Software Engineering Unit-3 Project
Bowling Alley (Virtual Reality)
Design Document
Team - 25
Submission Date: 23 Apr 2022
GitHub Link:

Team Members

| NAME	Roll Number	Effort (Hrs)	Role
Aakash Singh	2021201087	12	Game scripts and handling of bowling score wrt. strikes , spares etc.
Soumodipta Bose	2021201086	12	Handling collision logic ,throw and momentum transfer and pin counter via game scripting.
Darshan Tripathi	2021201006	12	Placing and editing assets in unity, handling interactable objects.Creating various menu screens.
Sunayana Jindal	2021201067	12	Adding and handling audio files with collisions. Initial VR designing.
Sourav Kumar Singh	2021201072	12	Adding and maintaining score history.
Akhilesh Panicker	2021201081	12	Aesthetics and strike and spare animations.

Overview
Representation of a popular Bowling Alley game in VR Space. The Project includes a single player bowling game made for oculus quest 2 which provides life like experience of a bowling alley. The features include
- Interactable objects like bowling bowl and pins
- Simulation of Bowling Mechanics using the user throw
- Maintaining and displaying a scoreboard for the current game
- Handling of cases such as spares, strikes and updating their scores accordingly.
- Displaying animation on strike and spares.
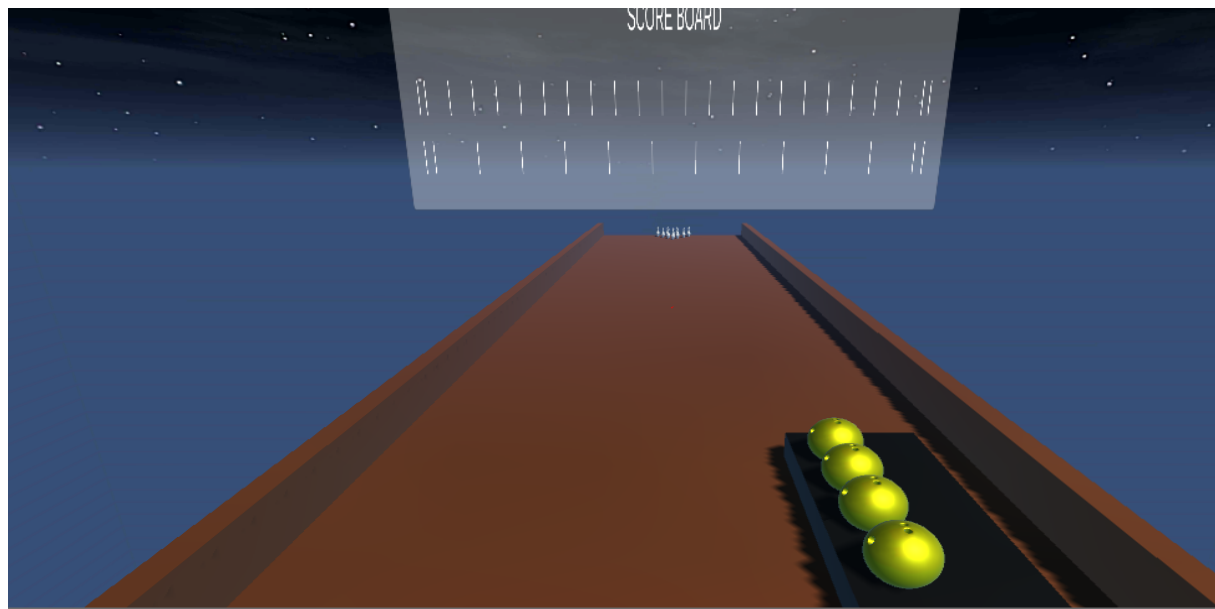- Audio tracks to simulate a real bowling environment

