# UNIVERSITI TUNKU ABDUL RAHMAN
## Faculty of Information and Communication Technology


# UCCD3223 Mobile Applications Development
**(Feb 2025 Trimester)**

# Individual Practical Assignment

| | |
|---|---|
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| **Student ID** | **2105330** |
| **Course** | **CS** |
| **Practical Group** | **P9** |
| **Lecturer** | **Mr.Tan Chiang Kang @ Thang Chiang Kang** |

| Marking scheme | Marks | Remarks |
|---|---|---|
| Correctness | × 2.5 | |
| Design | × 3.5 | |
| User Friendliness | × 2 | |
| Neat Program Documentation | | |
| Report Format | | |
| **TOTAL** | | |

# Contents

# Chapter 1 Introduction to Cool Math Game

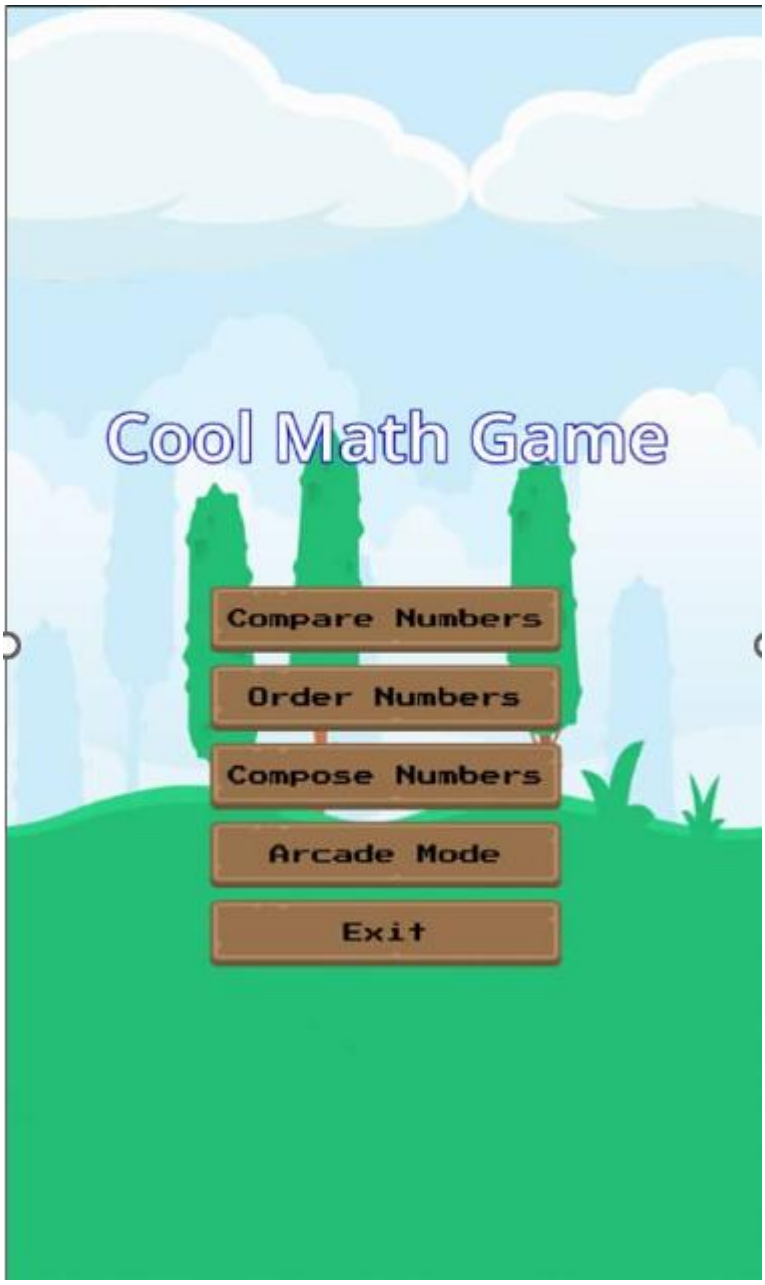
**Introduction**

The game “Cool Math Game” is made using godot game engine. The chosen viewport of the game is 1080x1920 pixels which has an aspect ratio of 9:16. The reason this aspect ratio was chosen it is one of the most popular viewport for mobile applications. The game features four game modes: Compare Numbers, Order Numbers, Compose Numbers and Arcade Mode.

