COST PREDICTION OF RESIDENTIAL BUILDINGS

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Abstract: The mobile application for estimation of house prices has revolutionized the real estate industry by providing homeowners and potential buyers with a convenient and reliable tool to assess the value of properties. This introduction explores the significance and benefits of such a mobile application. In the dynamic and ever-evolving real estate market, accurate estimation of house prices plays a crucial role for homeowners looking to sell their properties at fair market value and for potential buyers seeking to make informed purchase decisions. Traditionally, house appraisals were conducted by professional appraisers or real estate agents using manual methods and subjective assessments. However, with the advent of mobile applications and advanced technologies, the process of estimating house prices has been transformed. This abstract explores the key features and benefits of such an application. By utilizing android studio, java and centerline method, the app considers various factors including property size, dimensions, amenities, and market trends to generate reliable estimates. This enables homeowners to assess the value of their properties and potential buyers to make informed decisions. The mobile app promotes transparency and fairness in quantity take-off by providing objective information and reducing reliance on subjective opinions. Ultimately, the mobile application on estimation of house prices enhances efficiency, facilitates better decision-making, and contributes to a more efficient and transparent real estate market.

Keywords: Estimation of House, Center Line Method, Android Studio and Java.

I. INTRODUCTION

Estimation of a house is the technique of calculating or computing various quantities and the expected expenditure to be incurred on a particular work or project. And with an increasing number of individuals seeking to buy or sell properties. One crucial aspect of this process is accurately estimating the value of a house. Traditionally, property appraisals have relied on the expertise of professional appraisers, who consider various factors to determine the market value of a home. However, advancements in technology have opened new possibilities, making the estimation process more convenient and accessible to a wider audience.

The advent of mobile applications has revolutionized the way we interact with information and services. These applications, commonly known as apps, are designed to run on smart phones and tablets, providing users with an array of functionalities and services at their fingertips. Recognizing the need for efficient and reliable tools in the real estate market, developers have created mobile applications specifically designed to estimate the value of a house. A mobile application for house estimation offers a user-friendly platform that empowers individuals to obtain a quick and accurate estimate of a property's value. Users can simply input relevant details about a property, such as size, number of floors, number of windows and doors, and recent renovations. The application then processes this information and give the value quantity and rates. By analyzing this wealth of information, the app generates an estimate that reflects the current market value of the house. The convenience and accessibility of mobile applications for house estimation are undeniable. With just a few taps on their smart phones, users can access valuable insights into a property's worth and helping them make informed decisions about the cost of house.

Estimating involves the following operations 1. Preparing detailed Estimate. 2. Calculating the rate of each unit of work. 3. Preparing abstract of estimate.

The Main Objective of this project is to prepare the mobile application using android studio. Writing the code in java using eclipse software. Design of UI (user interface) and the screen elements using Android's XML vocabulary and other

objectives like Prediction of material quantity and corresponding cost. The mobile application project aims to provide a comprehensive, reliable, and user-friendly solution for house price estimation, benefiting both home owners and potential buyers in making informed decisions in the real estate market.

II.   MATERIALS AND METHODS

Manual Calculation: Manual calculation is done by using Centerline method. Centerline method: In this method add the total centerline length of all walls running throughout the building of similar cross-section. In this method the total centerline length is multiplied by width and depth of corresponding item, which gives the total quantity of each item.

It requires special attention and consideration of the junctions meeting together and create T-shape with main walls or cross walls. In this method the centerline length will remains same from EWE to super structure. In case of the junction's actual length of item of work equals to total center line length minus number junctions multiplied by B/2.

i.e., Actual length= (Total centerline length) -(number of junctions*B/2)

AL=T.L-N*(B/2)

