Requirements and Analysis Document for KahIt

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Contents

1 Introduction

KahIt is an application developed for the android operative system and is meant to be run on either a phone or a tablet. It is a quiz application that is closer to a party game. It can be played with friends in a multiplayer mode, with one player acting as host or it can be played locally on one device. When hosting a game friends can connect using *Nearby Connections* with up to 8 players. *KahIt* is designed to have items that can boost the player's score or reduce it. *KahIt* provides a verity of cosmetic items that do not affect players status but are shown for other players.

1.1 Definitions, acronyms and abbreviations

- Hotswap: A game mode were a multiplayer game is played on one device by rotating the active user and letting them preform one action per rotation, resulting in a multiplayer experience that only requires one device.

2 Requirements

2.1 Epics

As a: person who likes to have fun with friends I want: a way to challenge their knowledge in a fun and enjoyable way since the old way with cards are boring and limited.

As a: user I want: to play a quiz-like party game since I need something fun to do with my friends.

As a: Host I want: to have the setup time for a game to be quick and easy, so it does not become cumbersome.

As a: user I want: to be able to set up a game with my friends because it's more fun to play with them than with strangers.

2.2   User Stories

Story identifier: sFQuestionl
Story name: The first question
Status: Completed

As a: user I want to: answer a multiple choice question because answering questions is fun.

Functional Confirmation:
- A questions is provided to the user and the user can answer it.

- The user can choose between (4) alternatives of possible answers.

- The user is notified if their answer is correct or incorrect.
Non-functional Confirmation:

- The whole question is visible no matter the size of it.

Story identifier: sMQuestions
Story name: More than one question
Status: Completed

As a: user I want to: be able to answer more than one question because only one question is not enough for the game to be fun.

Functional Confirmation:

- After answering a question a new one should be provided.

- A group of question should of the same category.

- The new question should not be a question that has already been answered. Unless all questions of that category have been answered.

Non-functional Confirmation:

- There should not be a long load time between the different questions.

Story identifier: sHGame
Story name: Host a game
Status: Completed

As a: user I want to: be able to host a game so that my friends can join.

Functional Confirmation:

- The host does not have to provide any extra information except a possible password to setup a game.
- The host can remove players from the "lobby".

Non-functional Confirmation:

- Hosting a game should be low effort.
- Hosting a game should not take too much time.

Story identifier: sJGame
Story name: Joining a game
Status: Completed

As a: user I want to: be able to join a game that someone else is hosting because playing with someone is more fun than playing alone.

Functional Confirmation:

- The app searches for a "room" and when it finds a game it populates a list for the user to pick.
- The user is only connected if they pick one of the entry's in the list.
- The user can leave the "room" and terminate the connection at any point.
- When the user is prompted they are given some sort of identifying info about the game/room they are about to join.

Non-functional Confirmation:

- Joining a "room" should require very few steps.
- Connecting to a host should not take too long.

Story identifier: sHotSwap
Story name: Hot swap
Status: Completed

As a parent I want all of my children to be able to play on the same device because it's too expensive to get all of them their own phones.

Functional Confirmation:

- The game has a "Hot swap" mode where you can select the amount of players at the start and subsequently play on one device.

- The game rotates the active user allowing all player to participate in the game.

- The game adapts the different game modes to the single device limitation.

- All local players are given the same question.

Non-functional Confirmation:

- None

Story identifier: sStartGame
Story name: Start a multiplayer game
Status: Completed

As a: host I want: to be able to start the game because that is why I am hosting it in the first place.

Functional Confirmation:

- When the user starts the game it should start for all connected users.

- The game should not start until the host has chosen to start it and all users have chosen that they are ready.

- The game should show the same questions to all users.

- The game should not move on from a question until all users have provided an answer or the time has run out.

- If a user disconnects from the game, the game should continue unless the player that left was the host. If the host leaves the game all other users should be disconnected.

Non-functional Confirmation:

- All delays and slowdown should be avoided.

Story identifier: sUsingPowerUps
Story name: Using power ups.
Status: Completed in hotswap, Partially completed in multiplayer

As a: user I want: to Be able to use power-ups and bonuses on questions if i'm sure i know the answer since I like games that are tactical.

Functional Confirmation:

- A player will be able to buy power ups with points earned through answering correctly.