- Ability to keep a record of last 10 highscores
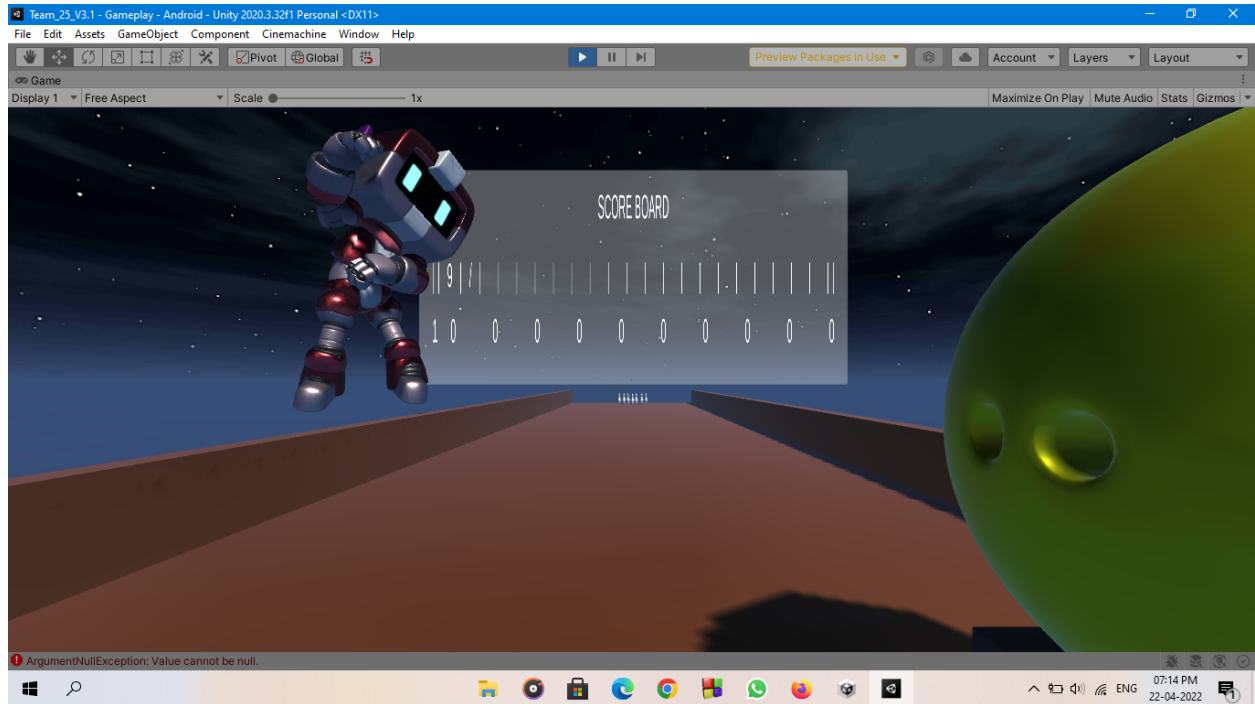- Navigation with the help of the main menu and a trailing screen.

Screenshots:
Main Menu:
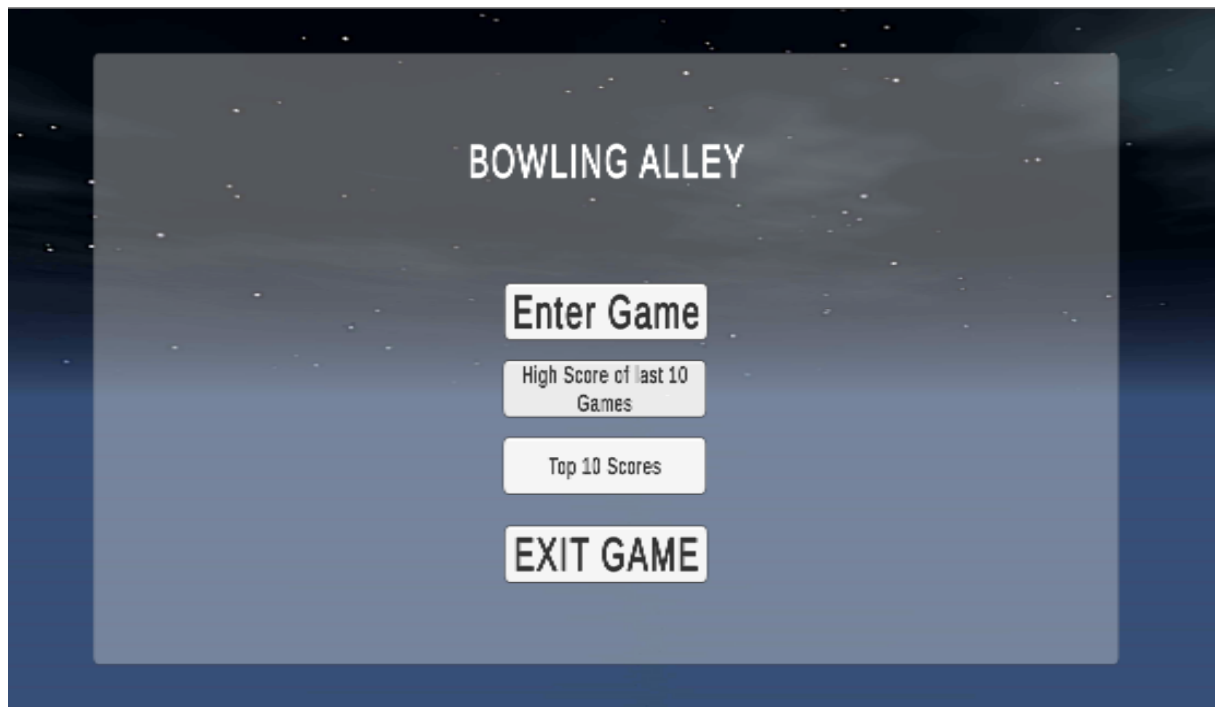
GamePlay Screen:

While Strike or Spare happen:

VR Mockup Screens:

SUNAYANA JINDAL
2021201067

What is to your side?
If you look left, what do you see?

