, film, car, design, building and development. A few significant variants of Unity have been discharged since its dispatch. The most recent stable rendition, 2019.2.13, was discharged in November 2019. [9]

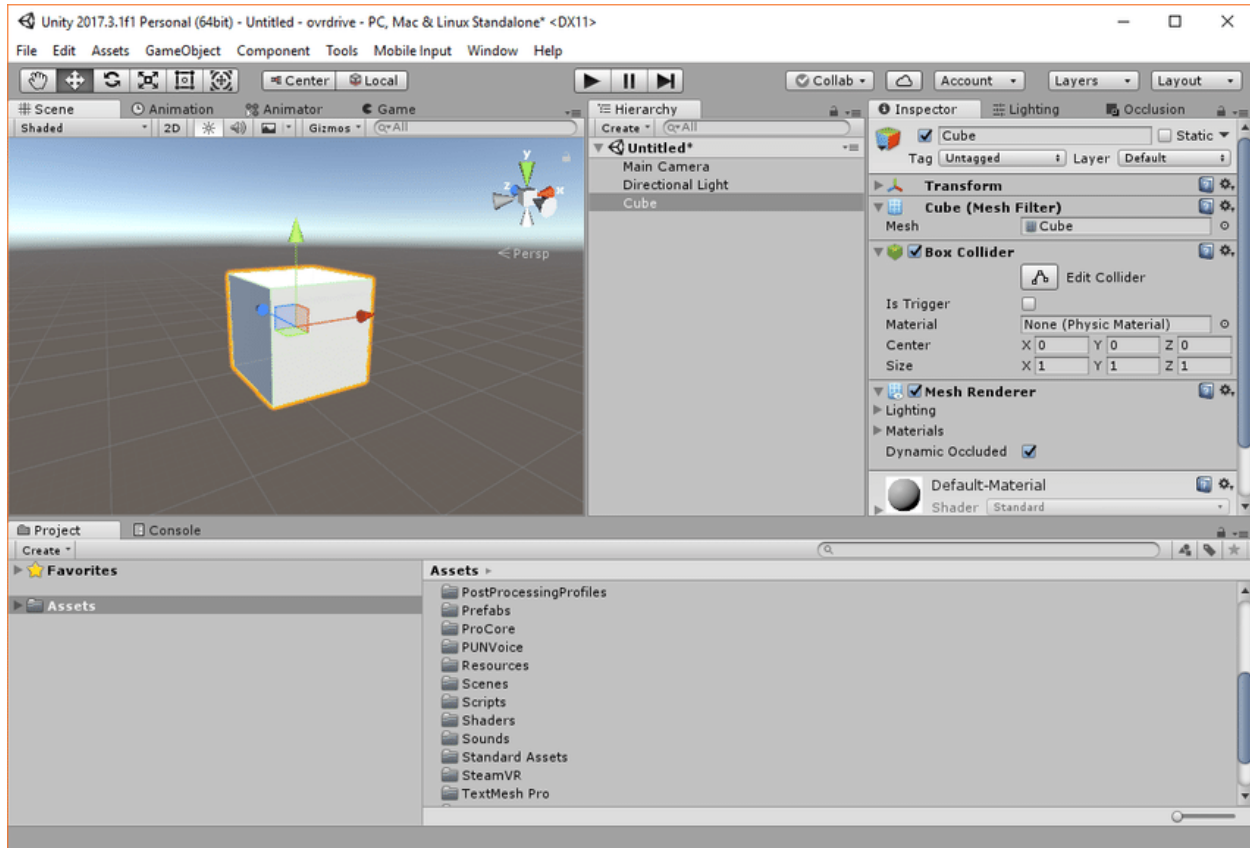


Figure 4.8: Unity Interface

4.4 Adobe Photoshop & Illustrator

This two software are very used for graphic design in every sector. On the other side there other several used like texturing.

Adobe photoshop is a raster illustrations editorial manager created and distributed by adobe inc. For windows and macos. It was initially made in 1988 by thomas and john meadow. From that point forward, this product has become the business standard in raster illustrations altering, yet in advanced workmanship overall. The product's name has therefore become a nonexclusive trademark, prompting its utilization as an action word (for example "to photoshop a picture", "photoshopping", and "photoshop challenge") in spite of the fact that adobe debilitates such use. Photoshop can alter and make raster pictures in different layers and supports covers, alpha compositing and a few shading models including rgb, cmyk, cielab, spot shading, and duotone.



