

Title : HANGMAN

1. INTRODUCTION

Hangman, an android app is a game made to simulate the classical game of Hangman; in which there will be a 'questioner' who will present the player with a word whose letters are blanked out, and the player will then have to guess what the word is correctly. A wrong guess would result in the player's avatar in the game, a stick figure, getting closer and closer to be 'hanged'. Hence, the eponymous name of the game.

2. BACKGROUND

In the pen-and-paper version of Hangman, one player gives the word and other player guesses the words, by suggesting letters or numbers with certain number of guesses. In the Android version of Hangman, the app takes on the role of the 'questioner', with the player. The app assumes that longer words are more difficult, thus, the higher the difficulty, the longer the word given towards the player. The rest of the game just follows the pen-and-paper version in which the word given by one player is to be guessed by the other player.

Unlike the pen-and-paper version however, this Android Hangman has the ability to come up with hints for new words, and but the words 'questioned' are all hard-coded into the app itself. Also, the app has the feature of selecting the category for words to be guessed. For example, player can select the category of countries in order to guess the name of the countries.

3. MOTIVATION

The growth of mobile game development industry is playing an imperative aspect in today's market place. The gaming feature of the smartphone has traditionally been a robust driver of technology. Gaming has attracted the young age group to a great level which has expanded the interest of mobile phone games. To provide the rising demand of mobile phone games, application developers are working very hardly on distinctive platforms.

The majority of the application developer wants to deal with *Android Game Development* and *Android Application Development* as android is the best well-known and simple platform which utilized on various mobile devices. Android is not just a well-settled and broadly conveyed platform, but the capacities of present-day Android gadgets

are starting to surpass the abilities of even those of recent era support frameworks. The differing qualities of clients, makes Android an awesome platform for game development organizations, either its small sized or large sized.

Our aim was to develop a word game called 'Hangman', which will help in increasing the vocabulary and interest in reading and writing. Continuous playing of word games like 'Hangman' will grow our brain's grasping power and helps in increasing the thinking power. Word games helps in increasing the IQ level, knowledge and overall performance of the individual.

4. TARGET USERS

Our target audience will be the people of all age group, specifically, younger age group who loves playing games for their entertainment. More importantly, we can target people who wants to improve their vocabulary and increase their knowledge, like people preparing for entrance exams which requires General knowledge and vocabulary. This game will be a perfect fit for these people.






5. PROBLEM STATEMENT

Hangman, a paper and pencil guessing game for two or more players. One player thinks of a word, phrase or sentence and the other(s) tries to guess it by suggesting letters or numbers, within a certain number of guesses.

The word to guess is represented by a row of dashes, representing each letter of the word. In most variants, proper nouns, such as names, places, and brands, are not allowed. Slang words, sometimes referred to as informal or shortened words, are also not allowed. If the guessing player suggests a letter which occurs in the word, the other player writes it in all its correct positions. If the suggested letter or number does not occur in the word, the other player draws one element of a hanged man stick figure as a tally mark.

The player guessing the word may, at any time, attempt to guess the whole word. If the word is correct, the game is over and the guesser wins. Otherwise, the other player may choose to penalize the guesser by adding an element to the diagram. On the other hand, if the other player makes enough incorrect guesses to allow his opponent to complete the diagram, the game is also over, this time with the guesser losing. However, the guesser can also win by guessing all the letters or numbers that appears in the word, thereby completing the word, before the diagram is completed.

The following example game illustrates a player trying to guess the word *hangman* using a strategy based solely on letter frequency. As the player continues, a part of the stick figure on the noose is added. Once a full body is drawn, the game is over, and the player lost.

- 0  Word: **hangman**
Guess: E
Misses:
- 1  Word: _ _ _ _ _
Guess: T
Misses: e
- 2  Word: _ _ _ _ _
Guess: A
Misses: e, t
- 3  Word: _ **A** _ _ _ **A** _
Guess: O
Misses: e, t
- 4  Word: _ **A** _ _ _ **A** _
Guess: I

Misses: e, o, t



5

Word: _ A _ _ _ A _

Guess: S

Misses: e, i, o, t



6

Word: _ A _ _ _ A _

Guess: N

Misses: e, i, o, s, t



7

Word: _ A N _ _ A N

Guess: R

Misses: e, i, o, s, t



8

Word: _ A N _ _ A N

Guess:

Misses: e, i, o, r, s, t

The guessing player has lost this game as the diagram had been completed before all the letters were guessed

6. OBJECTIVES

- The goal is to develop an app for single players. The game is for two players, the app will automate one player.
- The app generates a word to be guessed by the player and will win/lose based on whether he was able to guess the word.