What do you see in front of you?
Casually looking around, what do you see in your primary view?

What is to your side?
If you look right, what do you see?

ENTER NAME:

START

STRIKE

Look down!

What is behind you?
If you twist your torso and look over your *left* shoulder, what would you see?

What is behind you?
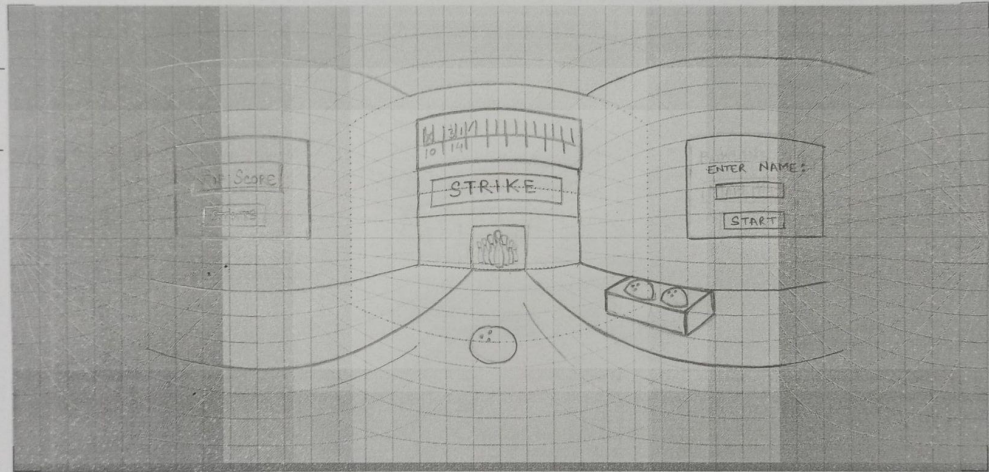If you twist your torso and look over your *right* shoulder, what would you see?

AAKASH SINGH
2021201087

Look up! What do you see if you look upward?

What do you see in front of you?
Casually looking around, what do you see in your primary view?
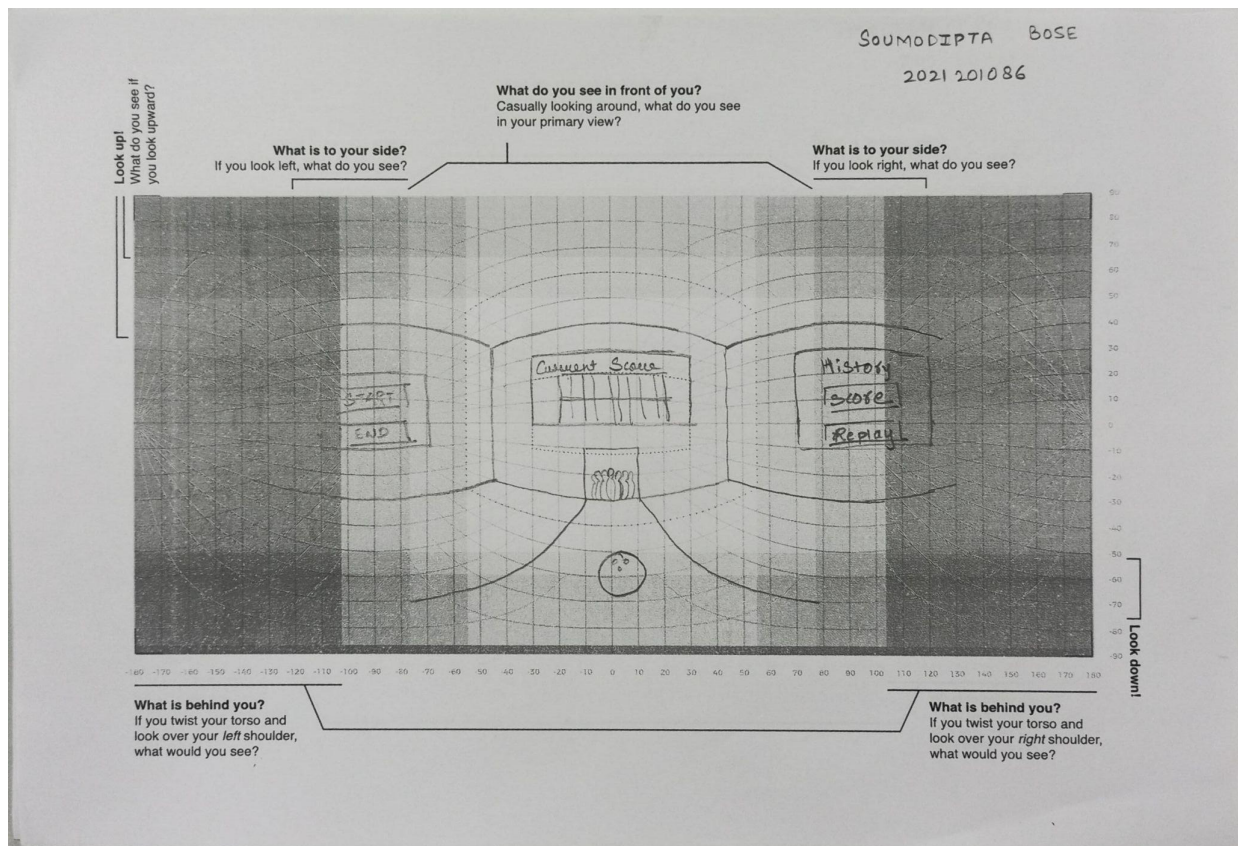
What is to your side?
If you look left, what do you see?