Quantity is obtained after calculating in centerline method by using a formula,

For Main wall,
 C.L-N1*B1/2
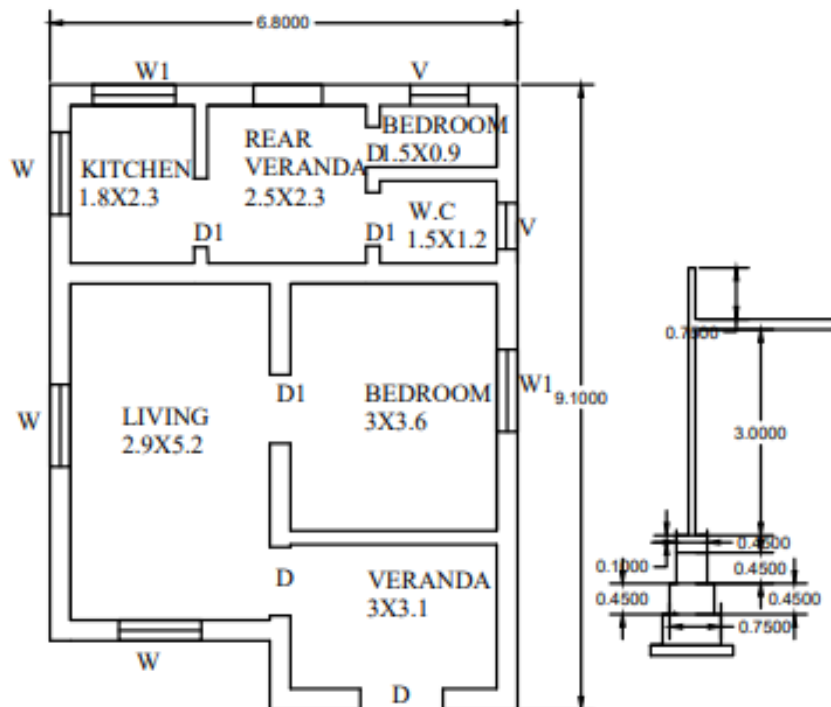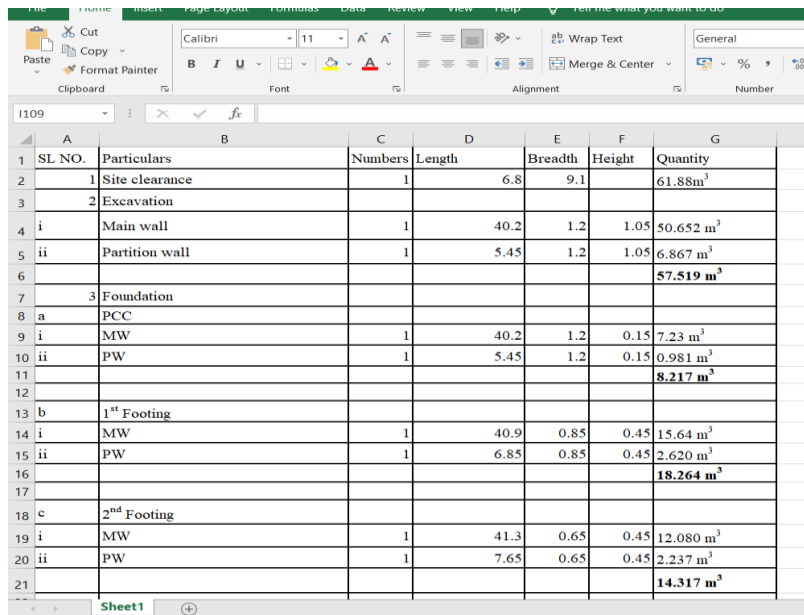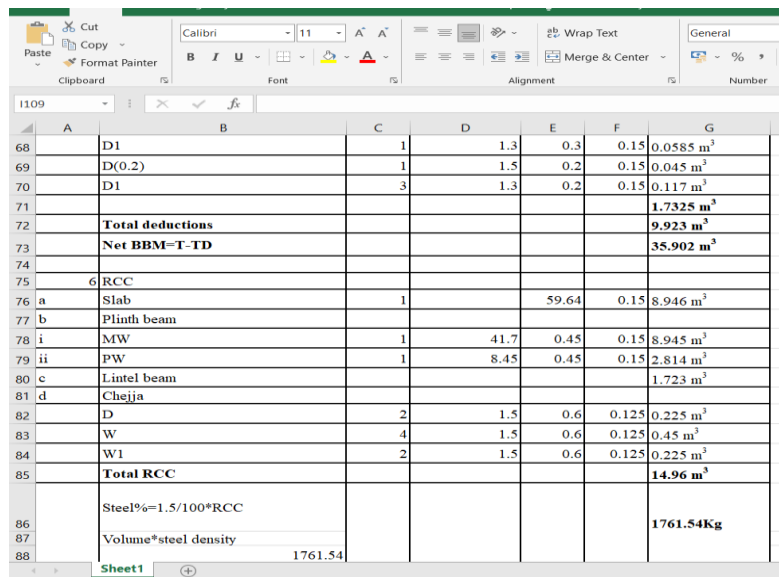 For Partition wall,
C.L- N2*B2/2- N3*B3/2