Figure 4.9: Adobe Photoshop

Photoshop utilizes its very own psd and psb document configurations to help these highlights. Notwithstanding raster illustrations, this product has restricted capacities to alter or render content and vector designs (particularly through cutting way for the last mentioned), just as 3d illustrations and video. Its list of capabilities can be extended by modules; programs created and disseminated freely of photoshop that run inside it and offer new or upgraded highlights. [11]

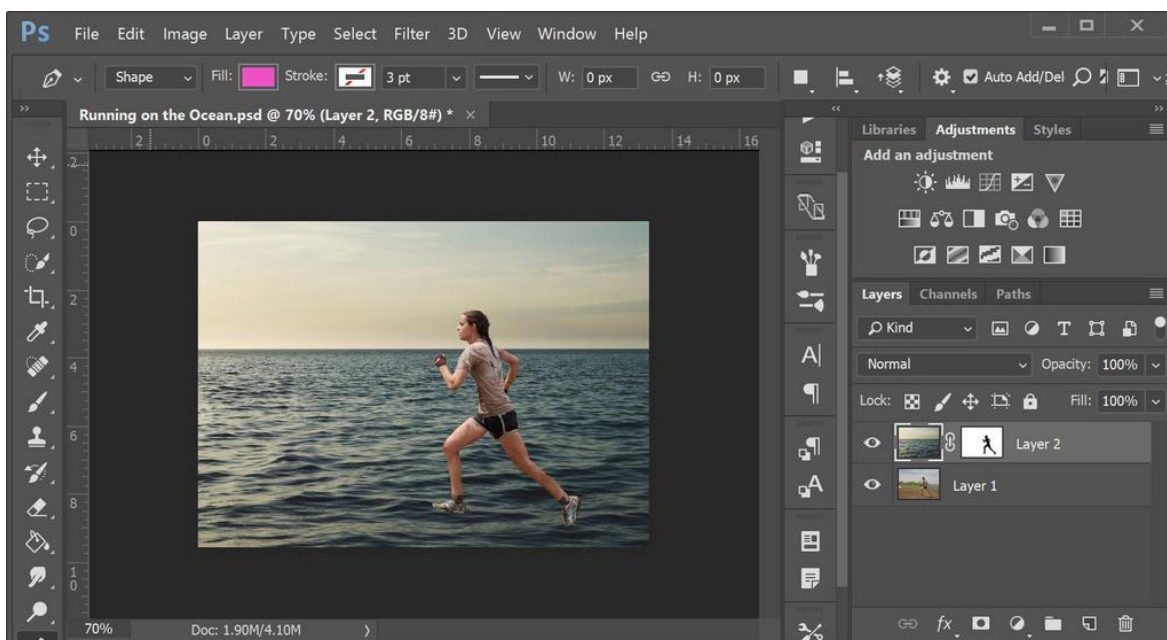


Figure 4.10:Photoshop Interface

Adobe Illustrator is a vector designs editorial manager created and promoted by Adobe Inc. Initially intended for the Apple Macintosh, improvement of Adobe Illustrator started in 1985. Alongside Creative Cloud (Adobe's work day to month to month or yearly membership administration conveyed over the Internet), Illustrator CC was discharged. The most recent variant, Illustrator CC 2020, was discharged in October 24th 2019 and is the 24th era in the

product offering. Adobe Illustrator was assessed as the best vector designs altering program in 2018 by PC Magazine. [13]



Figure 4.11: Adobe Illustrator



Figure 4.12:Illustrator Interface

4.5 Visual Studio

Visual Studio is a programming software there can be use many types of programming language like C#, java, C++ etc.

Microsoft Visual Studio is an incorporated improvement condition (IDE) from Microsoft. It is utilized to create PC programs, just as sites, web applications, web administrations and portable applications. Visual Studio utilizes Microsoft programming advancement stages, for example,

Windows API, Windows Forms, Windows Presentation Foundation, Windows Store and Microsoft Silverlight.