What is to your side?
If you look right, what do you see?

SCOREBOARD

START
END

Look down!

What is behind you?
If you twist your torso and look over your *left* shoulder, what would you see?

What is behind you?
If you twist your torso and look over your *right* shoulder, what would you see?

SOUMODIPTA BOSE
2021201086

Look up! What do you see if you look upward?

What do you see in front of you?
Casually looking around, what do you see in your primary view?

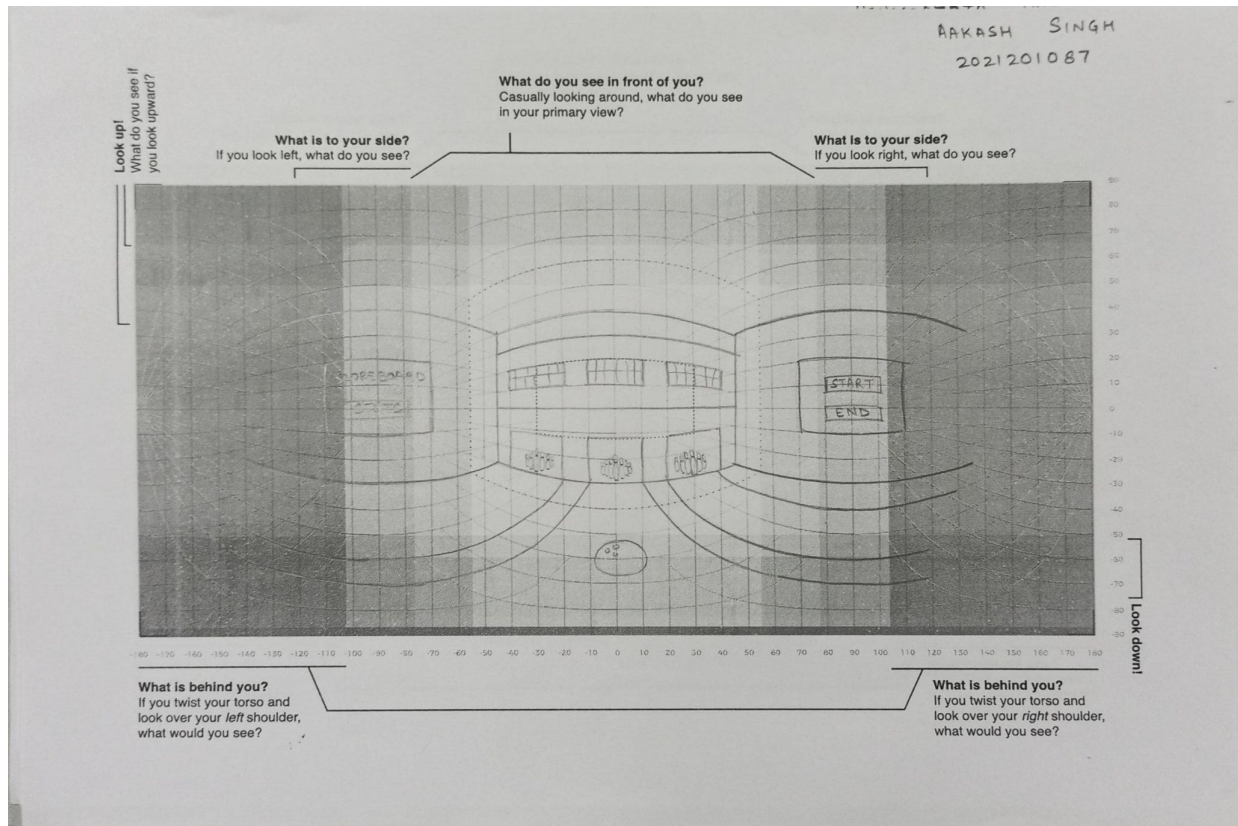**What is to your side?**
If you look left, what do you see?