Fig 1: Plan design and footing details

By Using Excel Spreadsheet Calculating the quantity of house by setting centerline formula in Excel spreadsheet to obtain the results.

Fig: 2 Excel Spreadsheet 1

Fig: 3 Excel Spreadsheet 2

ECLIPSE(Software)**:** Eclipse is an integrated development environment (IDE) used in computer programming. It contains a base workspace and an extensible plug-in system for customizing the environment. It is the second-most-popular IDE for Java development, and, until 2016, was the most popular. Eclipse is written mostly in Java and its primary use is for developing Java applications, but it may also be used to develop applications in other programming languages. Eclipse software development kit (SDK) is free and open-source software, released under the terms of the Eclipse Public License, although it is incompatible with the GNU General Public License. It was one of the first IDEs to run under GNU Class path and it runs without problems under IcedTea.

Android Studio: Android Studio is the official Integrated Development Environment (IDE) for Android app development. Android Studio allows developers to promptly incorporate changes by pushing code and facilitating quick changes without restarting the app altogether. This ensures awesome flexibility for bringing small app changes while the app is still in running condition. The intuitive code editor of Android Studio is a key feature to deliver one of the key advantages of Android Studio, such as faster programming. At the same time, it ensures state-of-the-art refactoring, code completion and code analysis. The Android Studio comes with an Emulator that helps start the entire app faster than the actual device.

The emulator, by allowing you to test the app across multiple devices, including phones, tablets, Android Wear, and Android TV, can simulate several different hardware features like GPS, multiple touch inputs, motion, and acceleration sensors, etc. Android Studio provides a visual drag and drops editor tool for working with XML files. This helps to create an entirely new app layout with ease. The Android Studio layout editor created in sync with Constraint Layout API allows creating layout adjustable to different screen sizes. This ensures maintaining optimized design approaches based upon the device requirements. The advantages of Android Studio can be attributed to several advanced features that help in respect of process automation, managing dependencies and customizing the configuration once and for all. Both local and hosted libraries can be incorporated into the project, and there is immense scope of customization for the app projects.
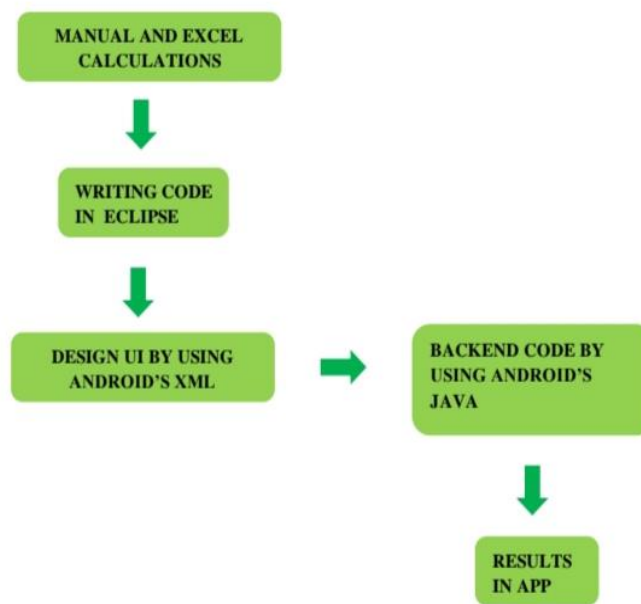
III.   METHODOLOGY