- A power will last for a limited period only ex. three question rounds.

- A player can only buy a certain power up once.

Non-functional Confirmation:

- None

Story identifier: sLeaderBoards
Story name: Leader boards
Status: Completed

As a: user I want: to continually get an update on whom is in the lead since It can be hard to keep the score in my head.

Functional Confirmation:

- After each question the players will be able to see a list of the players with their amount of points and their placement.

- The players in the leaderboard are sorted after the amount of points the players have.

Non-functional Confirmation:

- None

Story identifier: sLottery
Story name: Lottery
Status: Partially completed in hotswap, Uncompleted in multiplayer

As a: player I want: to have power ups and bonuses that reward good players since it makes the game more interesting and competitive.

Functional Confirmation:

- When answering correctly a player will have more chance to win power ups which will protect the players placement and take it even higher increasing the points earned per question.

- A working lottery that distributes winnings to all players.

Non-functional Confirmation:

- The lottery process is good looking and immersive.

Story identifier: sCosmetics
Story name: Cosmetics
Status: Partially completed in multiplayer since players can buy cosmetic items but they are not synced so that other players can them. Completed in hotswap

As a: User I want: to be able to buy cosmetics in game since it makes the game cooler.

Functional Confirmation:

- The user will be able to buy cosmetics such as icons or special colors to stick out when being high on the leader-board.

- The cosmetic items do not give any advantage in game but it adds character and customization to the game.

Non-functional Confirmation:

- None

Story identifier: sLotteryDraw
Story name: Lottery draw
Status: Uncompleted in multiplayer, Completed in hotswap

As a: player I want: to get some randomized items from the lottery.

Functional Confirmation:

- All the players will be able to get a random item each time the lottery ends.

Non-functional Confirmation:

- None

Story identifier: sName1
Story name: Name selector
Status: Completed

As a: user I want to: be able to set my own custom player name (just as you do when e.g. bowling) since it makes it even more fun.

Functional Confirmation:

- The user can choose a name before the game starts.

- The users name is displayed on various "score screens" etc.

- The username has a character limit, as not to mess up the layout.

Non-functional Confirmation:

- None

Story identifier: sMusic
Story name: Background music
Status: Completed

As a: user I want: to be able to have background music because it makes the game more interesting.

Functional Confirmation:

- Some kind of music starts playing when the user opens the app.

- Some kind of music starts playing when the user changes the category.

Non-functional Confirmation:

- The music is suitable for the application.

Story identifier: sToggleMusic
Story Turn off sounds
Status: Partially completed

As a: user I want: to have the option to turn off background music because sometimes it can be distracting and annoying.

Functional Confirmation:

- There exists a function that allows the user to turn off the music.

- The preferred setting is saved between app sessions.

Non-functional Confirmation:

- You should intuitively be able to find the place where you can turn off the music.

Story identifier: socialInteract
Story name: Social Interaction
Status: Uncompleted

As a: user I want to: The game should force players out of the couch in some way since a plain quiz can be to boring for a party.

Functional Confirmation:

- The game has at least one game mode where at least one player has to get up and do something e.g. "pose" in front of a camera.

Non-functional Confirmation:

- The game should be fun and players should laugh.

Story identifier: sTieCase
Story name: Tie case
Status: Uncompleted. The games goes on as long as the players wish therefore a tie case never occurs if the players choose to continue playing.

As a: competitive person I want: there too be an extra round if two players have the same score because THERE CAN ONLY BE ONE WINNER!!!!

Functional Confirmation:

- In a case of tie the game goes into sudden death mode where a player wins as soon as the player is ahead of the other player.

Non-functional Confirmation:

- None

Story identifier: sQuit1
Story name: Quit
Status: Uncompleted

As a: user I want to: be able to quit the game and get a winner since sometimes I want to stop playing and do something else.

Functional Confirmation:

- The game has an "escape hatch" available: during or after questions or after "rounds".

- Host and player can both use the function.

- A Score screen is displayed for the one who left.

- If two players are left and another player uses the function a score screen is displayed for both.

- If a player leaves other users are notified and asked whether or not they want to continue.

Non-functional Confirmation:

- None.

Story identifier: sDifficulty1
Story name: Difficulty selector
Status: Uncompleted

As a: child I want: to be able to set the difficulty of the quiz because some of the questions are to hard for me.