- The app generates a hint for guessed word and score is deducted on using this hint.
- The app has the options of categories in order to display words based upon similar theme.
- The app has the feature to maintain the highest record of player which helps the player to have their highest score saved.
- Every new game will start without previous context.

7. METHODOLOGY

7.1 Tools and technology used

Tools: Android studio

Android Studio is the official Integrated Development Environment (IDE) for Android app development, based on IntelliJ IDEA. On top of IntelliJ's powerful code editor and developer tools, Android Studio offers features that enhance productivity when building Android apps, such as:

- A flexible Gradle-based build system
- A fast and feature-rich emulator
- A unified environment where you can develop for all Android devices
- Instant Run to push changes to your running app without building a new APK
- Code templates and GitHub integration to help you build common app features and import sample code
- Extensive testing tools and frameworks
- Lint tools to catch performance, usability, version compatibility, and other problems
- C++ and NDK support
- Built-in support for Google Cloud Platform, making it easy to integrate Google Cloud Messaging and App Engine

Technologies:

Android is a software package and linux based operating system for mobile devices such as tablet computers and smartphones. It is developed by Google and later the OHA (Open Handset Alliance). Java language is mainly used to write the android code even though other languages can be used.

a) Java Language

Java is a general-purpose computer-programming language that is concurrent, class-based, object-oriented, and specifically designed to have as few implementation dependencies as possible. It is intended to let application

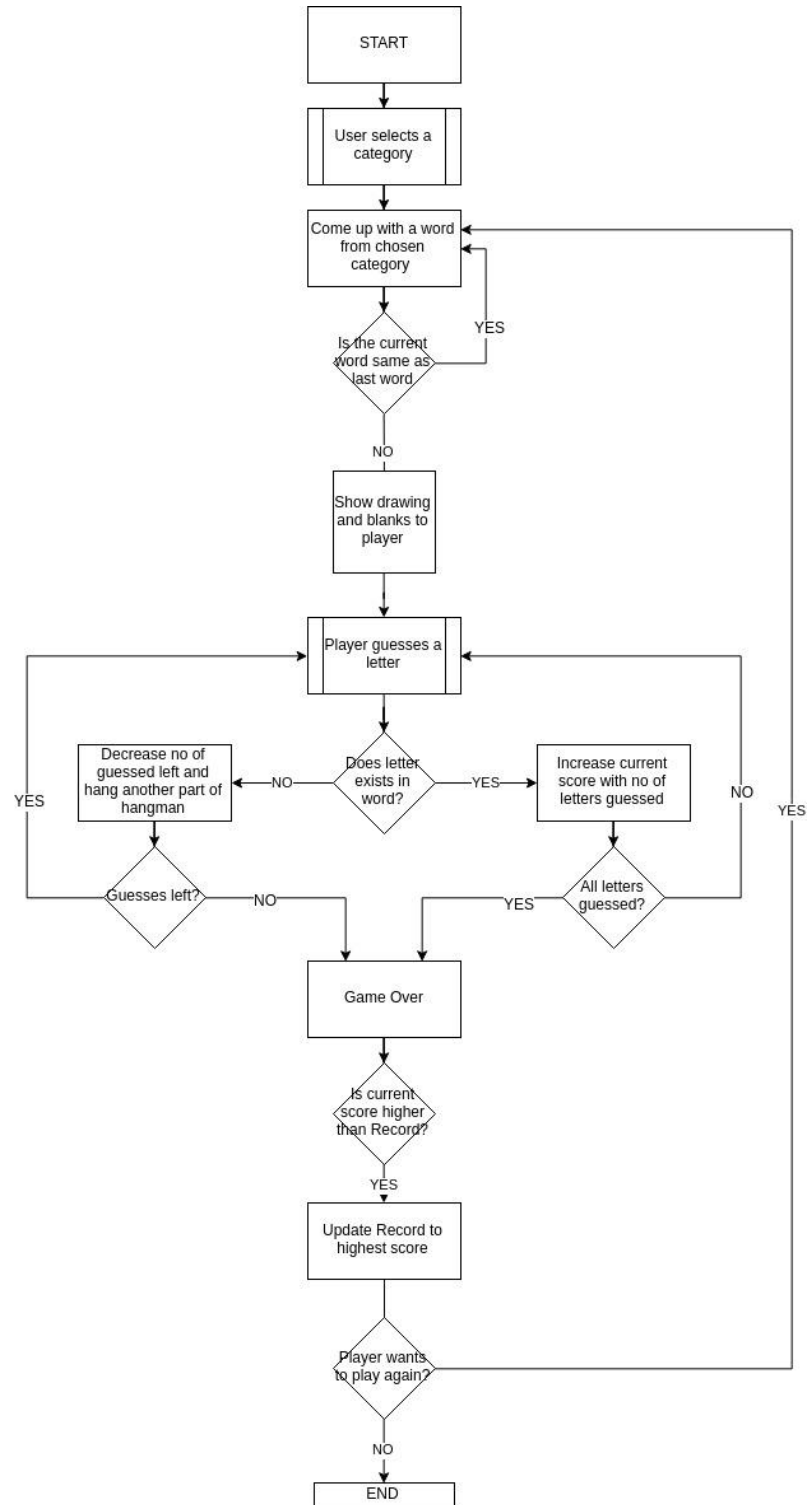
developers "write once, run anywhere" (WORA), meaning that compiled Java code can run on all platforms that support Java without the need for recompilation.

