

## 1.1 Purpose:

This project will entail creating a proof of concept (POC) “Competitive Coin Counter” game. The Money Museum here at the FRBKC already has a game in which visitors use pictures of coins to compete against each other to add up to a designated amount. This is a simple but highly competitive game for visitors of all ages.

## 1.2 Scope:

### *The Game Concept:*

The game will involve matching coin cards (groups of coin images) with a given value. The sum of the value of the coins on the chosen coin card must match the given value for the player’s answer to be correct. A player receives points for every correct answer.

To make it more difficult and to keep the game moving, a timer will limit the amount of time a player can take to submit his or her answer. The difficulty level of the game will increase as the player continues to get correct answers. The difficulty level is increased by the increasing the number of coins on a coin card, decreasing the amount of time on the timer, and adding obscure coins.

### *About Points:*

Points are calculated by adding the time remaining on the timer, a correct answer point (C), and a consecutive answer bonus (B). For example, if the player answers correctly with 25 seconds remaining on the timer, the player’s points would be  $25 + C + B$ . The consecutive answer bonus will be increased with each consecutive correct answer.

### *Single Player:*

When the player chooses the single player option, the game is launched with no additional setup. A set of five rounds is generated randomly at the easiest difficulty level. At the end of five rounds, the player will be presented with his or her score and prompted to continue or exit the game. If the player has answered three or more of the rounds correctly, the difficulty level is increased for the next five rounds.

### *Multiplayer:*

For multiplayer, the host player must challenge an opponent to the game. A challenge ID will be generated so that the opponent(s) can join the game. When the opponent(s) have joined, the host player can begin the game. The players will be presented with the same rounds to answer within the same time limit. As with single player, the difficulty level will increase as the players answer correctly. If each of the players has answered three or more rounds correctly, the players will be advanced to the next difficulty level.

The first player to answer in a round will wait for the opponent to answer (or the timer to run out). If one (or more) of the players have answered correctly, the game will reveal the correct answer and move on to the next round. If neither of the players has answered correctly, the game will repeat the round until someone gets the right answer. At the end of five rounds, the players' scores will be displayed and the players will be prompted to continue or exit the game.

### ***Goals and Objectives:***

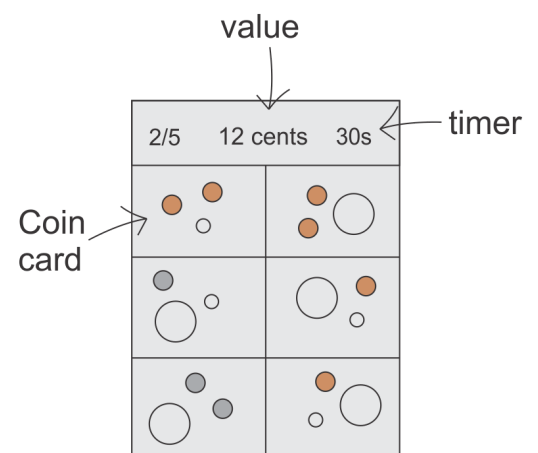
The goal of this game is to allow players to develop an understanding of the value of coins in a competitive and engaging way. The main objective in the game is to quickly match the correct coin cards to the given value. By competing in this game, players will need to correctly count the value of a group of coins and compare it to the given value.

### ***The Application Will Not:***

The game will not store the players' names, devices, or device names. The game will not share the players' information with other players.

## 1.3 Definitions

- A coin card - a group of coin images, which when added together will have a coin card value.
- A round - consists of six coin cards, with only one correct coin card that corresponds to the given value, and a timer.  
(Figure 1.1)
- A challenge - A challenge is a set of levels for users to play.
- Host player - The user who begins a multiplayer challenge.
- Opponent - The user who joins or opposes a host player in multiplayer mode.
- Level - A level is a set of five rounds with the same difficulty level.
- Difficulty level - is determined by the number of coins on a coin card, the time per round, and the type of currency. More difficult levels will have more coins on a coin card, less time per round, and possibly obscure currency.