Functional Confirmation:

- The user can choose the difficulty of the quiz at the beginning.

- The questions given during the quiz are not harder then the given limit.

Non-functional Confirmation:

- None.

Story identifier: sPause
Story name: Pause
Status: Uncompleted

As a: user I want: to

Functional Confirmation:

- The game require some kind of input e.g. a button or someone touching the screen after each question before the game continues.

- User and Host can "press" continue and the game will go on to the next question.

Non-functional Confirmation:

- None.

Story identifier: sEliminationMode
Story name: Elimination mode
Status: uncompleted

As a: player I want: to eliminate other players since it makes players play more seriously.

Functional Confirmation:

- In a certain game mode it will be possible to eliminate other players by answering correctly and quickly or being on a streak.

- The player will not be able to choose who to eliminate but should answer correctly and quickly to not get eliminated.

Non-functional Confirmation:

- None.

Story identifier: sAbotage1
Story name: Sabotage
Status: Uncompleted in multiplayer. Partially completed in hotswap

As a: user I want: to Sabotage for other players so that I can catch up if I'm behind in score.

Functional Confirmation:

- The game has different types of "debuffs" that a user can give away before each question.

- The user can choose freely whom he wants to target.

- The debuff only applies for that question.

- Debuffs can stack so if one players is targeted with multiple debuffs the effect should e.g. be double.

Non-functional Confirmation:

- None.

Story identifier: sCategory
Story name: Categories
Status: Completed

As a: user I want: to be able to see the "theme" or category before each question.

Functional Confirmation:

- The users will be able to see the round/questions theme/category during the game.

Non-functional Confirmation:

- None.

Story identifier: sCategory1
Story name: Choose Categories
Status: Completed

As a: user I want: to have the ability to choose the category on some questions.

Functional Confirmation:

- The users will be able to choose between different categories before some questions or rounds during the game.

Non-functional Confirmation:

- None.

Story identifier: sPeopleNotFacts
Story name: People not facts
Status: Uncompleted

As a: user I want to: be able to win without being the one with the most knowledge since i tend to be good with people not facts.

Functional Confirmation:

- In a certain game mode the player will be able to type in a question which could be personal.

- After typing a question the user will be able to choose one correct answer.

- During the time waiting the players will be able to enter a lottery for bonuses and power ups.

- This game mode can make a party more fun since the user who is typing the questions can know which of the players knows the user best.

Non-functional Confirmation:

- None.

Story identifier: sNotOnlyName
Story name: Not only name
Status: Uncompleted

As a: user I want: to be able to distinguish players based on not just the name since some of my friends have the same name.

Functional Confirmation:

- Every player will have a unique icon with the photo of the player.

- Players can also choose a player name which can be what ever name they like.

Non-functional Confirmation:

- None.

Story identifier: sNonTrivia
Story name: Not only trivia
Status: Uncompleted

As a: user I want: to play a game where i can interact with the players in the same room since only knowledge-based questions tend to be to boring for my parties.

Functional Confirmation:

- The game has a mode where you are forced to interact with other users in real life. e.g. a mode where you answer these types of questions "Which player would most likely cheat on a test?" and the most popular answer wins.

Non-functional Confirmation:

- None.

Story identifier: sCustomQuiz
Story name: custom game
Status: Uncompleted

As a: user I want: to create different quizzes since it adds more customization to the game.

Functional Confirmation:

- The user will be able to add their own quizzes to the game.

- The user will be able to host a game with the user's created quizzes

- Users will be able to answer questions created by other users.

Non-functional Confirmation:

- None.

Story identifier: sContPlaying
Story name: Continue playing
Status: Partially Completed

As a: user I want: to be able to continue playing even if one person leaves since it would be unpractical to start a new game if you are near the end.

Functional Confirmation:

- When a user leaves the game the remaining players should be allowed to decide if they will continue as normal or end the game. However it was the host that left the game the game ends.

- The disconnected players stats should still be displayed in the leader-board but appear grayed-out.

- The game should treat the disconnected player as if they don't exist (not include in any calculations) but keep their data on the of-chance that they were to reconnect.

Non-functional Confirmation:

- There should not be any hangups or slow downs after a user disconnects.