b) XML

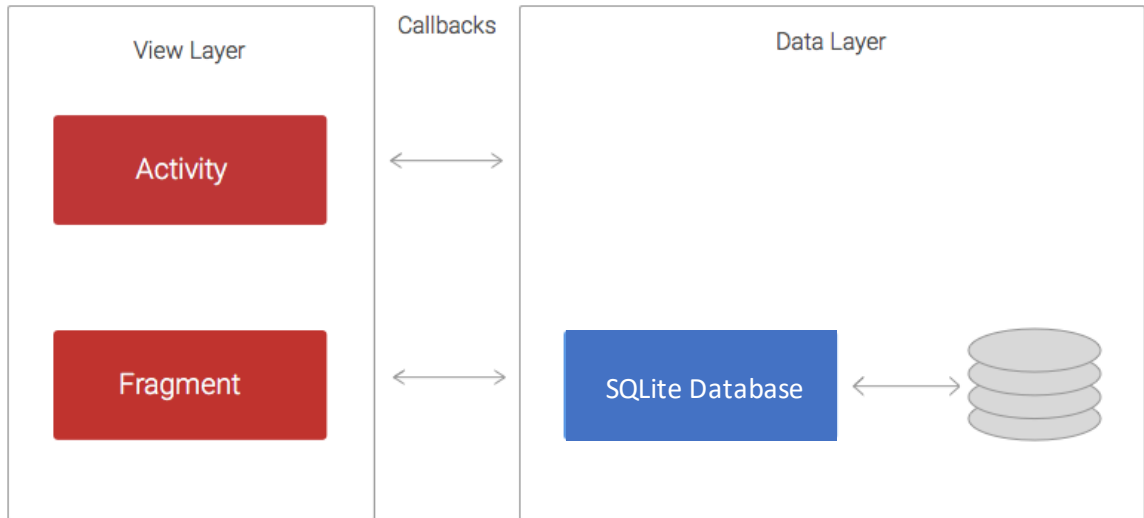
In computing, Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.

The design goals of XML emphasize simplicity, generality, and usability across the Internet. It is a textual data format with strong support via Unicode for different human languages. Although the design of XML focuses on documents, the language is widely used for the representation of arbitrary data structures such as those used in web services.