Figure 4.13: Visual Studio

It can deliver both local code and oversee code. Visual Studio incorporates a code supervisor supporting IntelliSense (the code finishing segment) just as code refactoring. The coordinated debugger works both as a source-level debugger and a machine-level debugger. Other inherent apparatuses incorporate a code profiler, originator for building GUI applications, website specialist, class architect, and database composition planner. It acknowledges modules that upgrade the usefulness at pretty much every level—including support for source control frameworks (like Subversion and Git) and including new toolsets like editors and visual architects for space explicit dialects or toolsets for different parts of the product improvement lifecycle (like the Azure DevOps customer: Team Explorer). [15]

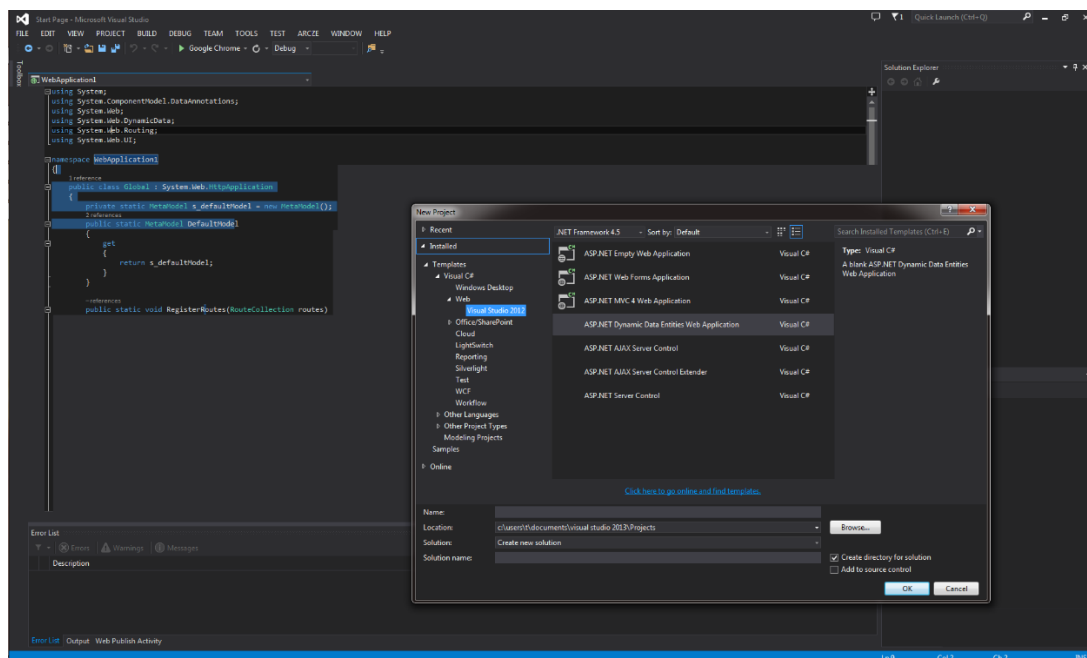


Figure 4.14: Visual Studio Interface

4.6 Adobe After Effect

This software are most commonly known for video editing & VFX.



Figure 4.15: Adobe After Effect

Adobe After Effects is an advanced enhanced visualizations, movement illustrations, and compositing application created by Adobe Systems and utilized in the after generation procedure of film making and TV generation. In addition to other things, After Effects can be utilized for keying, following, compositing, and liveliness. It likewise works as an extremely fundamental non-straight proofreader, sound editorial manager, and media transcoder. In 2019, the program won an Academy Award for logical and specialized accomplishment. [17]