Story identifier: sGameModes
Story name: Game modes
Status: Uncompleted

As a: user I want: to Have a variety of questions/modes since it would make the game more fun.

Functional Confirmation:

- The user will be able to choose different game modes when hosting a game.

- Different game modes are played out differently where in some mode answering correctly is the better option while in another answering quickly is better.

Non-functional Confirmation:

- None.

Story identifier: sAddQuestion
Story name: Add question
Status: Uncompleted

As a: user I want: to Be able to write and add my own questions since my own question can be more relevant to the setting.

Functional Confirmation:

- The user will be able to add questions.

- The user will choose the answers for the question where one answer must be right.

- The user will be able to choose the category of the added question.

Non-functional Confirmation:

- None.

Story identifier: sDraw
Story name: Draw
Status: Draw

As a: artist I want: to be able to draw pictures while playing since I'm a good artist.

Functional Confirmation:

- In some cases the answer to a question will be to draw something.

- Points are distributed by popular vote.

- This is a feature when playing in teams where one player in team draws and the other player in the team has to guess what the first player is drawing.

Non-functional Confirmation:

- None.

Story identifier: sRejoinGame
Story name: Rejoin a game
Status: Uncompleted

As a: user I want: to rejoin the game if I or anyone else disconnects since having to wait for a whole new round is boring.

Functional Confirmation:

- If the player gets disconnected from a game the player will still be able to rejoin the game.

- The game which the player was disconnected from should still be running in order for the player to rejoin.

- The player will not lose points upon disconnecting but will not gain points for the missed questions.

Non-functional Confirmation:

- None.

Story identifier: sTeamMode
Story name: Team mode
Status: Uncompleted

As a: user I want: to be able to play in teams since it adds more inter-action and communication with other players.

Functional Confirmation:

- In this game mode players will work together against other teams in order to win.

- Each team will have a certain amount of player where each player in a team can answer for a part of the the whole answer.

- For a team to get points must each player's part of the answer be correct.

Non-functional Confirmation:

- None.

Story identifier: sChooseHost
Story name: Choose game settings
Status: Completed

As a: host I want: to be able to decide on the setup of the game before I host because this will allow me to personalize the game more.

Functional Confirmation:

- a functional req

Non-functional Confirmation:

- None.

2.3 Definition of Done

All user stories and features that are implemented in the application have to fulfill the following requirements to be considered done.

- All code clears all of it's tests. And all classes in model are fully tested.

- All code has relevant comments explaining it's function and purpose.

- All public classes are documented with Java Doc.

- All comments and documentation is written in English.

- All classes and variables share a common naming convention.

2.4   User interface

MainPage has quite a big button that follows the Clear Entry Point design pattern. It makes the navigation easier for the user. Two additional buttons, Settings button navigates to settings page and AboutKahit button that shows a page contains an explanation of the app(1).
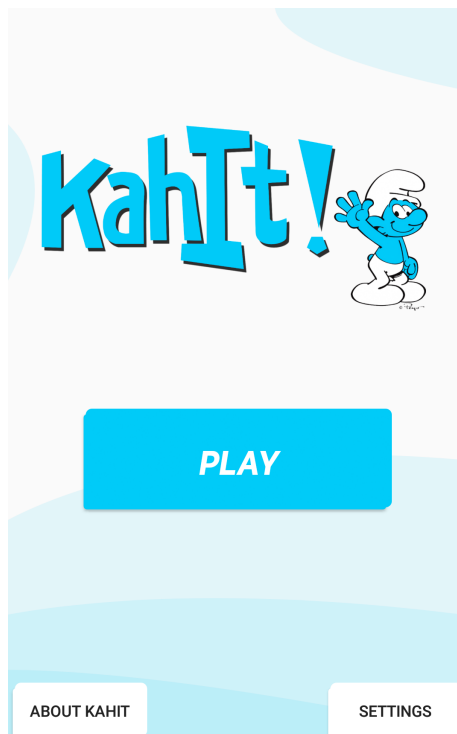