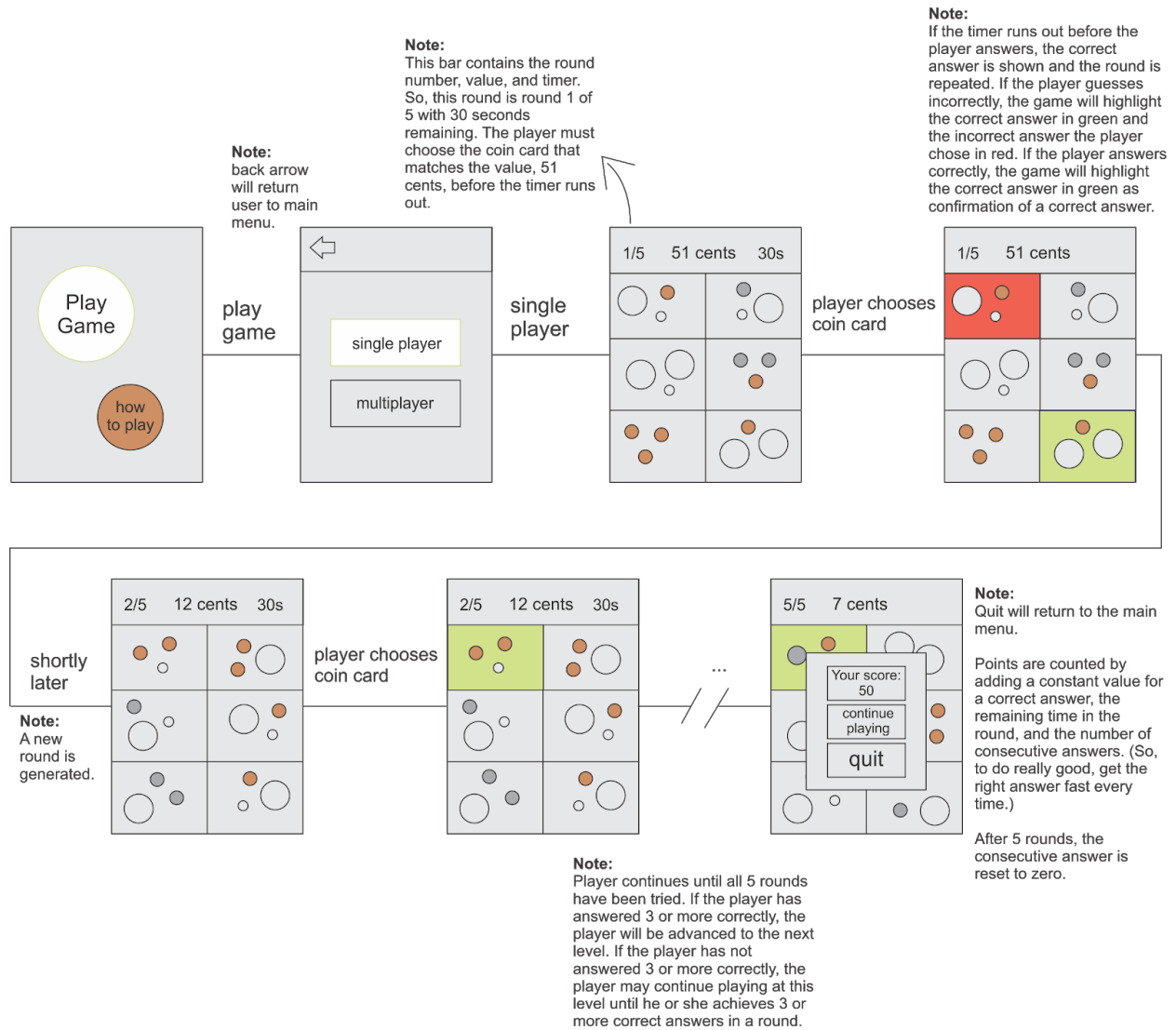


(Figure 1.1 - A Round)