The game source code is available under the github repo link: https://github.com/LiewZhengXian/CoolMathGame.git

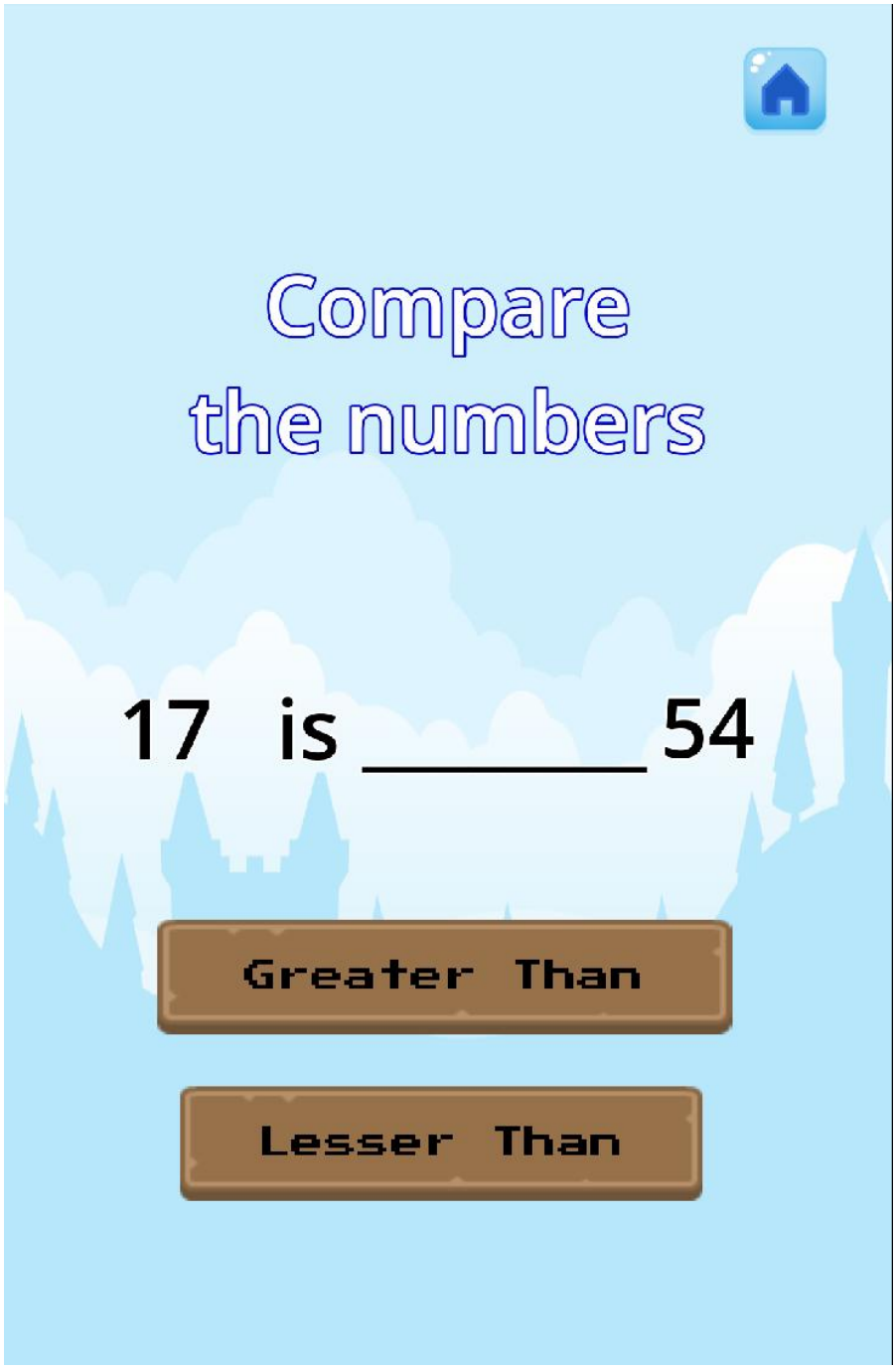
The source code of the game is written in GDScript language stored in the scripts folder.