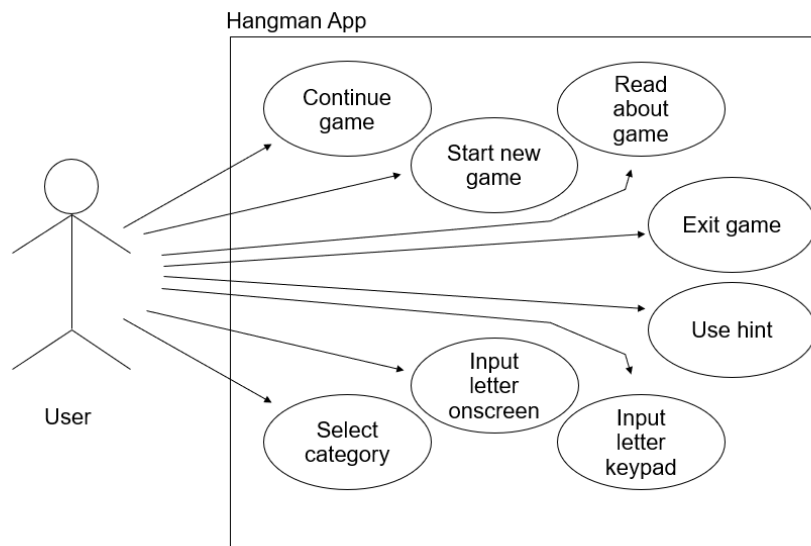
7.2 Flow and architecture



Workflow of Hangman



Architecture



Use Case diagram

7.3 Modules/Components and their features

Main components in Hangman App:

1. Welcome page

This is the first activity that opens up for user. It is the interface for the user to make a choice whether to directly start with the game or to know about the game first and then proceed with the game. It gives user two options:

a. Start game

Choosing this button opens up component 3 of app

b. Help

Choosing this button opens up component 2 of app

2. Help page for game

This is a pop up page that opens up on clicking Help Floating Action Button on Welcome page. The pop up describes the game and helps user understand how it is played. The text shown on page is static.

The pop up covers 70:30 ratio of full screen. The interface is very intuitive. The pop up closes as soon as user clicks anywhere outside the pop up screen or clicking on back of mobile.

If user closes the pop-up, the user is again directed back to Welcome page.

3. Start and select category page

This activity prompts user to select category. The chosen category is used to give user words in coming games.

a. Choose a category

It has two components:

- Button - to prompt user to select category from drop down list and
- Text View - it shows the category chosen by user. It has a default category chosen.

The categories are fetched from SQLite database. The data pumped in text view and drop down list is fetched dynamically from database.

b. Play game

This button prompts user to component 4 of game. The category chosen is passed to next component.

4. Main game page

On starting this activity, category passed from previous activity is fetched. Words of selected category are fetched from database. From these words, a random word is chosen. If the selected word is same as used to previous game, a new word is chosen.

According to the word, no of blanks are inflated on activity.

Score is maintained for game. Points are increased for each correct guess. The score is shown on top of activity page.

Record is maintained for game. It is the highest score achieved so far. It is maintained using shared preferences.

It has an option for showing Hint. If user chooses to get a hint, score is deducted.

The user guesses the letter. If guess is correct, current score is increased by 5*(no of positions where letter is used) and all the positions where letter is used are inflated.

If guess is wrong, one of the body part of hangman is hanged and no of guesses left is decreased.

If all letters are guessed successfully, you win or if all guesses get over, you lose. The current game is over. This opens an alert dialog which shows Win or Lose message with correct word and score. It prompts user to either play again or exit. If you choose to play again, the same game continues, thus score is incremented in same session. If the score is higher than previous record, record is updated.

5. Hint for word

This button is available on Main game page. This opens up a dialog box. This fetches hint from database for current chosen word. When user chooses to get Hint, 5 points are deducted from score.

a) SQLite Database:

SQLite is a opensource SQL database that stores data to a text file on a device.

Android comes in with built in SQLite database implementation. SQLite supports all the relational database features. In order to access this database, you don't need to establish any kind of connections for it like JDBC, ODBC etc.

Database - Package

The main package is `android.database.sqlite` that contains the classes to manage your own databases.

Database - Creation

In order to create a database you just need to call this method `openOrCreateDatabase` with your database name and mode as a parameter. It returns an instance of SQLite database which you have to receive in your own object. Its syntax is given below

```
SQLiteDatabase mydatabase = openOrCreateDatabase("your database  
name", MODE_PRIVATE, null);
```

b) Shared Preferences

Android provides many ways of storing data of an application. One of this way is called Shared Preferences. Shared Preferences allow you to save and retrieve data in the form of key,value pair.

In order to use shared preferences, you have to call a method `getSharedPreferences()` that returns a `SharedPreferences` instance pointing to the file that contains the values of preferences.