Figure 1: The main page of the application

When the play-button is clicked the app navigates to ChooseGameView. This view contains Three buttons: Host, Join and Hotswap(2).
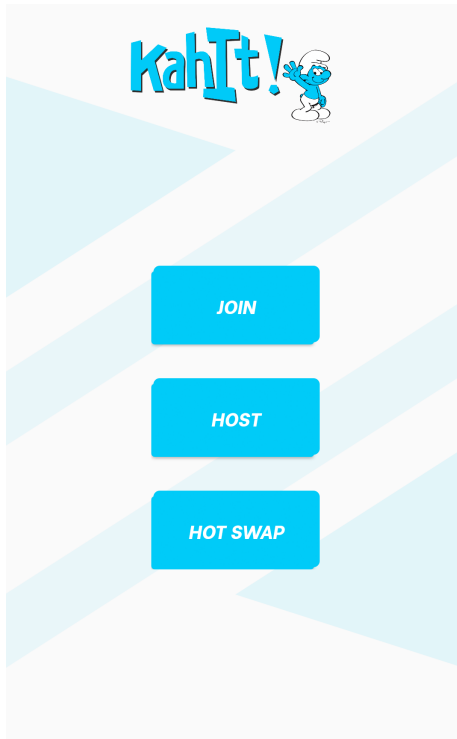
Figure 2: ChooseGameView presents the user with three choices.

- The host button navigates forward to CreateLobbyView where the user can create a lobby as a host and the lobby will be visible to other players nearby. Once all users are ready then the host should be able to start the game. On this page the Good Defaults design pattern is used, where the user already has a default value in every textField that needs to be filled. When the user is ready so they can click on Ready-button and wait for the host to start the game(3).
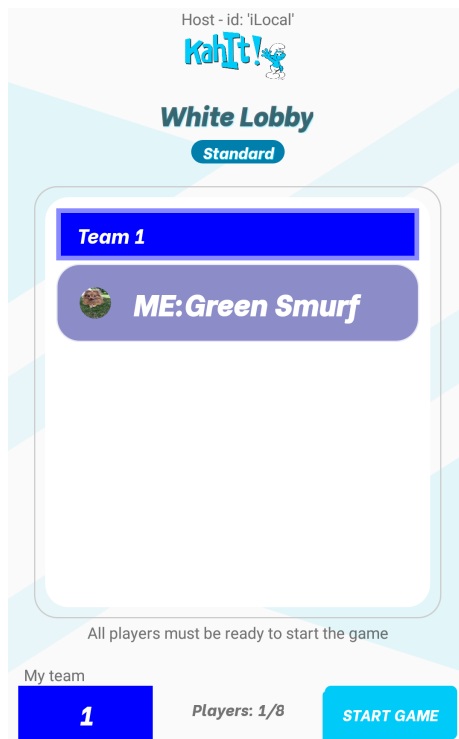
Figure 3: The multiplayer lobby

- Join button navigates to JoinLobbyPage where the user can join a game.
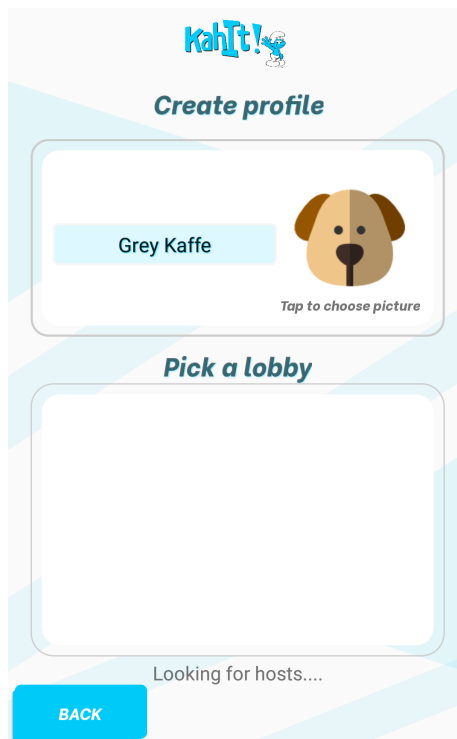
Figure 4: The lobby finder