**Main Menu**

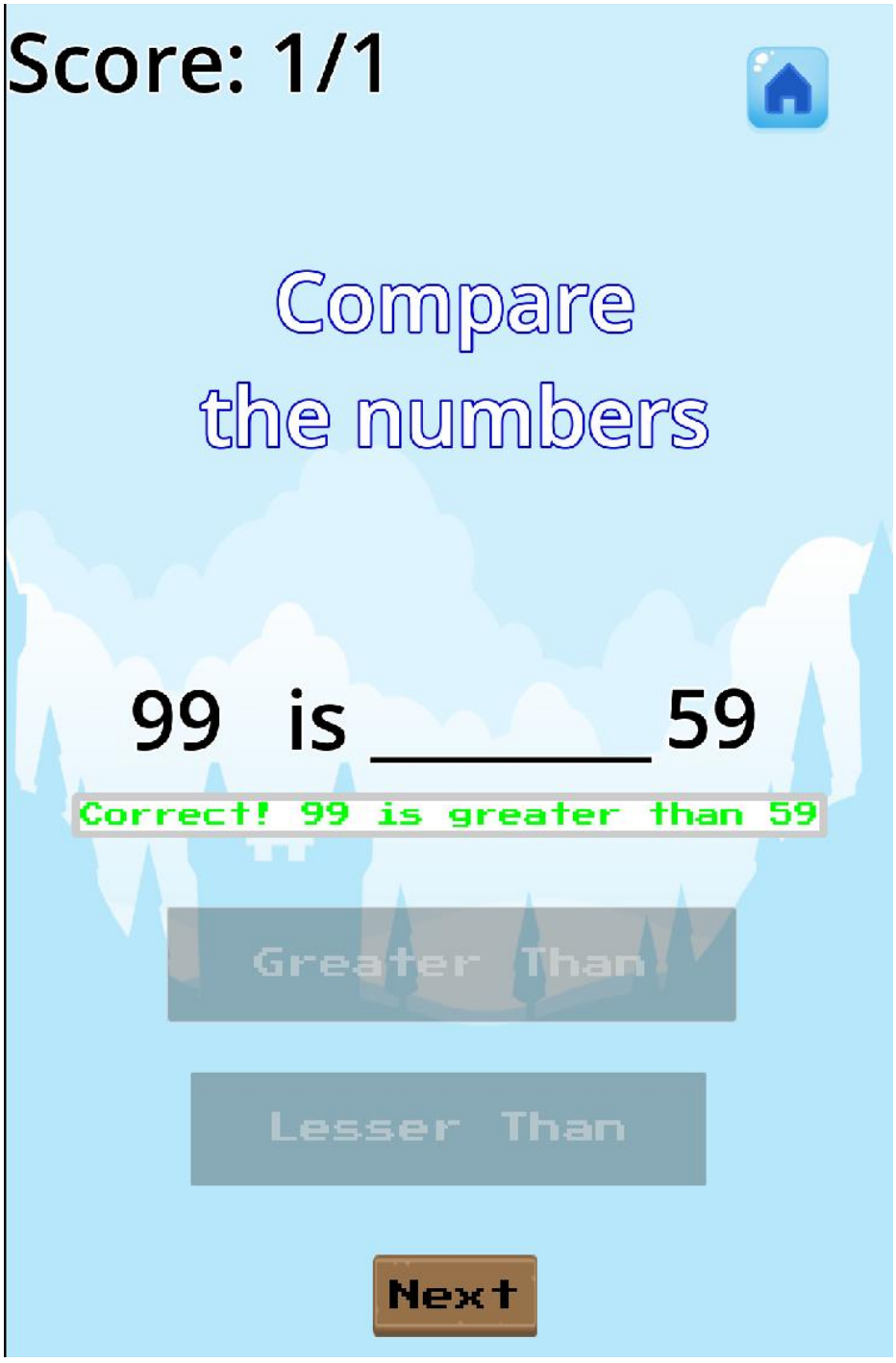



This is the main menu UI for the application. The main menu shows 5 buttons: Compare Numbers, Order Numbers, Compose Numbers, Arcade Mode and Exit. When player exit button, player will quit the application. If the player clicks the other buttons, the app will switch to the corresponding scene to start the game mode. The main menu UI also contains some animations to capture the players attention.

**Compare Number**



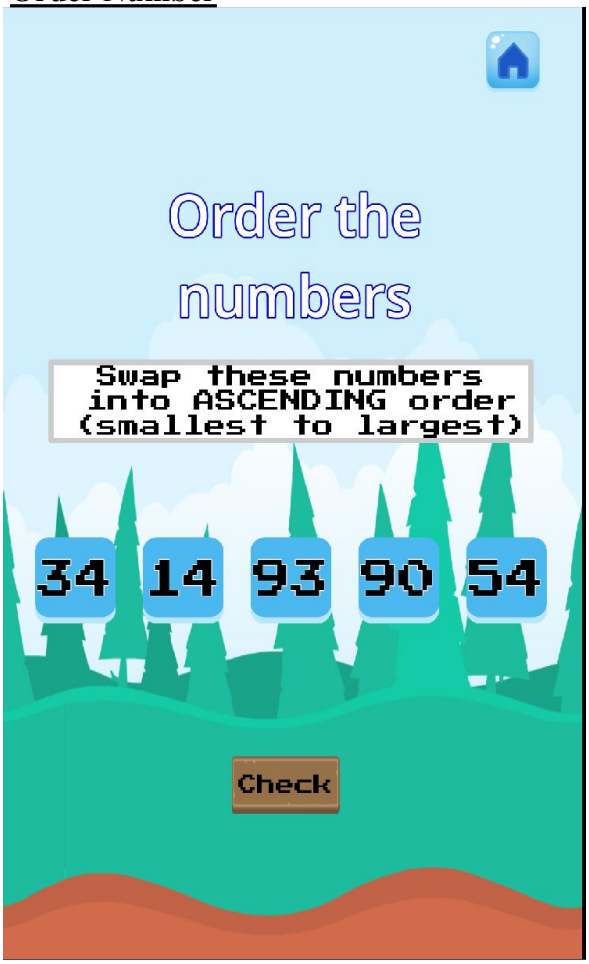

The compare number game mode consists of unlimited round where players have to correctly compare the two randomly generated number on screen. They need to press greater than button if they think the number on the left is bigger than the right and vice versa. The home button is shown on the top right if players wants to exit the game mode.




