Unit 3 Bowling Alley (Virtual Reality) Design Document

Team 22

Title: Bowling Alley (Virtual Reality).

Date of Submission: April 23rd, 2022.

Github Repository:
https://github.com/debashish05/Bowling-Alley-Virtual-Reality-

Team Member	Work of hour	Contribution
Manu Gupta (2021202025)	20	1) Created scriptable objects for high score management and leaderboard storage. 2) Creating the scene and aligning the assets in the scene. Game manager logic for maintaining high scores, and leaderboards. 3) Adding XR rig and controller to the scene and managing the in headset views, VR Mockup Screens, and Testing.
Debashish Roy (2021201034)	15	1) Created a Home Menu to enter and exit the game. 2) Include four audio effects in the entire VR Scene. The effects are at the scene of rolling of the bowl, collision at pins, while at opening the menu, and while playing the game. 3) Overview and Misc part of the documentation and VR Mockup Screens. 4) Testing.
Ayush Mittal (2021201030)	11	1) Written logic for the participant user should have 10 attempts to reach the end of the game. 2) VR Mockup Screens. 3) Testing. 4) Documentation - Flow of events and miscellaneous parts of the document.
Sankalp Thakur (2021201042)	11	1) implemented detection for knocking out pins and calculation of the score. 2) Documentation of Overview and VR Mockup screens. 3) Testing.
Raman Shukla	14	1) Create a simple single-user – first-person bowling alley game. You may make use of the assets like

		Pins, Bowl, etc. from the UNITY asset store. 2) Documentation of Sequence Diagram and VR Mockup Screens 3) Testing of the Game.

OVERVIEW

A short overview section describing the product and the features included.

Product - Bowling alley VR

Bowling alley VR is a virtual reality game that simulates some aspects of bowling. It allows a user to play a game by giving 10 chances to throw the ball. The objective of the game is to knock over as many pins as possible. After every throw, the pins are reset to their original position. The number of pins knocked down is added to the score. The process repeats 10 times and the final score is added to the top 10 scores if it qualifies. There are various sound effects added to the game for different events and background music is added to the scenes. The game is in first person i.e. the game is seen from the perspective of the character.