Fig: 4 Methodology flowchart

Description about the methodology

1.   Manual and Excel calculations Manual Calculations or Hand calculations is done by using Centerline method of estimation to get the accurate results of house. Excel calculations is done in excel spreadsheet by setting the Centerline formula to get the accurate results same as hand calculations.

2.   Writing code in eclipse software By using eclipse software writing the java code for estimation of house or quantity take off by adopting the centerline method for reference.

3.   Design UI by using Android's XML UI design of first page, second page and third page by using Android's XML. Android UI design involves the use of prebuilt Android UI components, such as structured layout objects and UI controls, to build the graphical user interface for our applications

4.   Backend code by using Android's Java Android's java is used for the application process and to act as bridge for UI design of the application. Current versions of Android use the latest Java language and its libraries (but not full graphical user interface (GUI) frameworks), not the Apache Harmony Java implementation, that older versions used. Java 8 source code that works in latest version of Android, can be made to work in older versions of Android. 5.Results After the whole process of the development of mobile application the results are obtained in the app by using Centerline method in meters.

IV.   IMPLEMENTATION

System Design: The purpose of the design phase is to plan a solution of the problem specified by the requirements document. This phase is the first step in moving from the problem domain to the solution domain. In other words, starting with what is needed; design takes us toward how to satisfy the needs. The design of a system is perhaps the most critical

factor affecting the quality of the software; it has a major impact on the later phases particularly testing and maintenance. The design activity often results in three separate outputs –

• Architecture design.
• High level design.
• Detailed design.

Design Description
1. Design of first page
2. Design of second page
3. Design of third page

Design Of First Page is done by using Buttons, Relative layout, drawable folder etc., First step is to create a new project in android studio and selecting the empty activity and then giving the project tittle for the application. After creating the application template in android studio, we can see a place to design the application i.e., activity_main.xml and place to write and connect design by using android's java i.e., MainActivity.java. In activity_main.xml the design of UI is done by using either constraintLayout or RelativeLayout.
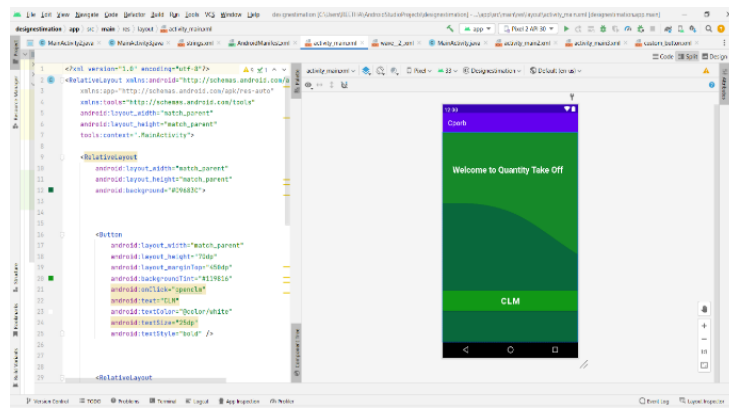