If the player pressed the correct answer, a result label and next button will be shown to the player. The score will be updated on the top left and shown in this format <Number of correct rounds>/ <Total number of rounds>. If the player is ready to proceed to the next question, they can press the next button.

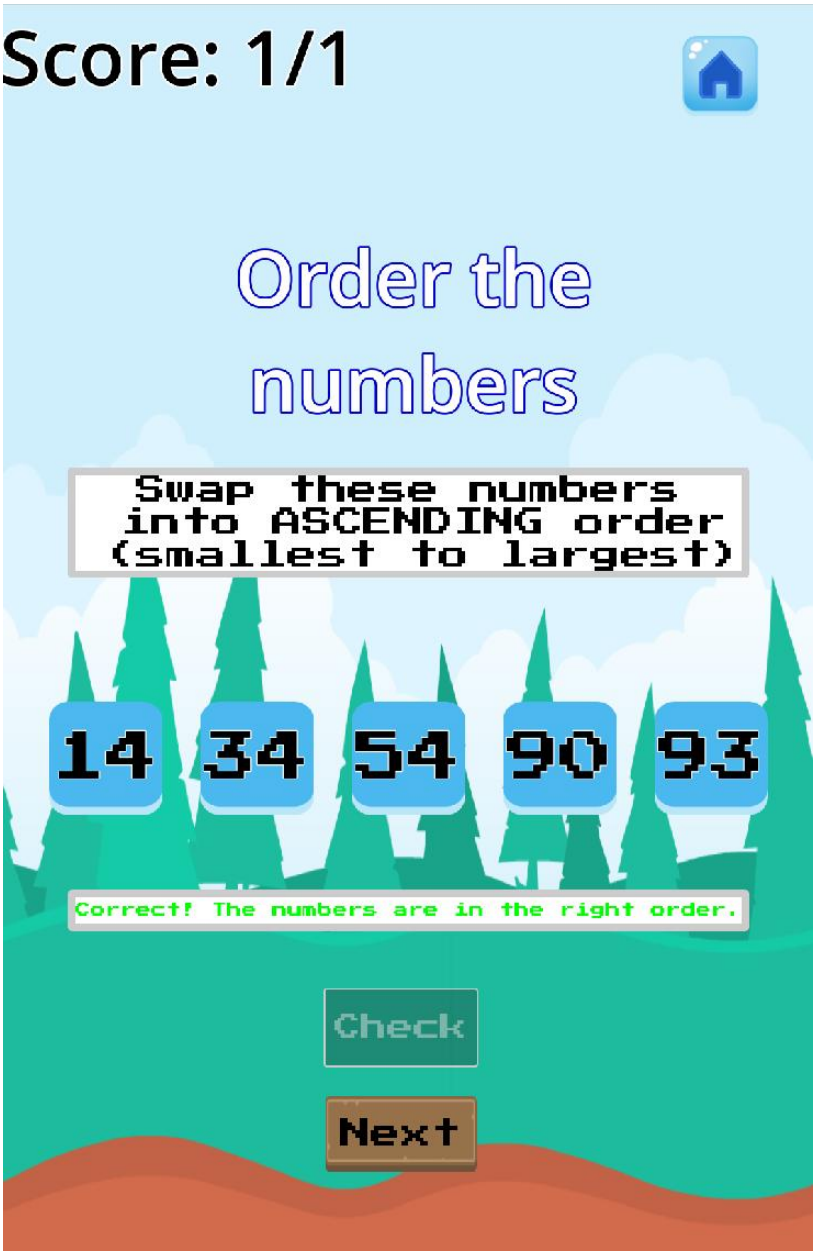

When the player clicks the wrong answer, the result label will show the error text in red, and the score will update accordingly. Player need to press the next button to proceed.