What is to your side?
If you look right, what do you see?

Current Score

History
Score
Replay

S-ART
END

Look down!

What is behind you?
If you twist your torso and look over your *left* shoulder, what would you see?

What is behind you?
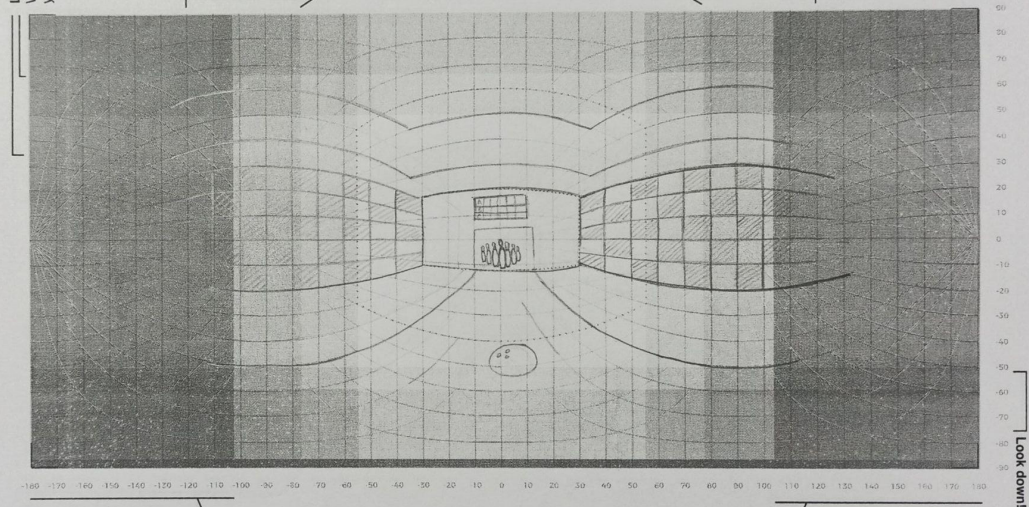If you twist your torso and look over your *right* shoulder, what would you see?

AKILESH PANICKER
2021201081

Look up!
What do you see if you look upward?

What is to your side?
If you look left, what do you see?

What do you see in front of you?
Casually looking around, what do you see in your primary view?

What is to your side?
If you look right, what do you see?

Look down!

What is behind you?
If you twist your torso and look over your *left* shoulder, what would you see?