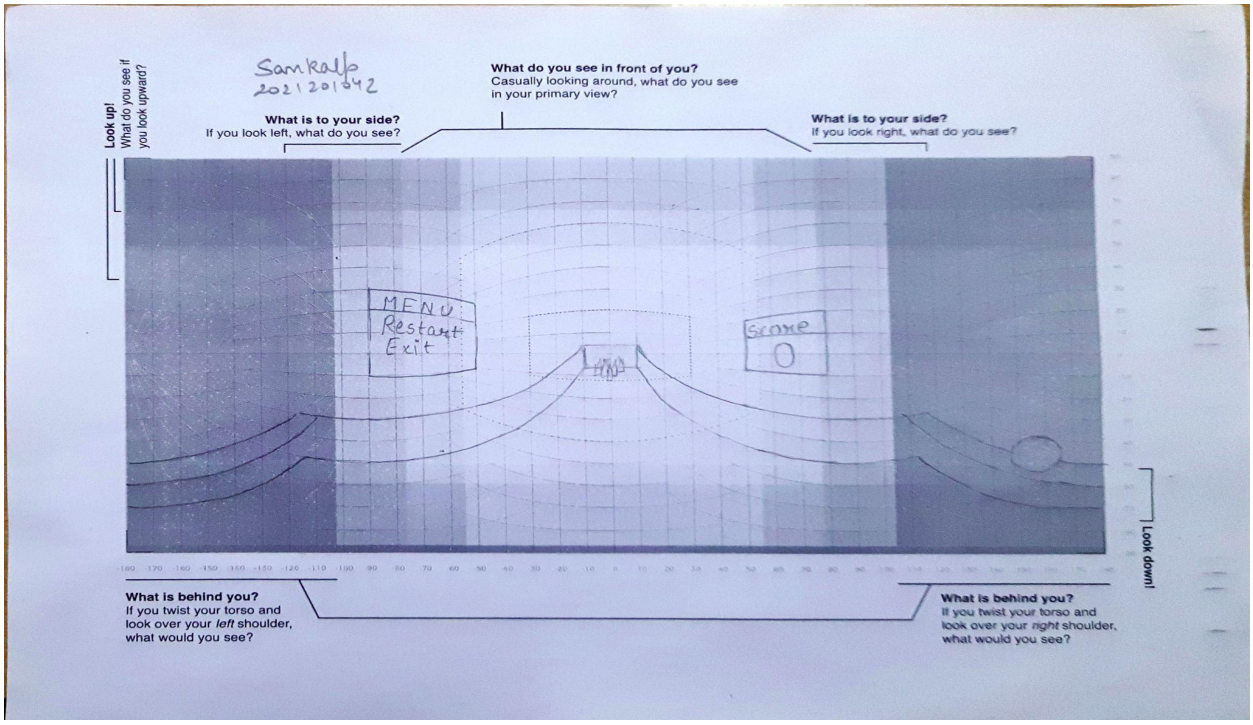
Features -

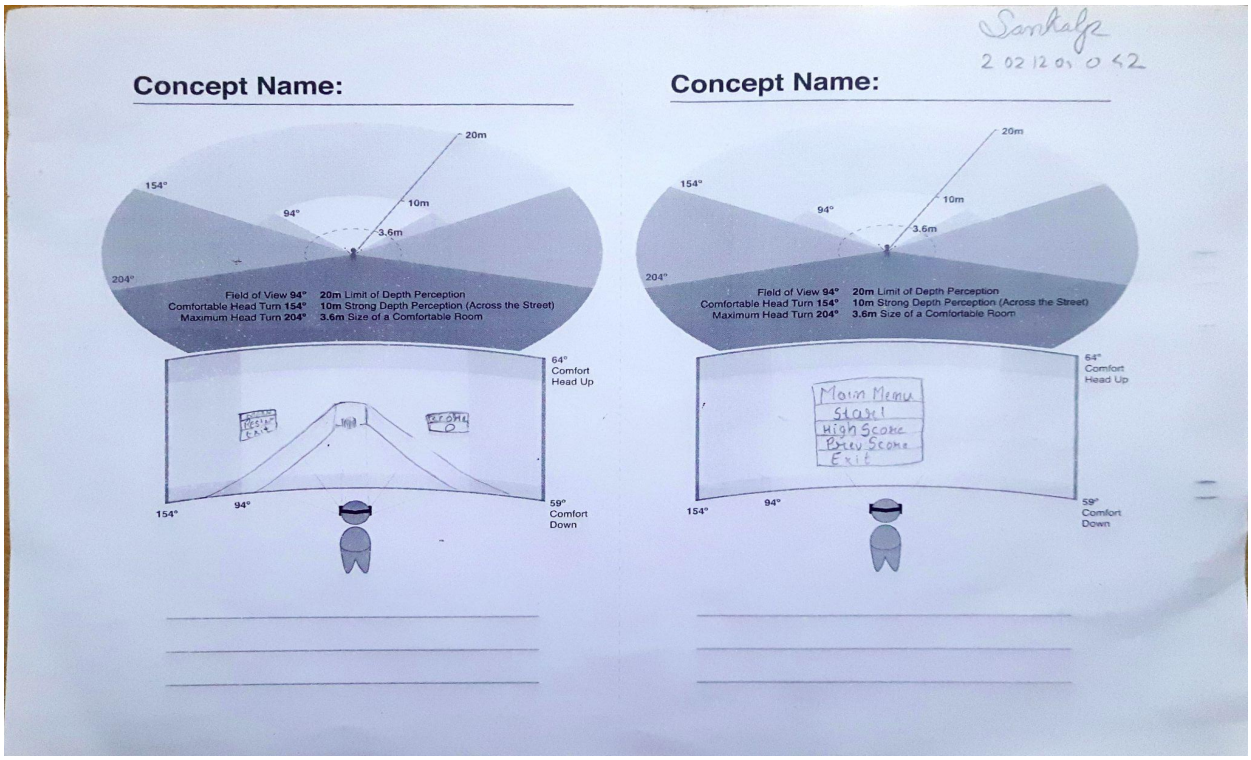
1. Single user First-person bowling alley game.
2. User gets 10 attempts to reach the end of the game.
3. Audio effects for bowling, background music, and ball-hitting pins.
4. Real-time score display for the user.