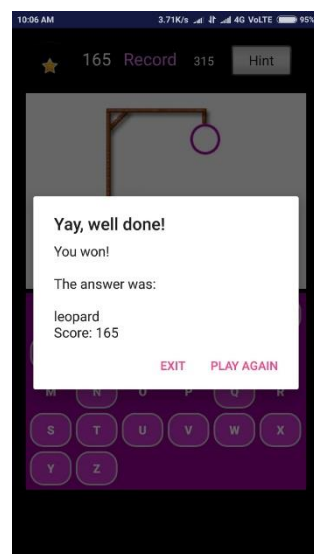
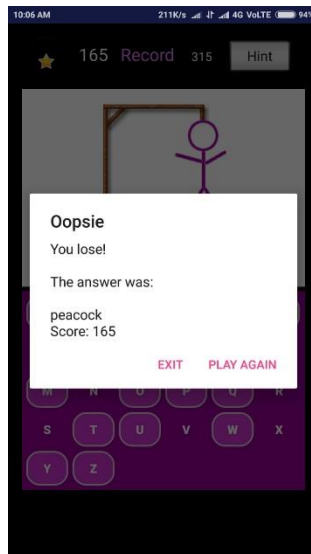
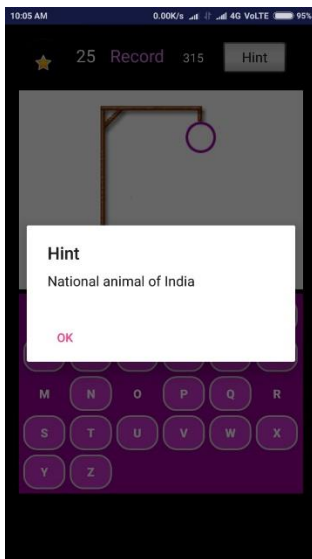
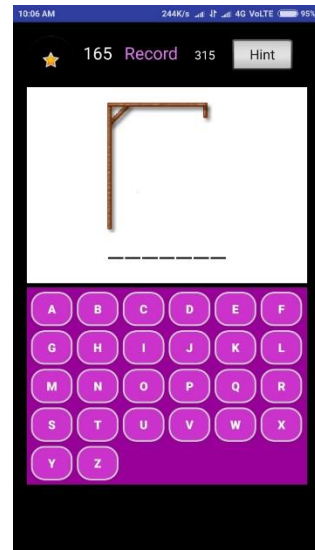
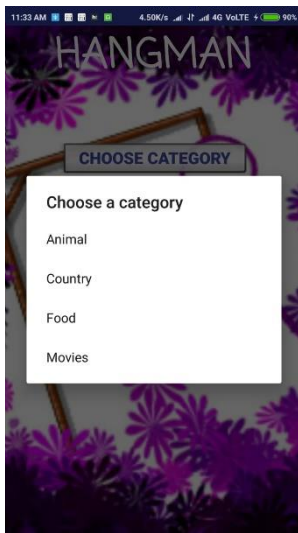
```
SharedPreferences sharedPreferences =  
getSharedPreferences(MyPREFERENCES, Context.MODE_PRIVATE);
```

The first parameter is the key and the second parameter is the MODE.

8. RESULTS AND SNAPSHOTS

Our end result was to develop an android game “hangman” which is a word guess game in which player has to guess a word based upon hints provided. Hangman has been developed successfully and below are some of the screenshots of the game:





9. OBSERVATIONS AND FUTURE WORK

The idea was to polish our skills in android and learn android in quick and efficient way. The most appropriate way to achieve this is by developing an android game. Developing a word game like Hangman have not only enhanced our skills but also given us a deep insight into the android game development world.

We wanted to implement the Hangman game with the ability to generate words on its own; we eventually found out that such an algorithm would probably be quite costly and difficult to implement. However, this being the first Android app we develop, we hope that our subsequent ones would rely less on hard-coded data. While not uniquely significant on its own, this is our first venture into the realm of Android apps, so it was an interesting and educational journey into XML-style documents, as well as a refresher course of sorts in Java.

Our future scope will be:

- To include levels of game based on difficulty of word to be guessed.
- Automate the generation of words or increase the database for the words
- To include multiplayer option in which multiple players can play the game at a time and scoring will be based on errors committed.