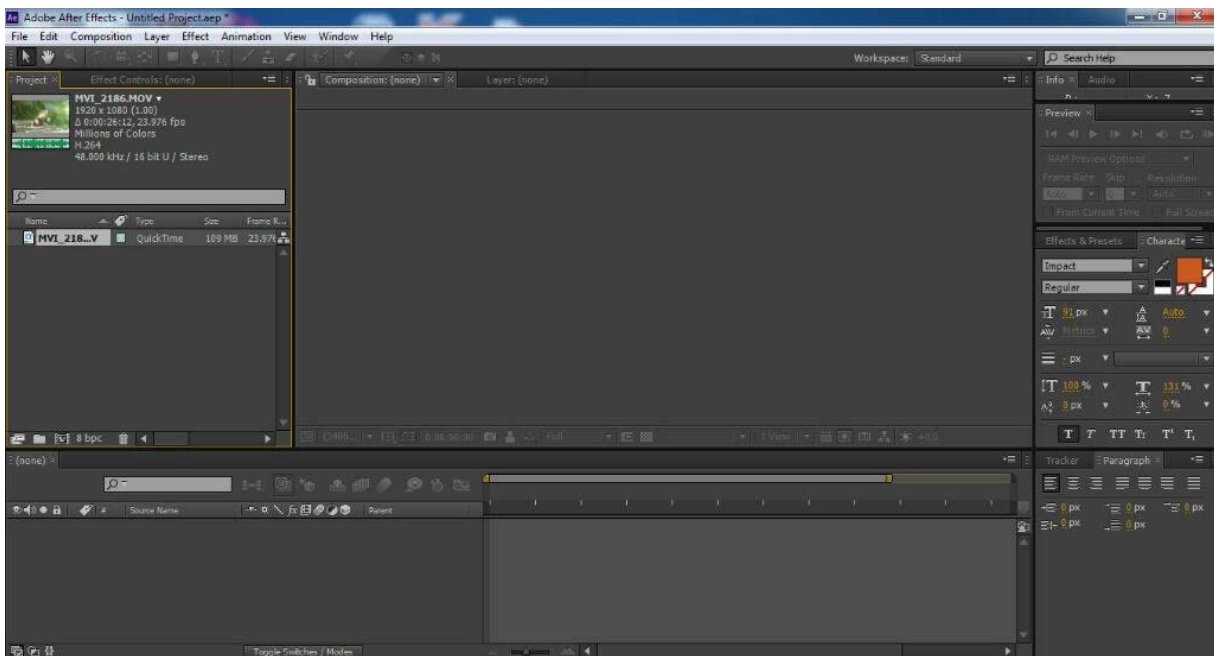


Figure 4.16: Adobe After Effect Interface

CHAPTER 5

OBSTACLES

5.1 Model for unity

I face a lot of problem to developing my required building model and most critical my character when I transform them to lowpoly as game asset this I need to careful, Because sometimes the character did not fit well.

On the other hand I needed to observe the National Museum place with eyes and collection as much as data I can. I found a lot of resource from online and practical visit where I found several side of the museum. I was confused I design this model where if I give my attention on the details of modeling it will be more complicated for me and my project range of quality. So, I decided to design the model of National Museum as lowpoly model with very less details. For interior I design only a few rooms which is related to my game play and story.

There are also faced problems to developing the Game character model. Because I model those character in Zbrush which is very high poly model. So I need to export it into the Maya, then retopology the model which suitable for my game.

5.2 Game Optimization

The most toughest problem I face in this project is to coding for the main player controlling. Where some time my player did not play properly as I wanted to. There I need to modify my codes more than 5 times.

For preventing this problem I contract with my project advisor beside researching on internet to find the appropriate solution. For easy method I use invactor tools in unity for developing the third person character controller also enemy UI. In the end I can control my player and can modify every thing from one component as well as enemy character also.

There are also some problems occurred when I design the animation of weapons and animation effects. This is called collision where I need to focused on the reality.

CHAPTER 6

FUTURE DEVELOPMENT

6.1 Maps Include

In this project I used only Bangladesh National Museum as one of my game's map, in future I will added more place like Lall Bag fort, Moynamoti Bihar etc. Because I need to introduce Bangladesh to other country. I will design these levels in very realistic type which will illustrate our country clearly. I made different types of story for different level. As like in the maps of national museum player have to retrieve the whale skeleton then the level of Maynamati Bihar player need to retrieve the valuable sculpture and so on. I battle ground also be

6.2 Other design

I will use more dynamic weather and environment as well as more props for my game. It will be show the game more interesting. I will developed a detail menu option where user can modify the character by wearing many types of cloths. User can also choose the difficulty level like (easy, medium, hard). User also can modify graphics quality, audio volume, sfx, music etc. There will be also other staffs like side mission, conversation animation cutscene, extra curriculum and so on.

I will also develop this game in mobile version for getting more user, where including (IOS, Android, Windows).



Figure 6.1: OS platform

CHAPTER 7

CONCLUSION

Innovation Evaluation as the venture rotated around Autodesk 3ds Max and Unity it was important to learn. This made an enormous weight on the undertaking at first which pushed it marginally bogged down. This is not out of the ordinary with any new innovation; in any case, chatting on the REALVIEW venture expanded the hazard with utilizing new techniques for sending out the models to solidarity. Making models in 3ds max and Exporting them was a decent learning experience.

What I have gained from this project:

This game will be developed specially for introduce our national history, culture & tradition to the future generation who are almost attached with their life to the digital technology like gamed, animation movie etc. This will be free to download & will be available on the most popular platform Windows. User need medium range computer to enjoy this game. User will enjoy the RPG action game environment with exploring the archeological place as the main environment of each level. I learned many unity technique that will help to future development of this project where I need not face those problems I hope. And now I have confidence to developed this with this knowledge while I have less knowledge about programming.

I believe that by developing this game will taken the biggest part of our gaming community. This gamed will be the inspiration to our countries game developers who will be more focus to develop various games based on our tradition & culture, which will be introduced our country not only to our young generation but also to the other country.

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