- Hotswap button navigates to HotswapGameMode-page where the user should be able to choose a gameMode depending on how they want to play. Right now game modes are not implemented due to time restrictions.
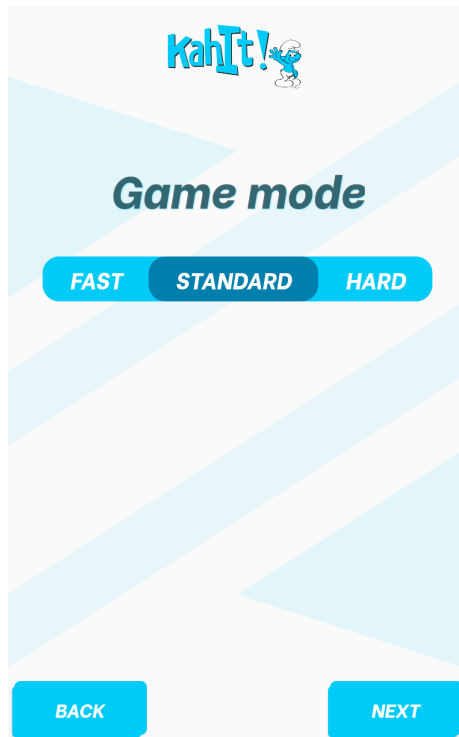
Figure 5: The view for selecting the gamemode for a hotswap game

Next-button takes the user to GameLobby for hotswap mode. In hotSwapLobby, 8 players maximum can be added to the game. Then the game can be started by Go-button.
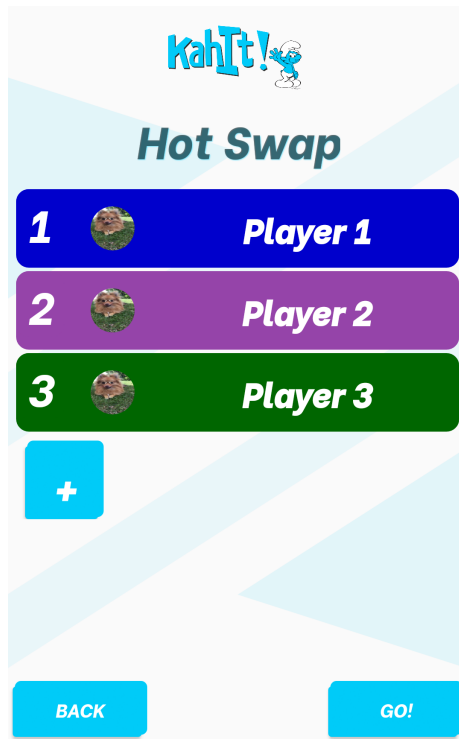
Figure 6: The screen to add players to the hotswap mode

Before starting the game, the user will pass through PreGameCountdown Page that gives them few seconds to get ready.
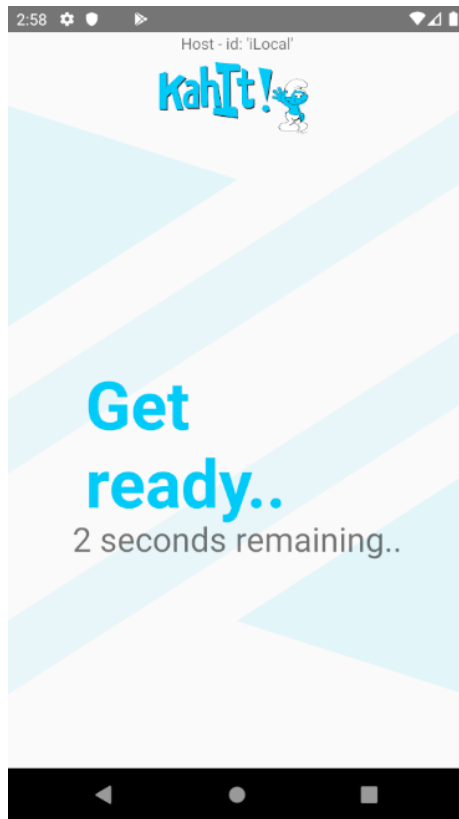
Figure 7: The pre game countdown view.