5. Top 10 scores overall
6. Main menu to start the game, see the top score, score history and exit the game.
7. Menu to restart the game and exit the alley to the main menu.

VR Mockup Screens:

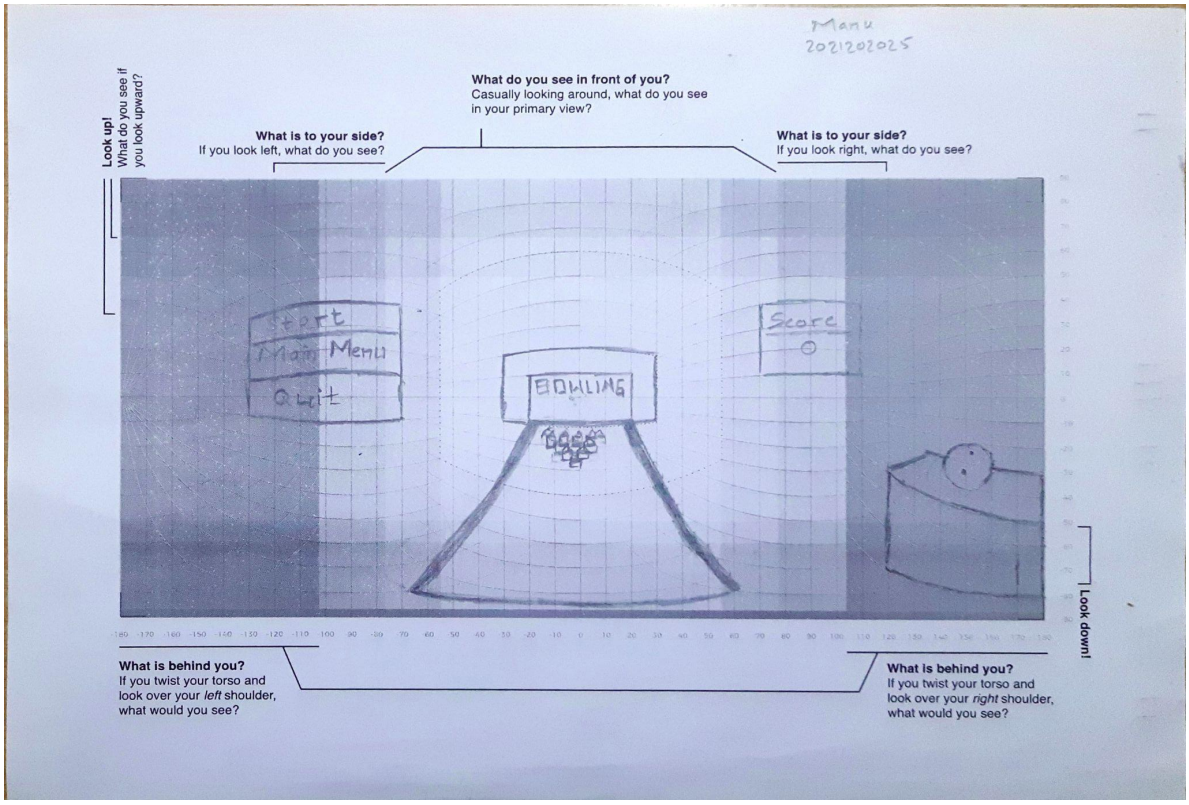
The VR Mockup made by our Team Members are as follows:

1. **Sankalp's VR Mockups:**

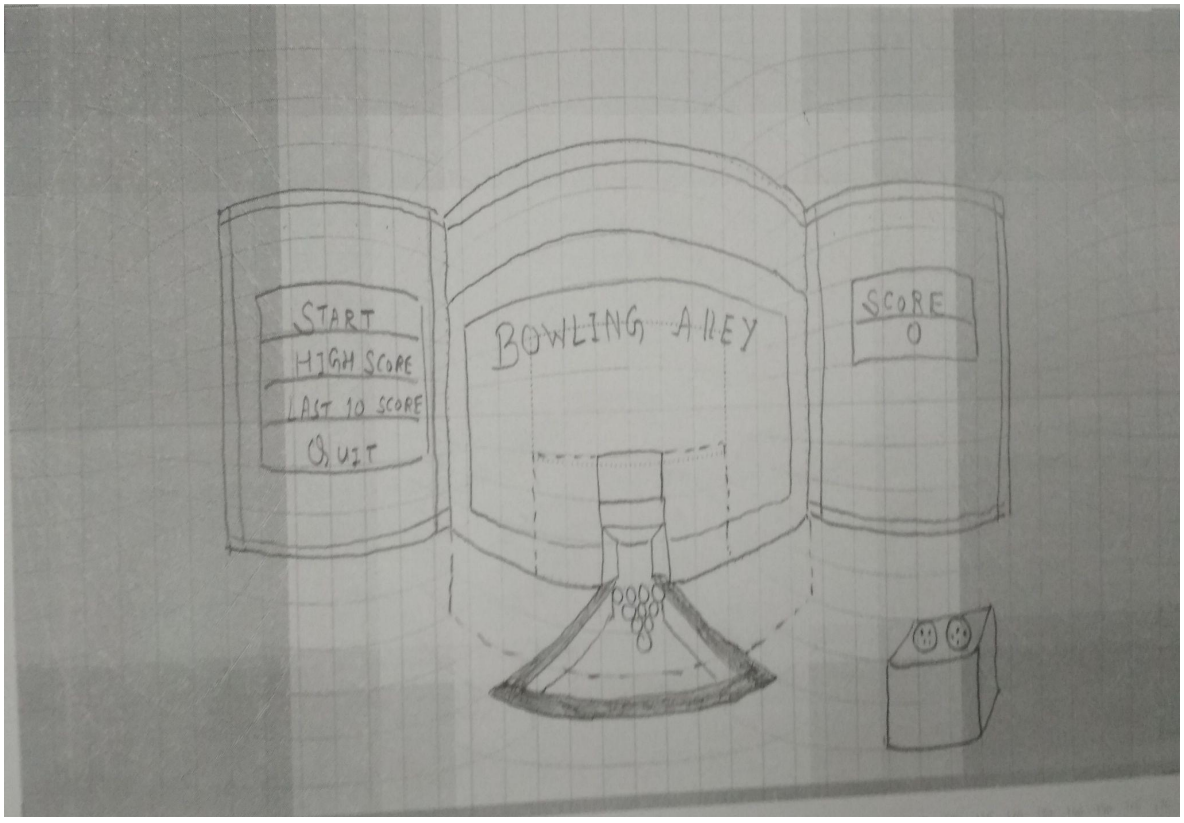




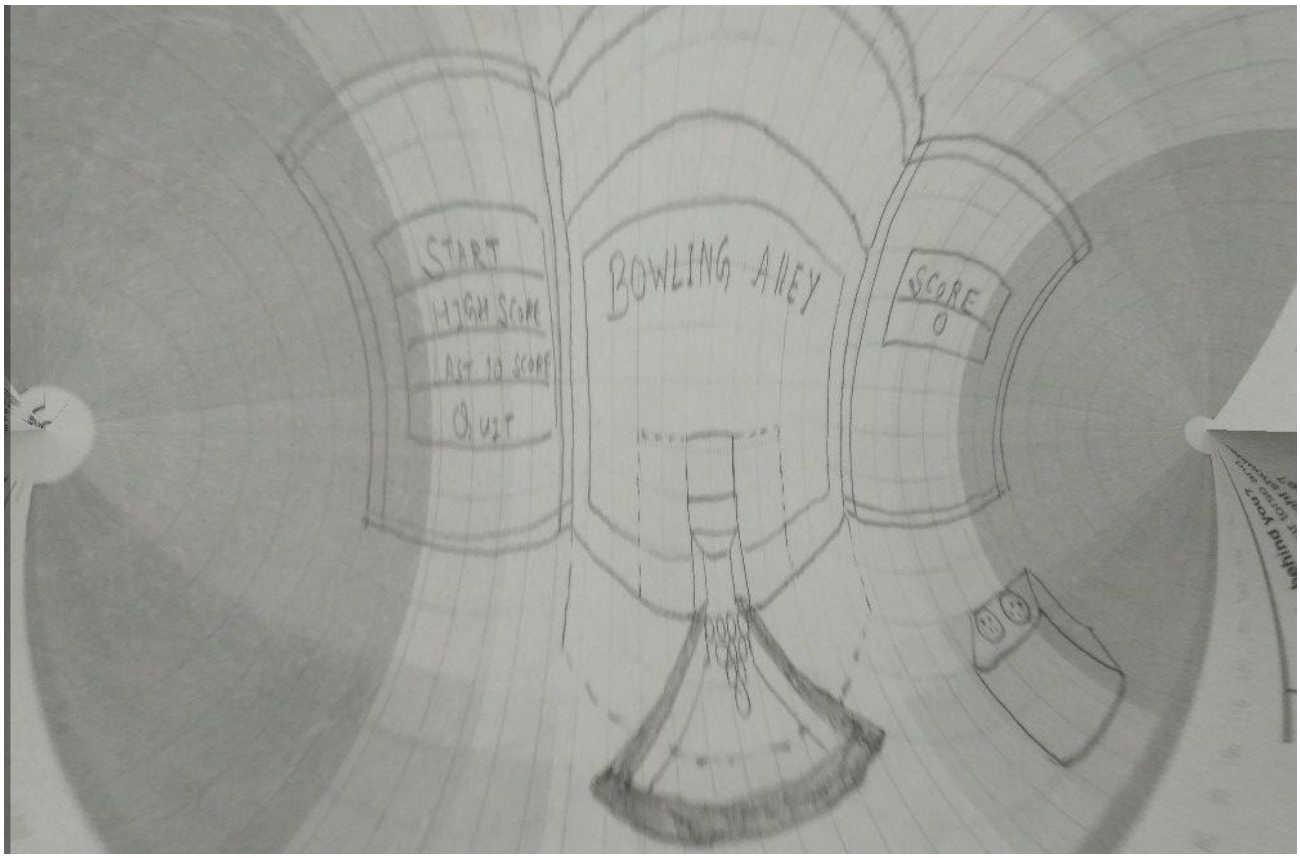
2. Manu's VR Mockup:



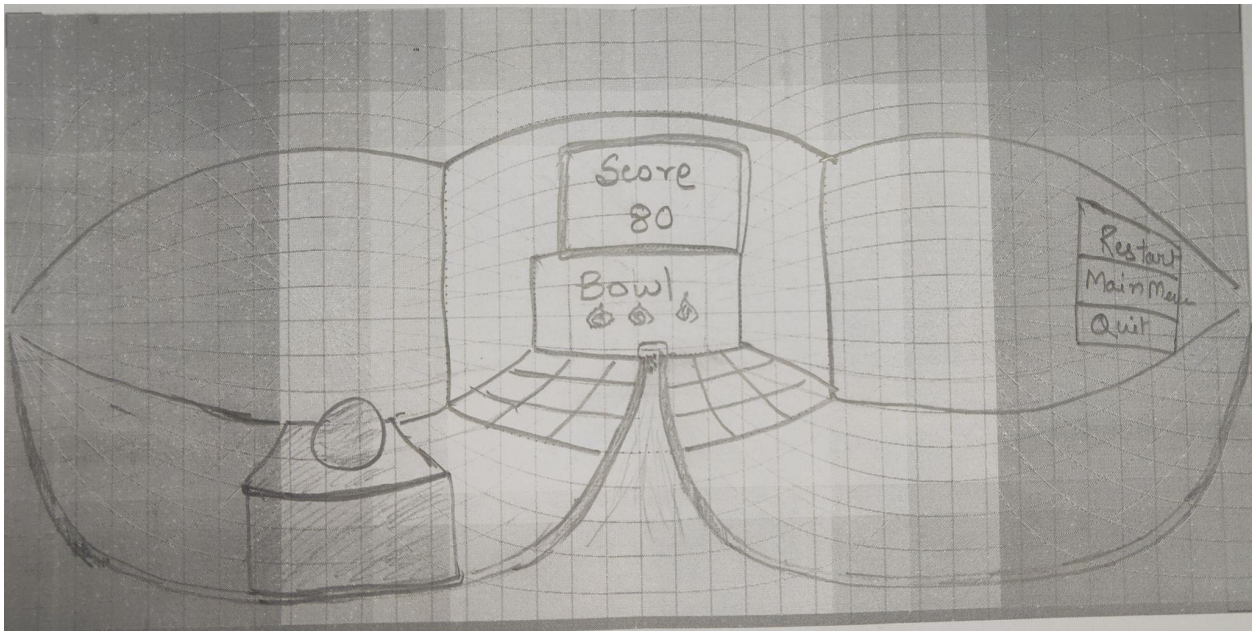
3. Debashish's VR Mockup:



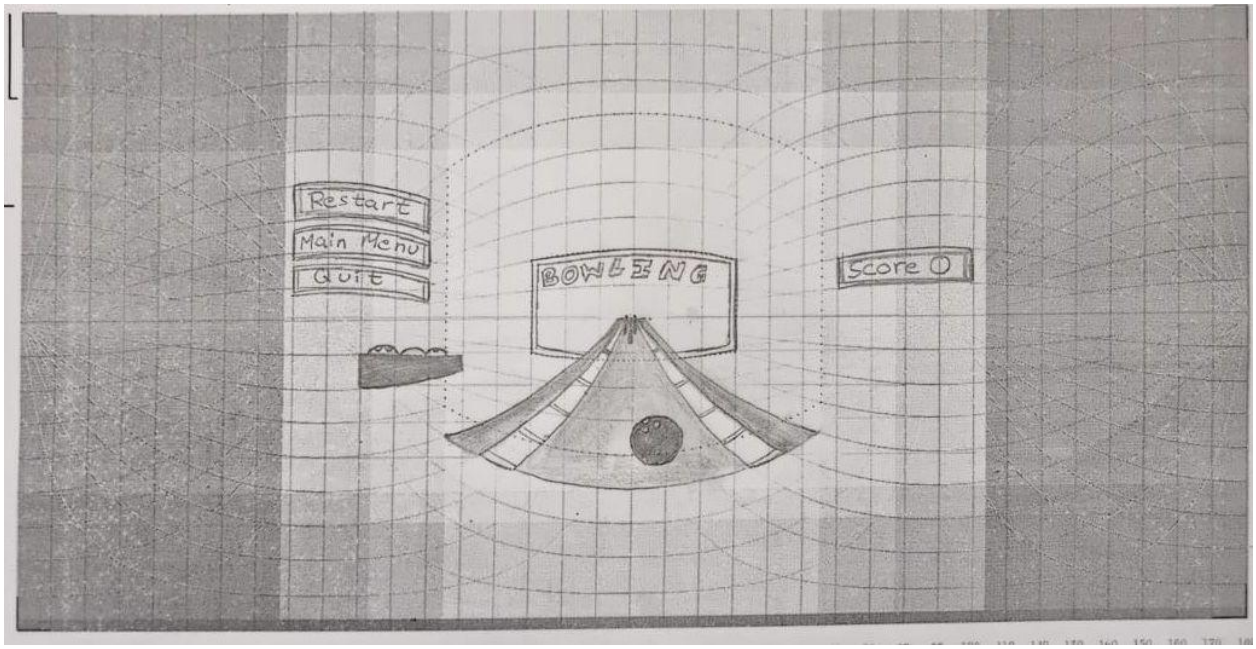
Visualization using VR Media Player



4. **Ramas's VR Mockup**



5. **Ayush's VR Mockup**



The Flow of Events in Order of Action:

S.No	The flow of events in an order of action to be performed by participant
1	In the beginning, the user will get a menu. Users will select one of the options among Start, High Score, Last Score, and Exit.
2	On selecting Start, the user will enter into a new frame, where he/she will play a game and have options like restart, main menu, quit and score will be displayed.
3	For playing the game, there is functionality for picking up the ball and throwing the ball using the controller.
4	Users will get 10 chances to throw the ball, on every throw score will get incremented by the number of pins knocked out, if he/she wants then quit or restart the game in between the game.
5	On clicking Restart, the game will start with 0 score and 10 throws.
6	On clicking Quit, the user will be taken to the main menu.
7	If the user clicks High Score on the main menu, a high score will be displayed with the option to reset the high score and to go back to the main menu.
8	Last Scores on the main menu will take the user to a new screen where he/she will

	get the top ten scores in decreasing order, and these scores are persistent as per the requirement
9	The Last button on the main menu i.e. Exit will take the user out of the game.

Following are screen-shots that we have captured while playing the game:

This is the main menu, where users will select one of the options among Start, High Score, Last Score, and Quit.