**Order Number**

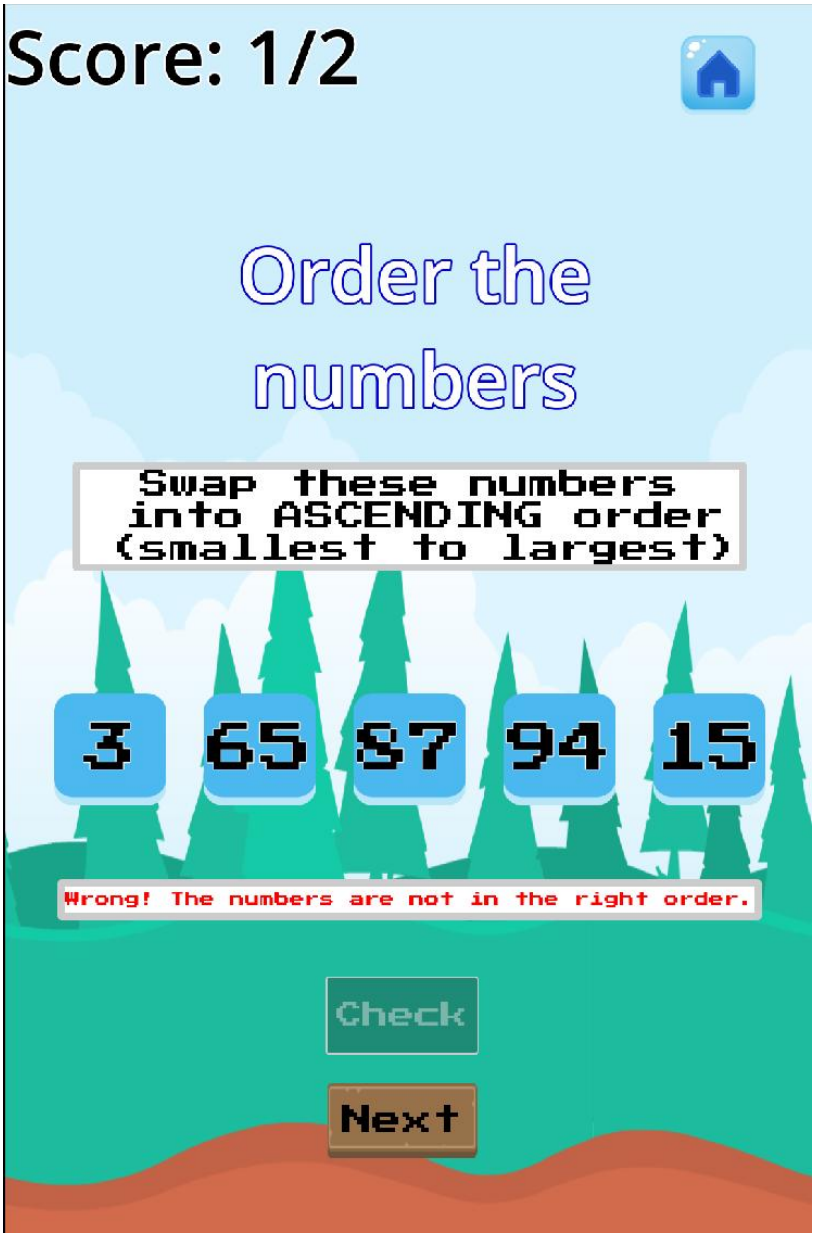




The order numbers game mode consists of unlimited round where players have to correctly order the five randomly generated number on screen in either ascending or descending order. When the round begins, a prompt label will be displayed to tell the player to arrange the number in ascending or descending order randomly. The player must press two button to swap their places. The first button pressed will be highlighted to show that it is the pivot. Once the player is finish arranging, they need to press the check button to validate their answer.




If the player arranges the number correctly the result label will be shown and the score will be updated accordingly. The next button will also be displayed to let player proceed to next round