When the game has been started, there are 2 modes: Hotswap and multi-player. In both cases, the user will pass through the same Question page.
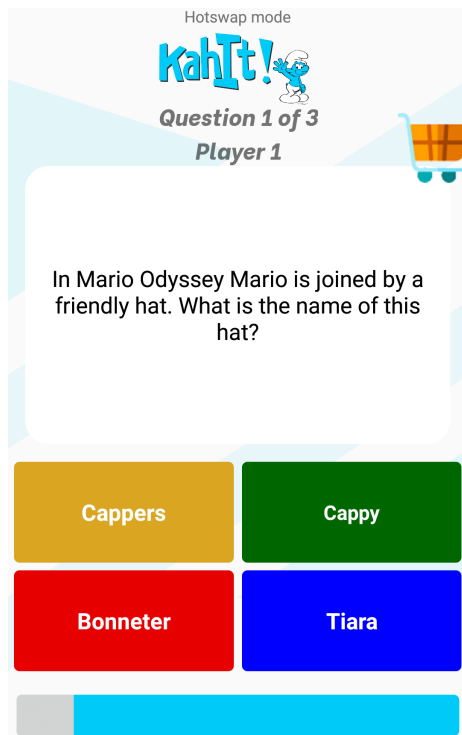
Figure 8: The view for answering questions

During the game, the Store-page is available all time to the users, where they can but items(buffs, debuffs or vanity items) depending on their points that they get when answering questions.
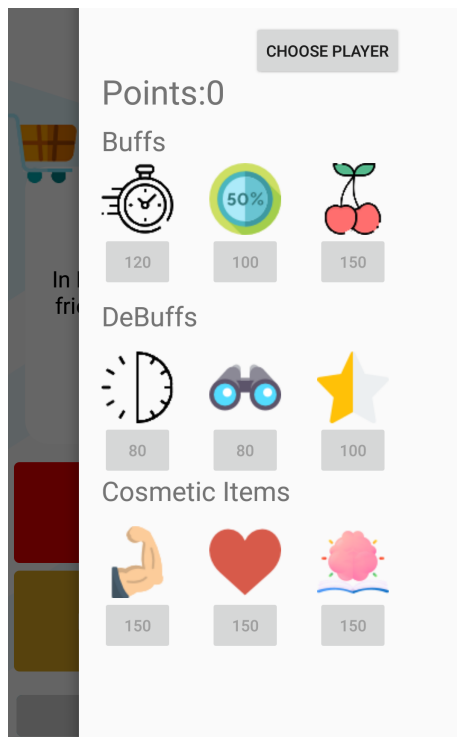
Figure 9: The store

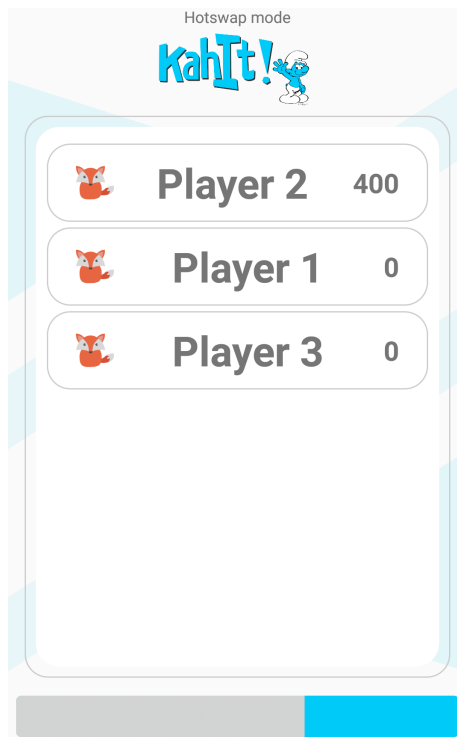After each question, Score-page will be shown up and shows scores for all users