What is behind you?
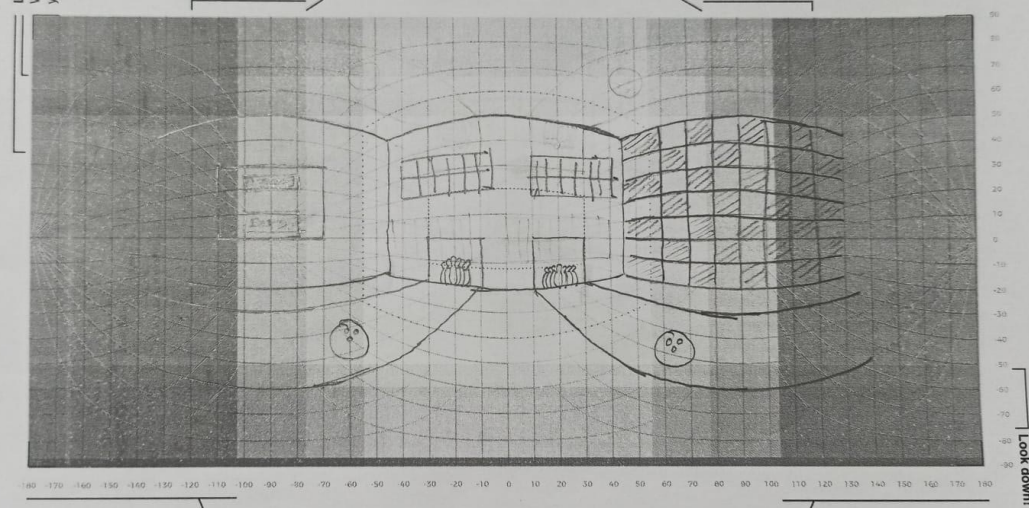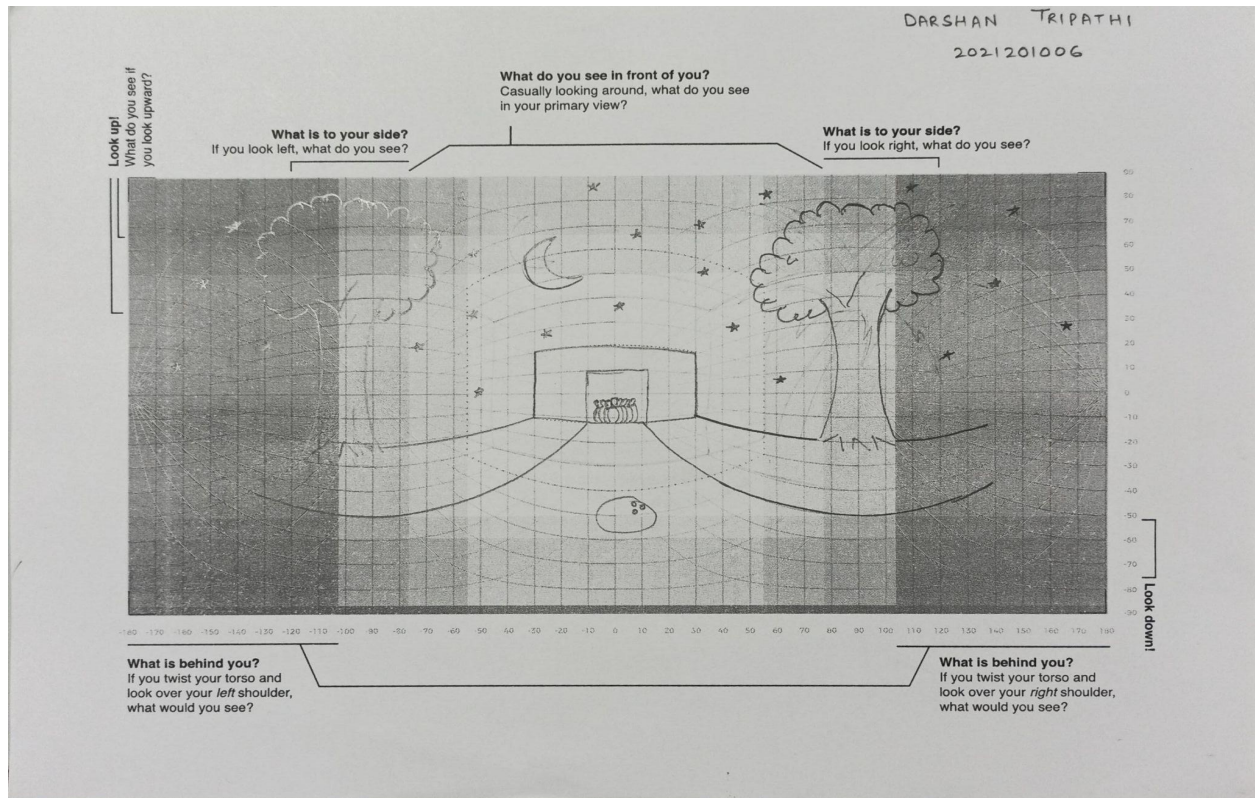If you twist your torso and look over your *right* shoulder, what would you see?

-180 -170 -160 -150 -140 -120 -110 -100 -90 -80 -70 -60 -50 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180

SOURAV SINGH
2021201072

Look up!
What do you see if you look upward?

What is to your side?
If you look left, what do you see?

What do you see in front of you?
Casually looking around, what do you see in your primary view?