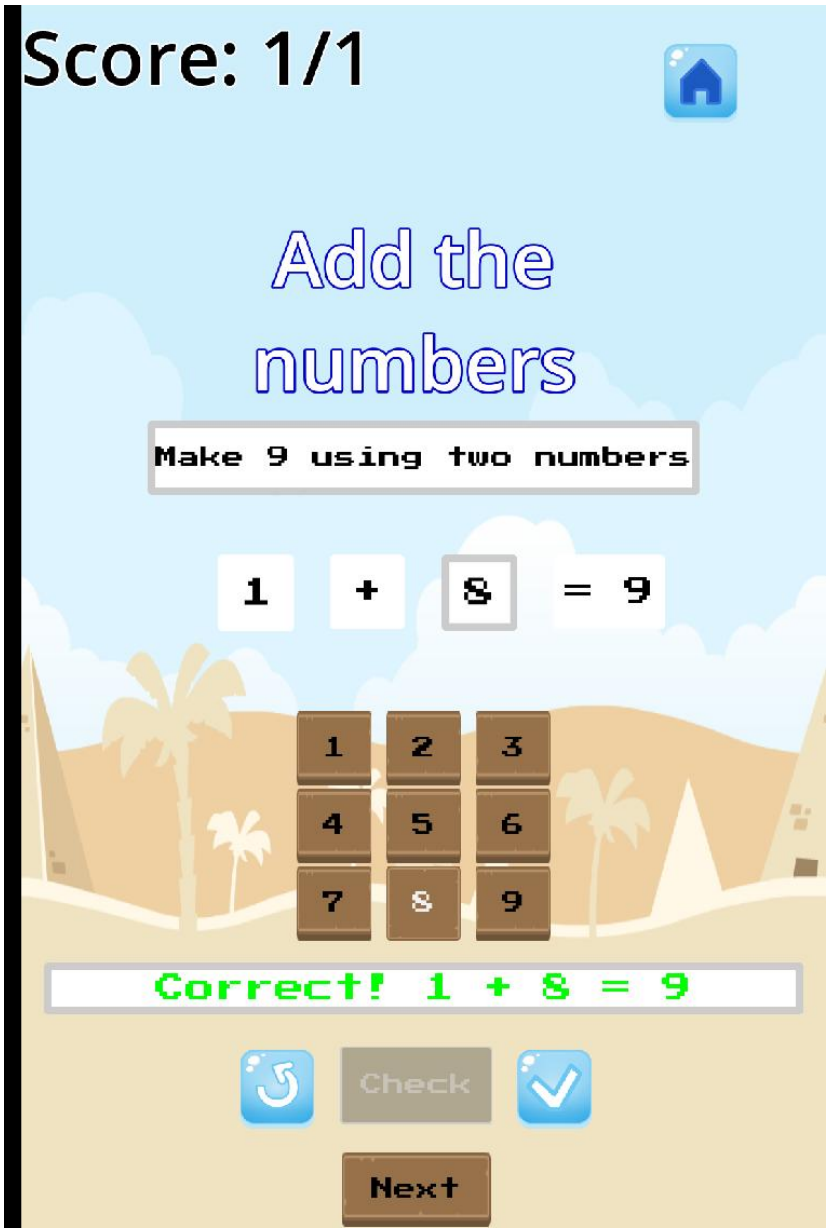



If the player arrange wrongly, the result label will be displayed in red and player can proceed to next round by pressing the next button.

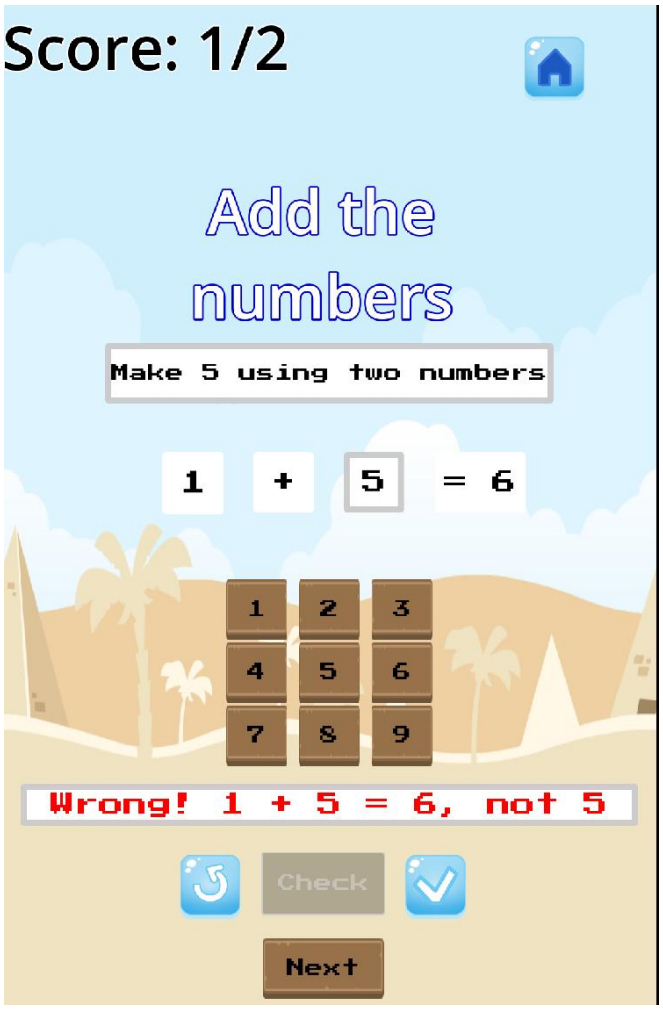
**Compose Number**


The compose numbers game mode consists of unlimited round where players have to compose a randomly generated number with two numbers from 1 to 9. The selected box will display the number if the player presses any of the number buttons arrange in 3x3 layout. The selected box will be highlighted and animated to show that it is the selected

box. Player selects the other box by clicking the tick button on the bottom right. When the player makes a mistake, they can always click the swirly arrow button on the bottom right to reset the boxes. Finally they can check their answer by pressing the check button.