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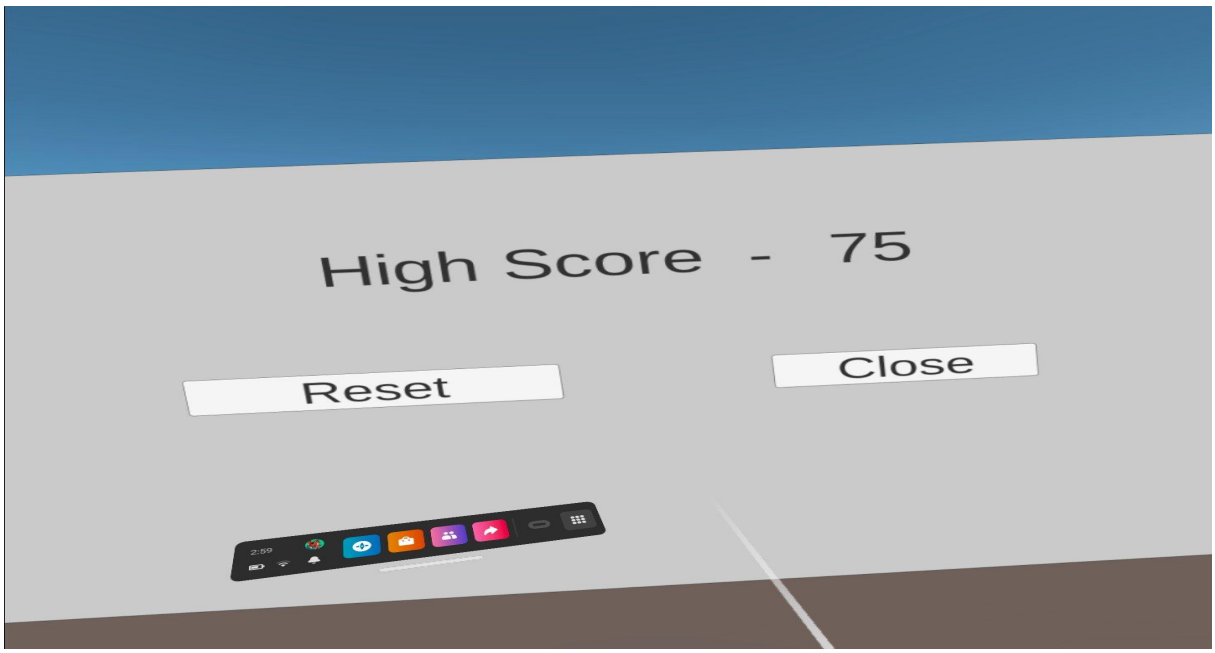
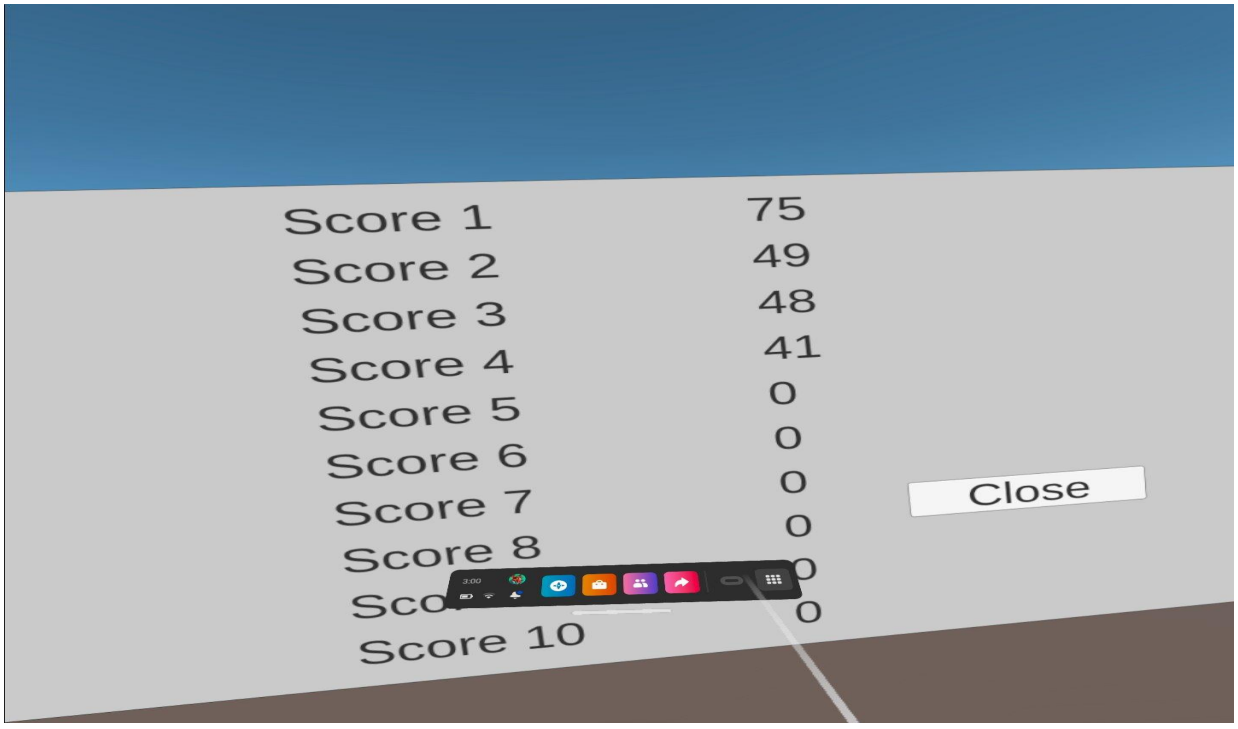
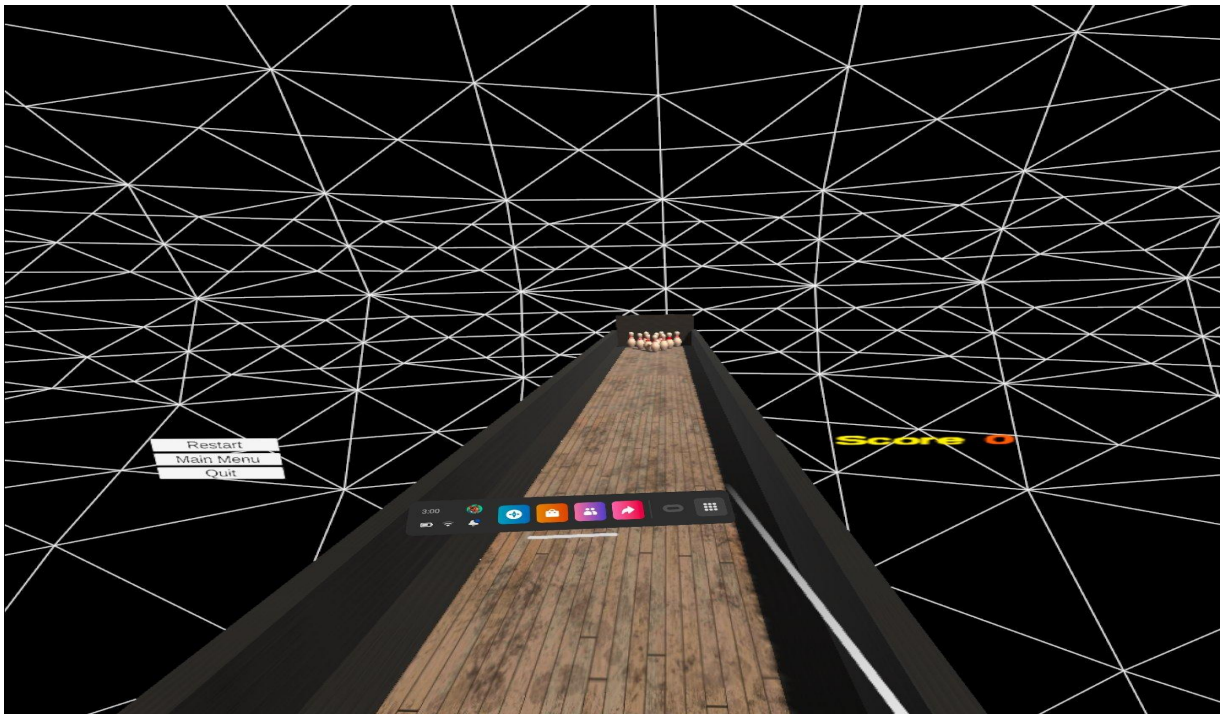
On Choosing a High score following screen will be displayed