What is to your side?
If you look right, what do you see?
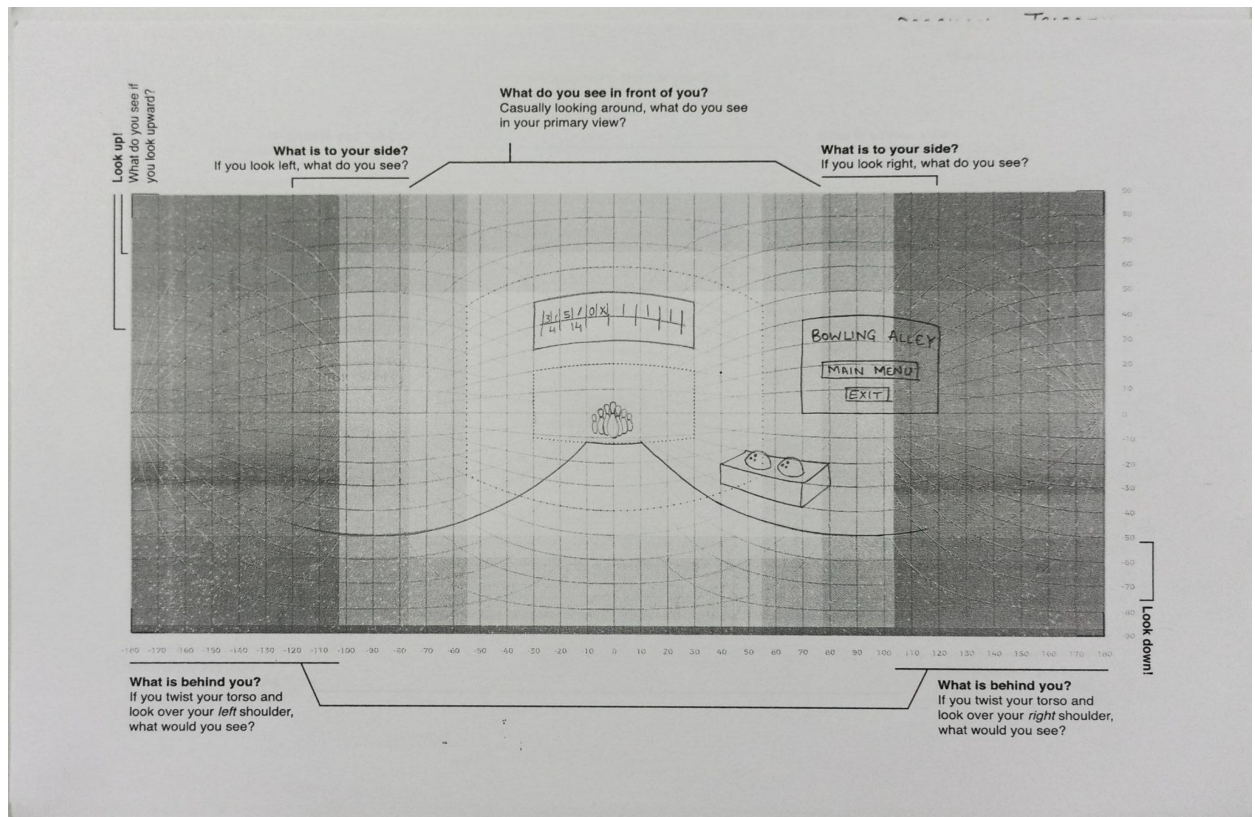
Look down!

What is behind you?
If you twist your torso and look over your *left* shoulder, what would you see?

What is behind you?
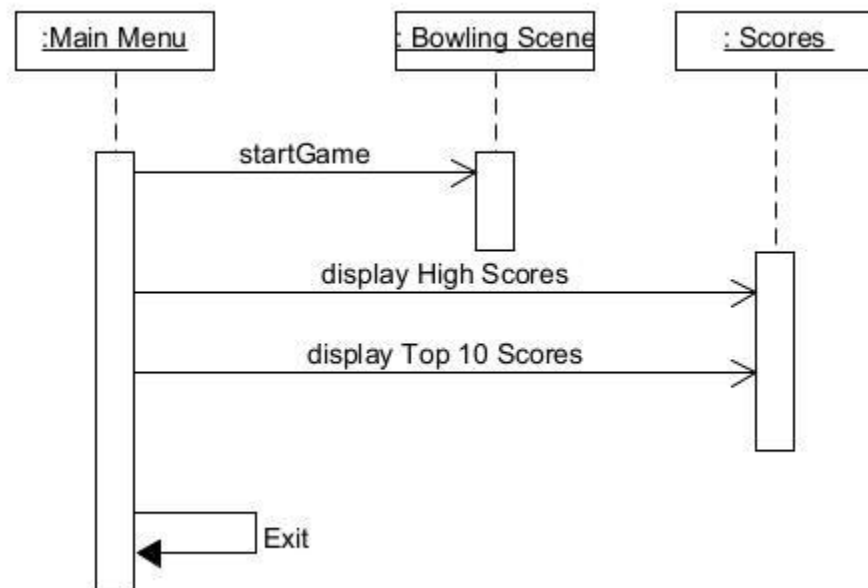If you twist your torso and look over your *right* shoulder, what would you see?