Fig: 5 Opening Page

Design Of Second Page is done by using constraintlayout and submit button to obtain the details of the site dimensions, PCC, 1st footing, 2nd footing, 3rd footing, basement, DPC, plinth beam, outside doors, MW inside doors, PW doors, window, window1, ventilators, no of outside and inside doors, no of windows and windows1, ventilators, thickness of main wall and partition wall, number of junctions in main wall and partition wall and number of floors.
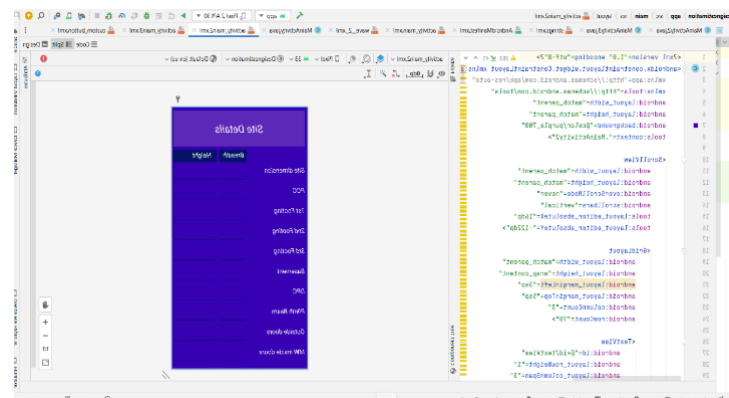

Fig 6: Site Details

The method used to display all the required details are

Relative layout ➡ Scroll view ➡ Grid view➡ Text view ➡ Edit Text➡ Button

Design Of Third Page is done by using Relative layout to display the quantity and their rates, of site clearance, excavation, PCC, footings, DPC, soil filling, brick work, RCC, flooring, wood work, plastering, painting, and centering.
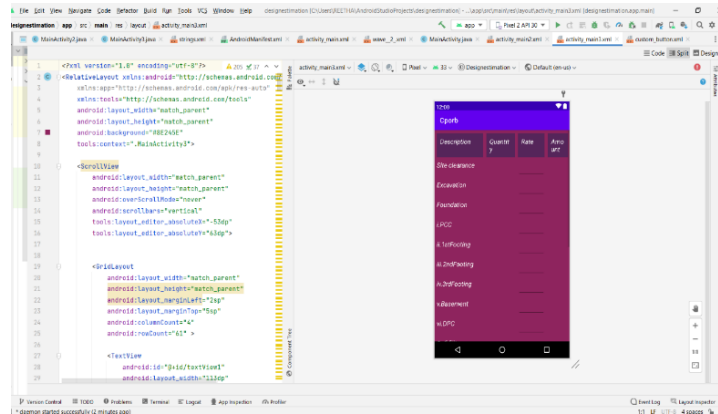

Fig 7: Abstract design-1

The method used to display all the required details are

Relative layout ➡ Scroll view ➡ Grid view ➡ Text view ➡ Edit Text ➡ Button

Description of user interface

Text view: A Text View displays text to the user and optionally allows them to edit it. A Text View is a complete text editor; however, the basic class is configured to not allow editing.

Edit Text: An Edit Text is an overlay over Text View that configures itself to be editable. It is the predefined subclass of Text View that includes rich editing capabilities.

Image view: Image View class is used to display any kind of image resource in the androidapplication either it can be android. graphics. Bitmap or android. graphics. drawable. Drawable(it is a general abstraction for anything that can be drawn in Android). Image View class or android. widget. image View inherits the android. view. View class which is the subclass of Kotlin. Any class application of image View is also in applying tints to an image in order to reuse a drawable resource and create overlays on background images.

Button: Button is a user interface that is used to perform some action when clicked or tapped.It is a very common widget in Android and developers often use it. This article demonstrateshow to create a button in Android Studio.

Scroll view: A view group that allows the view hierarchy placed within it to be scrolled. Scroll view supports vertical scrolling only. For horizontal scrolling, we use Horizontal scroll view.

Grid view: Android Grid View shows items in two-dimensional scrolling grid (rows & columns) and the grid items are not necessarily predetermined but they automatically
inserted to the layout using a ListAdapte.

V.   RESULTS AND DISCUSSIONS

Testing defines the status of the working functionalities of any system. Through testing particular software, one can't identify the defects in it but can analyses the performanceof software and its working behavior. By testing the software, we can find the limitations that become the conditions on which the performance is measured on that level. In orderto start the testing process, the primary thing is requirements of software development cycle. Using this phase, the testing phase will be easier for testers. The capacity of the software can be calculated by executing the code and inspecting the code in different conditions such as testing the software by subjecting it to different sources as input and examining the results withrespect to the inputs.