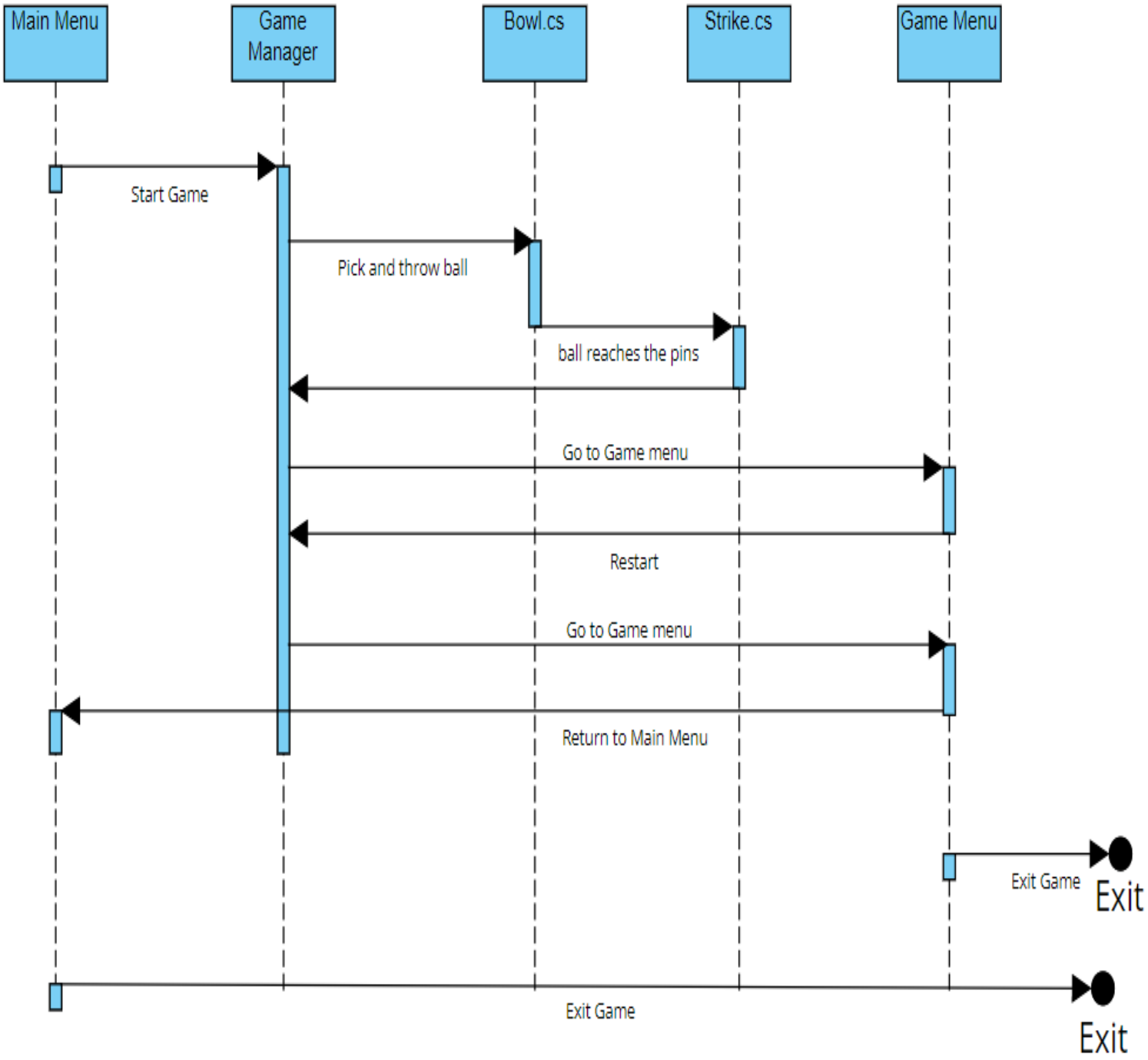
On choosing last scores, 10 top scores will be displayed in decreasing order:



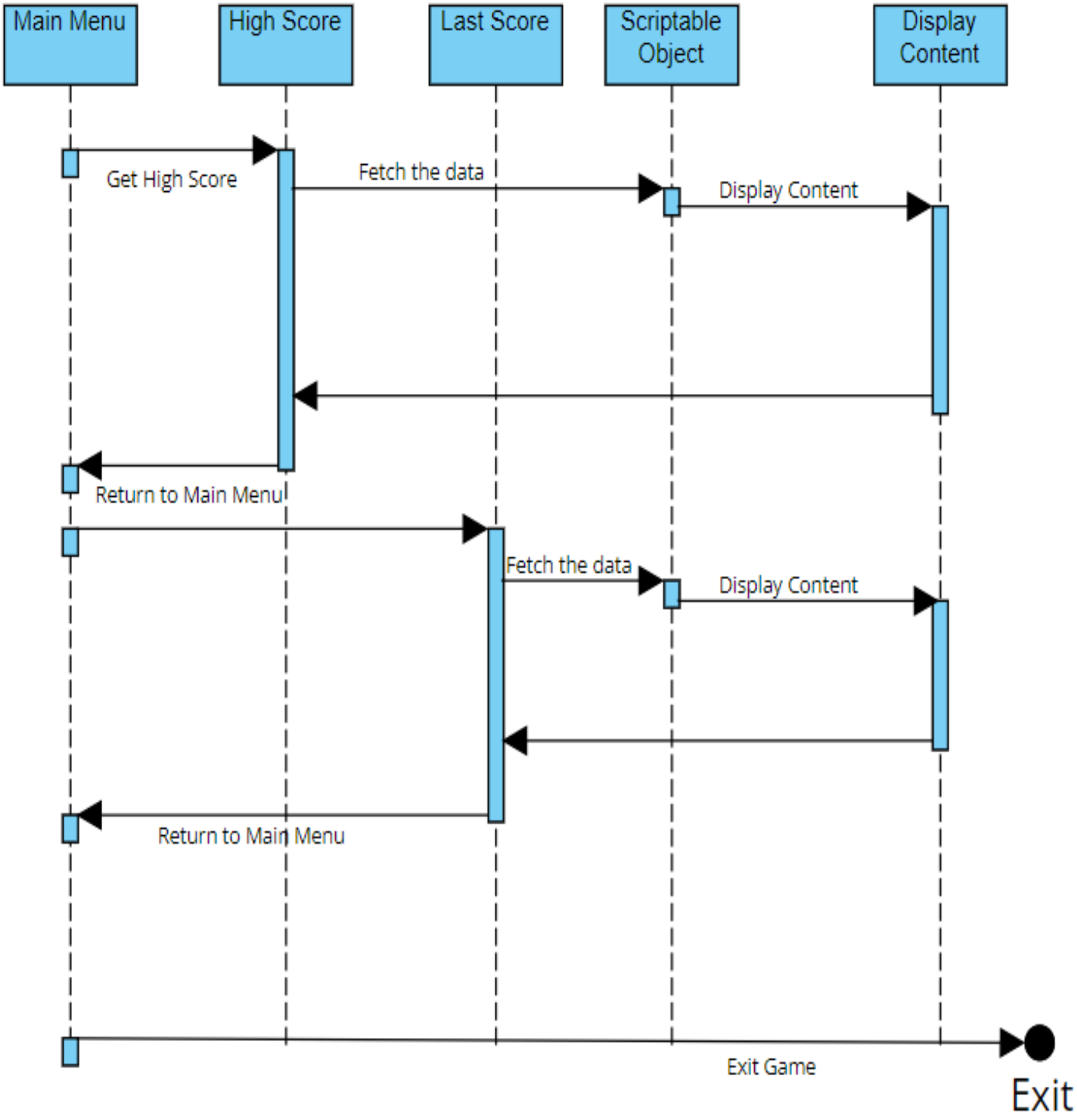


This is the game view, where user will have 10 turns, on each turn user will grab a ball and throw, and the score will be incremented depending on pins down.

Sequence Diagram For Playing Bowling Alley:



Sequence Diagram For Showing Scores:



Misc:

Design:

We first started with making VR mockup screens. We kind of get into a common understanding about the menu, but have conflicting views over the game and scene view parts. So we meet up and choose the VR mockup which is simple and easy to implement as discussed in the “VR screen section”.

Then we started with a game that works on unity as only one member of our team knows VR. So we implemented the game and unity and then later ported on to VR and tested it. Our main focus was on building the project in a stepwise systematic manner, with one step at a time.

Effort planning:

We have an advantage in that one of our teammates has a basic understanding of VR. So rest of the members took time to get acquainted with the unity first. So we collaboratively made a Unity game and test in the Unity environment.

For the VR part, we mostly try to go as a team and test in the Oculus set. We knew that there are 3 sets, so we focused on completing the testing part fast. As later we might have to wait in the queue.

Meeting Minutes:

We have always worked collaboratively on projects. So all the time we have spent comes under meeting minutes.