Figure 10: Score-page displaying the score of 3 players in a hotswap match

After each round(2 questions), the user will pass through Lottery-page that will randomize items to all users.
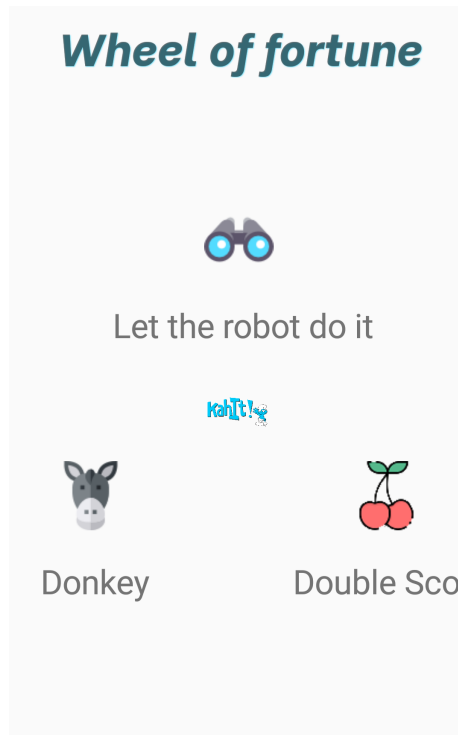
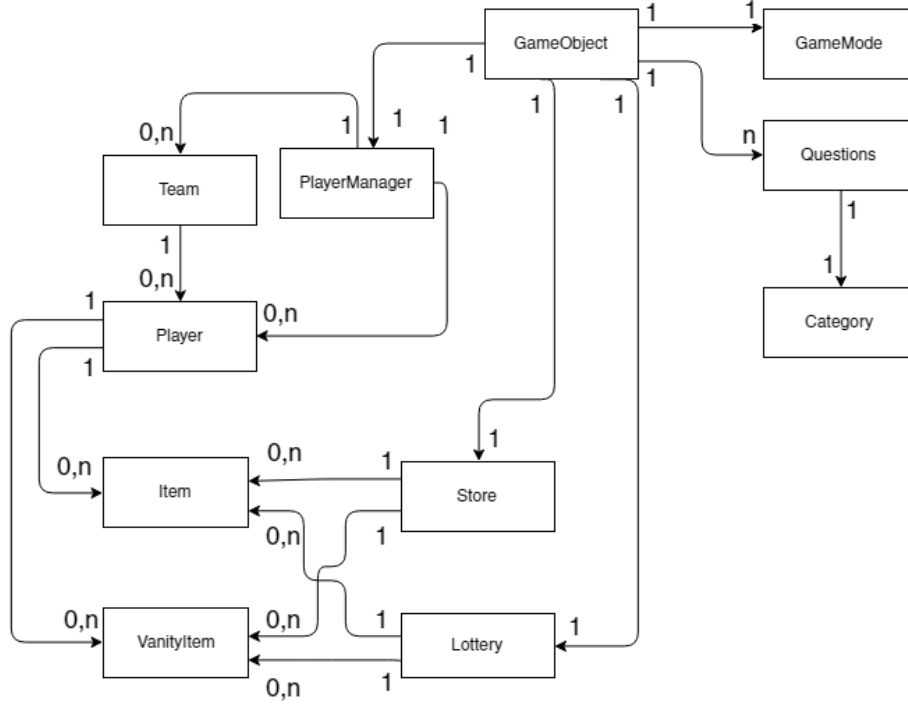Figure 11: The lottery displaying the winnings of 3 players

3 Domain model

Figure 12: Domain Model

3.1 Class responsibilities

3.1.1 QuizGame

The class QuizGame acts as the aggregate object of the model, in other words the QuizGame is the access point through which outer parts of the application communicates with the model.

3.2 PlayerManager

PlayerManager is responsible for handling operations on players and teams and holding them.

3.2.1 Questions

The Question class is responsible for holding all information that is relevant to a question. E.g actual question and possible answers. The class is also responsible for checking if a given answer is correct.

3.2.2 Category

Category is an enumerator that is responsible for representing the different categories that a question can be a part of. The enumerator is also responsible for a number relevant behaviour such as returning a category based on a text string or an index.

3.2.3 Store

The Store class is responsible for holding items and making it possible for players to buy items that can affect their score during gameplay. This class holds values such as which items that are available in the store. This class also holds the necessary logic to complete a transaction.

3.2.4 Lottery

The Lottery class is responsible for managing the lottery prize giveaway system.

3.2.5 Modifier

The modifier class is responsible for the items that can alter the stats of a player. A modifier holds all the values which determines if the stats of a player will be affected positively or negatively. A modifier can affect the stats by the score of a question or the time taken to answer.

3.2.6 VanityItem

The VanityItem class is responsible for the cosmetic items in the game. This class holds values such as the price and the duration of an item as in how many rounds this item can last.

3.2.7 Player

The Player class is responsible for holding all player specific information. Attributes such as current score, player name, id, modifier stats and owned vanity items.

3.2.8 Team

Team class is responsible for keeping track of players in a specific team, team combined score and team name.

Explanation of responsibilities of classes in diagram.

4 References

https://developers.google.com/nearby/connections/overview

List all references to external tools, platforms, libraries, papers, etc.