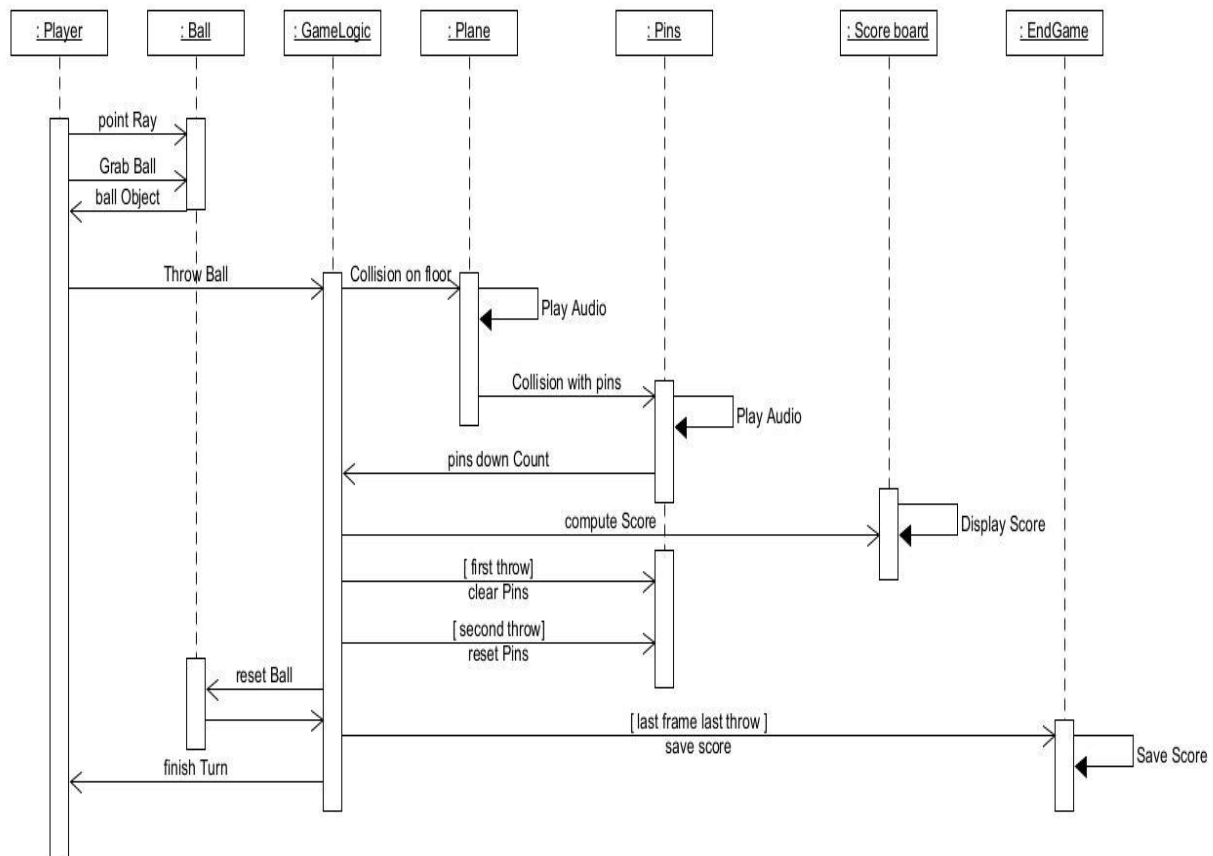-180 -170 -160 -150 -140 -130 -120 -110 -100 -90 -80 -70 -60 -50 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180

Final Design:

Flow Of Events

Main Menu

Simulation of throw

Sequence diagram objects: : Player | : Ball | : GameLogic | : Plane | : Pins | : Score board | : EndGame

- point Ray
- Grab Ball
- ball Object
- Throw Ball
- Collision on floor
- Play Audio
- Collision with pins
- Play Audio
- pins down Count
- compute Score
- Display Score
- [first throw] clear Pins
- [second throw] reset Pins
- reset Ball
- [last frame last throw] save score
- Save Score
- finish Turn

Desired Action	Flow of Events
Entering the game	1. Press enter game on the main menu.
Throwing a ball.	1. Point the vr controller towards the ball on the right. 2. Wait for the tracking ray to turn white. 3. Grab the ball by pressing the inner button with the middle finger. 4. Simulate a throwing action and the leave the grab button. 5. Wait for the ball to hit the pins, and then wait for the throw to reset and then go again. 6. Game will move to the end screen at the end of 10 frames.
Exiting the game.	1. Press the exit game on the menu screen in the back . 2. When led to the main menu press exit game again to go to the vr screen.

Checking the highest score	1. Go to the main menu. 2. Press the button "high score of the last 10 games". 3. Score will be visible on the same screen.
Checking last 10 scores	1. Go to the main menu. 2. Press the button "top 10 scores". 3. A new screen will open for the scores of last ten games. 4. Exit by pressing the exit button.