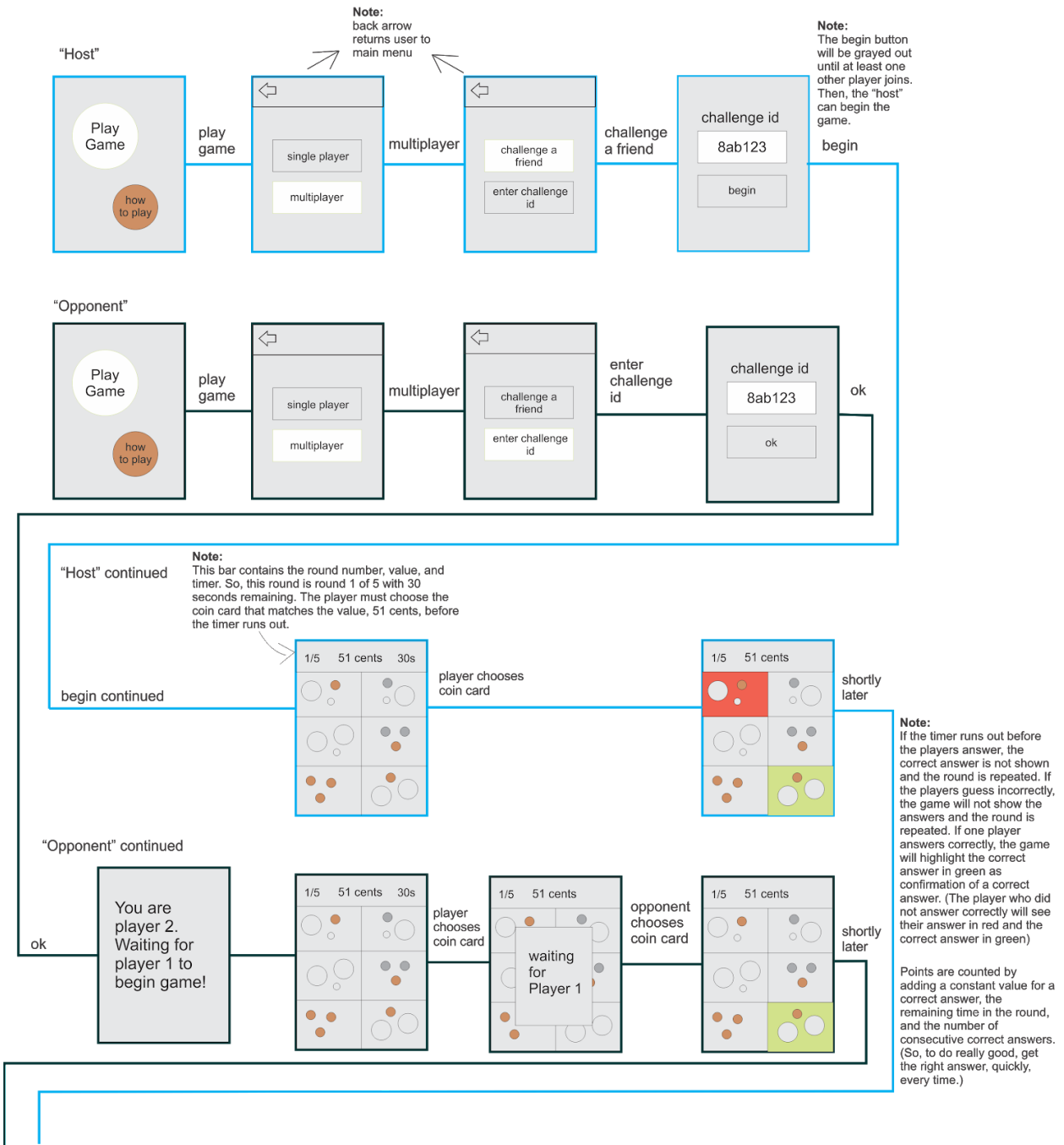
## 2 Specific requirements

### 2.1 External Interface Requirement

#### *Single Player Interface:*

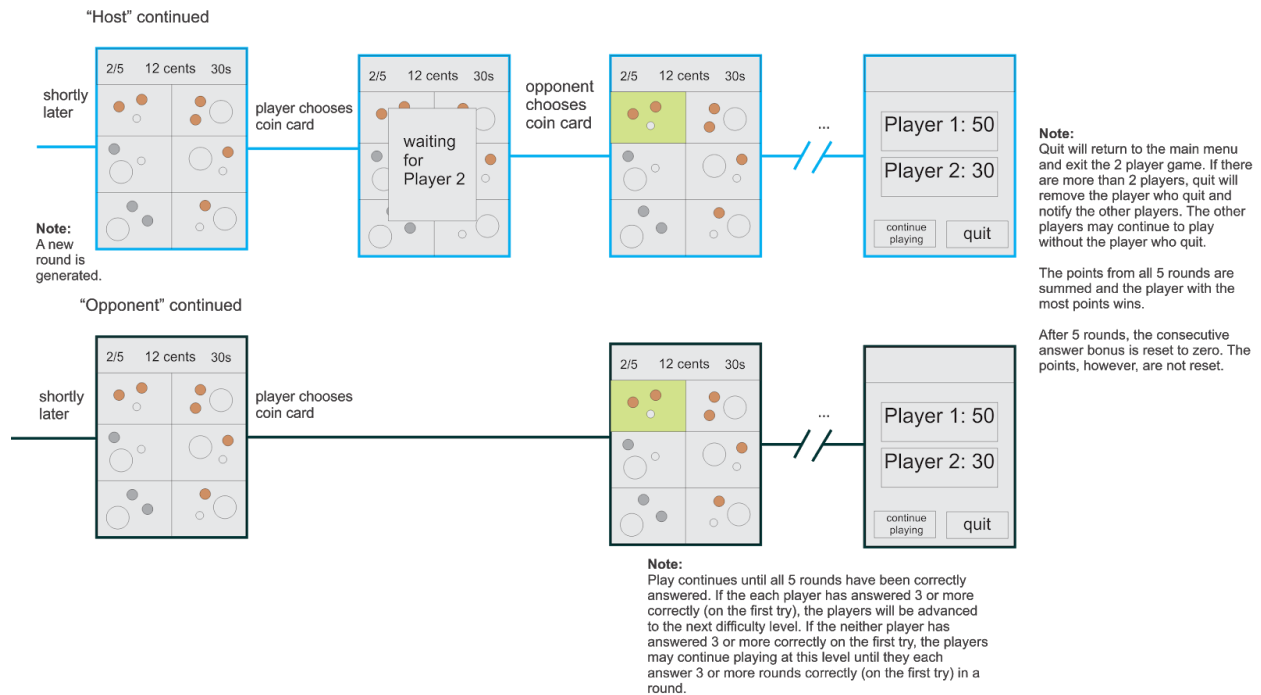


## Multiplayer Interface:



(Multiplayer continued on next page)

## (Multiplayer continued)



## 2.2 Functional Requirements

ID: R0.1

Name: Play Game Button

Dependency: None

Description: The application shall prompt the user to choose between single player, multiplayer, or quit (return to menu).

ID: R0.2

Name: How to Play Button

Dependency: None

Description: Takes the user to a static page explaining the mechanics of the game, how points are calculated, and how to win.

ID: R0.3

Name: Contact Us Button

Dependency: None

Description: Takes the user to a page where the user may provide comments and feedback about the game, bug reports, or future ideas.

ID: R1.1S

Name: Single Player Button

Dependency: R0.1

Description: The application generates a level (set of 5 rounds) for the user to play at the beginner difficulty. The game begins immediately.

ID: R1.2S

Name: Click Coin Card Single Player

Dependency: R1.1S

Description: The application checks that the answer is correct. If the answer is correct the application shall show their answer is correct by highlighting the box green, add to the consecutive bonus count, and continue to the next round.

Alternate: If the answer is incorrect, the application shall repeat the round until the user gets the correct answer. If the user cannot get the correct answer after 3 tries, the game will show the user the correct answer.

ID: R1.3S

Name: Completion of Level Single Player

Dependency: R1.2S

Description: Following the completion of a set of 5 rounds, the level is complete. The user will be notified of their score and performance in the level and given a choice to continue playing or quit. Quit will return the user to the menu. Continue will generate and begin another level for the user either at or above the difficulty level completed depending on their performance.

ID: R2.1MP

Name: Multiplayer Button

Dependency: R0.1

Description: The application shall give the user a screen with three buttons to choose between challenging a friend, entering a challenge id, and quitting (returning to the main menu).

ID: R2.2MP

Name: Multiplayer Challenge a Friend

Dependency: R2.1MP