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or

weakness in a work product. It provides a way to check the functionality of components, subassemblies, assemblies and/or a finished product.
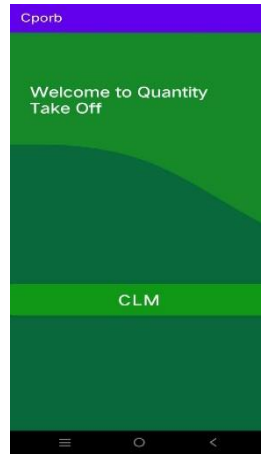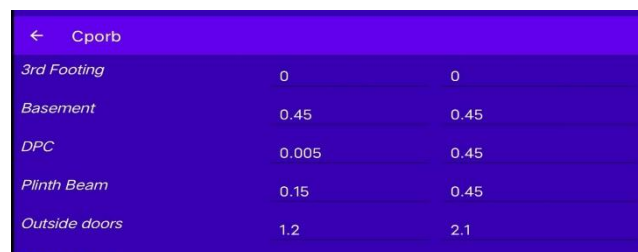
Snapshots

Fig 8: Home screen

Snapshot 1 represents the home screen of android CPORB Application. This screen appears first when we open the application.
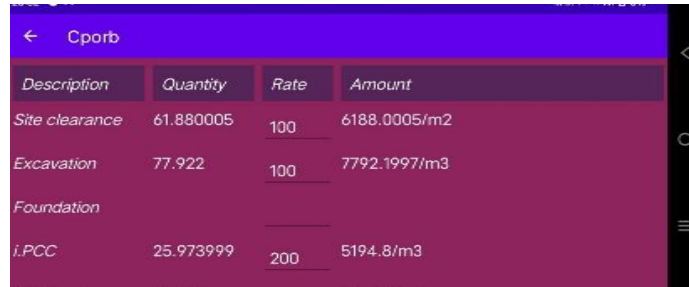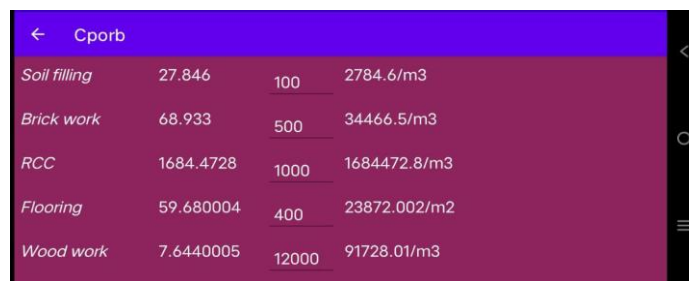

Fig 9: Site details -1

Fig 10:Site details-2

Fig 11:Site details-3

Snapshot site details-1, 2, 3 represents the inputs of the site details to calculate the quantity of house after submit button is clicked. This screen appears after first when we open the application.

Fig 12: Abstract results -1

Fig 13:Abstract results -2

Fig 14:Abstract results -3

Snapshot abstract results -1, 2, 3 represents the results obtained after calculations. This screen appears after second page when we open the application.

Fig 15: App logo

VI. CONCLUSION

The mobile application for estimating house prices offers significant benefits and convenience to both homeowners and potential buyers. By leveraging advanced technologies such as machine learning and data analysis, the app provides accurate and timely estimates based on various factors such as quantity, rates, property size, amenities, and market trends. This empowers users to make informed decisions when buying or selling a house, saving them time and effort in conducting traditional appraisals or relying on subjective opinions. Additionally, the mobile app promotes transparency and fairness in real estate transactions, ensuring that both parties have access to reliable and objective information. Overall, the mobile application on estimation of house prices enhances efficiency, facilitates better decision-making, and contributes to a more efficient and transparent real estate market.

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