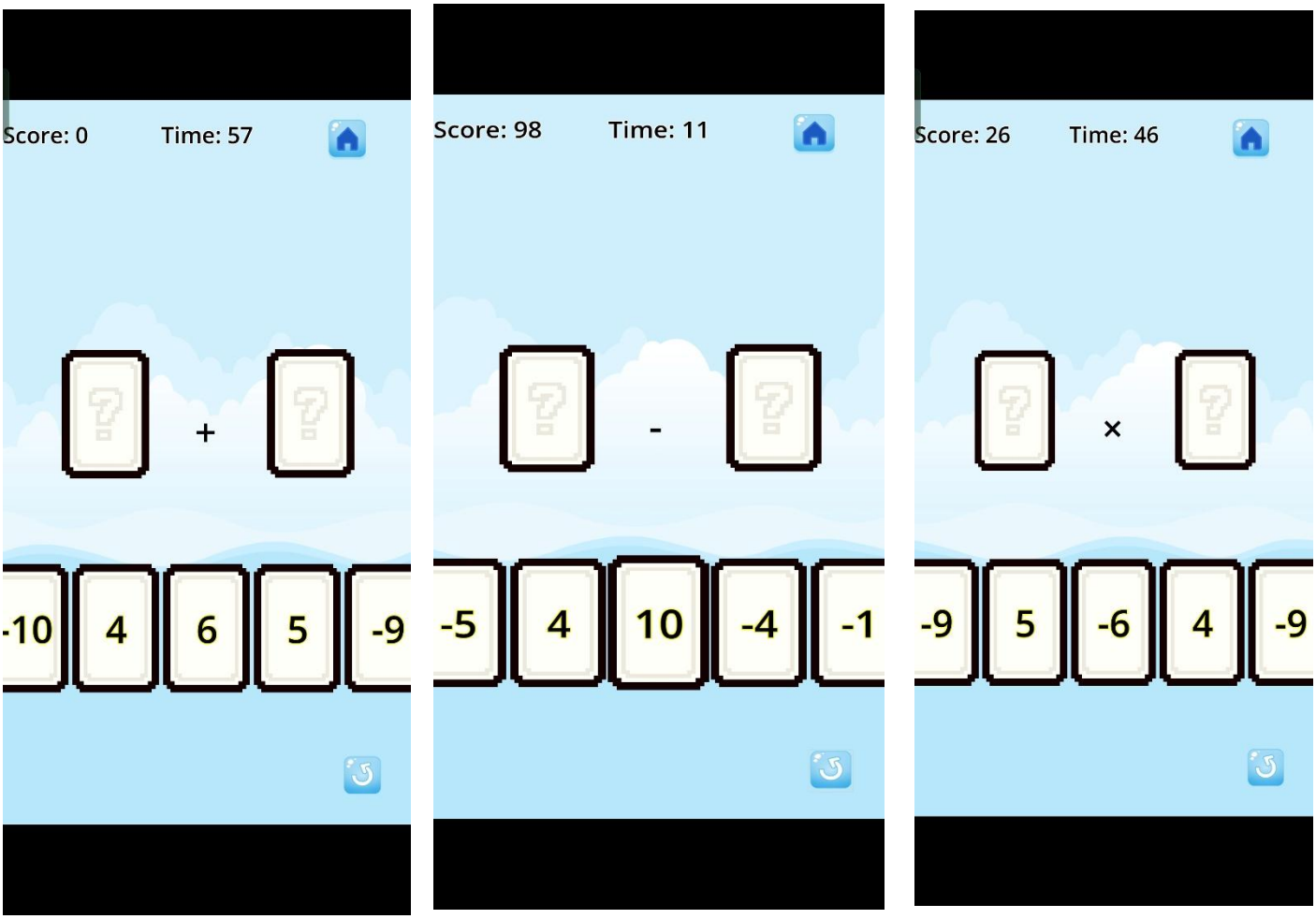



The screenshot above shows the scenario if the player answers correctly. The result label and next button will appear. The score will update accordingly. The box with the '=' sign will also update to show the actual sum of the two numbers. Player can press the next button to proceed to the next round.