Description: The application shall create a challenge for the user and an opponent. In this screen, the host is notified of their challenge ID (challenge ID) and is able to give this to the user.

Additionally, there is a begin button that is greyed out until an opponent joins the host player using the challenge id.

ID: R3.1MP

Name: Multiplayer Accept Challenge ID

Dependency: R2.1MP

Description: The application shall prompt the opponent for the challenge id from the host player, validate the challenge id, and enroll the user under an assigned name, depending on how many players are playing. For example, the host player will be Player 1, and the next opponent to join will be Player 2, the next, Player 3, and so on. The begin button is also enabled for the host player.

ID: R3.2MP

Name: Host Begin Button

Dependency: R2.1MP & R2.2MP & R3.1MP

Description: The application generates a level (set of 5 rounds) for the users to play at the beginner difficulty. The game begins immediately on all the players' screens in the same round.

ID: R3.3MP

Name: Click Coin Card Multiplayer

Dependency: R3.2MP

Description: The application checks the answer. If the answer is correct, the game will compute this player's points, updating the consecutive bonus accordingly. If the answer is incorrect, no points are awarded and the consecutive bonus is reset. If the other player(s) have not yet submitted their answers, this player will be notified that you are "waiting for your opponent."

ID: R3.3.2MP

Name: The Other Player Submits Answer

Dependency: R3.3MP

Description: If one or more players answered the round correctly, the correct answer will be revealed. If both users are wrong, the players will play the same round over again.

ID: R3.4MP

Name: Completion of Level Multiplayer

Dependency: R3.3MP

Description: Following the completion of a set of 5 rounds, the level is complete. The users will be notified of their scores, standing versus each other, performance in the level, and given a choice to continue the challenge or quit. Quit will return the user to the menu. Continue will inform the other players that the game will continue. The game will generate the next 5 rounds at or above the difficulty level of the current level, depending on players' performance.

ID: R3.5MP

Name: Multiplayer Challenge Ends

Dependency: R3.2

Description: The application will return the players to the main menu.

ID: R0.2

Name: Back Arrow

Dependency: R0.1, R1.1S, R2.1MP, or R3.1MP

Description: Returns the user to the main menu.