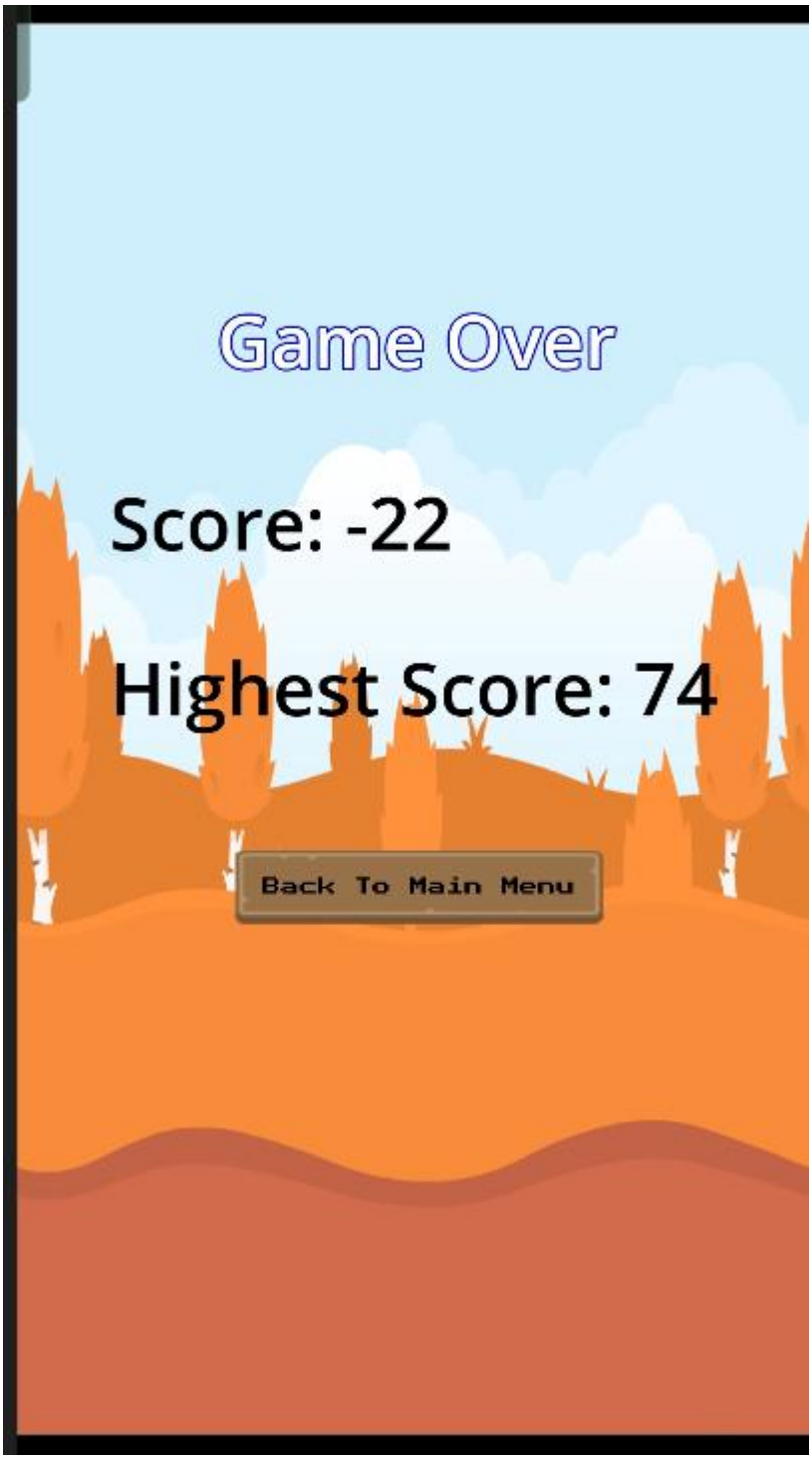

If the player answers wrongly the result label will show the correct answer in red. Score will update accordingly and the player has to press the next button to go to the next round.

**Arcade Mode**




Arcade mode is time trial game mode where players have to attempt to obtain a high score within 60 seconds. The game mode will end once the timer reaches 0 and switch to the game over scene. Players are dealt with five cards with values between -10 to 10 at the start. Every round the player must drag two cards from their hand to the two slots. Once the slots are filled, the round ends and the game will calculate the result of the equation to add to the score. Depending on the cards the score obtain can be negative or positive, so the player is encouraged to strategically choose their cards to avoid penalty and obtain the highest score as fast as possible. In the next round, two new card will be dealt to the player hand. The operation will be display in the sequence +, -,= repeating every three round. The swirly arrow button on the bottom right lets the player redealt one of their cards if they make a mistake.

**Game Over Screen**




This game over scene is only displayed at the end of the arcade game mode. The scene shows their current score and the highest score they obtained before. The highest score is

store in the following file path : “user://savefile.dat”. The highest score will be updated if the current score is higher. The back to main menu button is shown to let player go back to the main menu to select their next game mode.

## Chapter 2 Conclusion

**Limitation and Future Work**

The limitation I encountered during the development of the game is dealing with the viewport on different devices. Future work can be done to make the display responsive to

devices of different viewport. Another limitation is I cannot design my own assets to better suit the theme of my game due to time constraints. The assets used are obtained from open-source community and lack the customization I need to make implement the best UI design for my game.

## Credits

Assets by danimaccari
Website: https://dani-maccari.itch.io/

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