PLACEMENT QUESTION BANK: ANDROID INFORMER

Project report submitted in partial fulfillment of the requirement for the degree of Bachelor of Technology
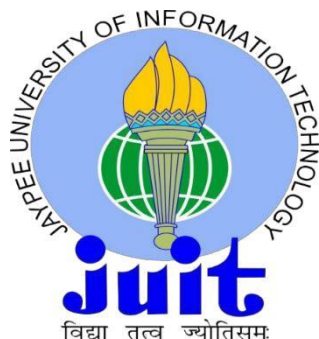
in

Information Technology

By

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Under the supervision of

Miss Ramanpreet Kaur

to

Department of Computer Science & Engineering and Information Technology
Jaypee University of Information Technology Waknaghat, Solan-173234, Himachal Pradesh

Candidate's Declaration

We hereby declare that the work presented in this report entitled **"Placement Question Bank: Android Informer"** in partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology** in **Information Technology** submitted in the department of Computer Science & Engineering and Information Technology, Jaypee University of Information Technology Waknaghat is an authentic record of our own work carried out over a period of August 2015 to May 2016 under the supervision of **Miss Ramanpreet Kaur (Assistant Professor, IT Department)**. The matter embodied in the report has not been submitted for the award of any other degree or diploma.

Osho Tegta, 121404

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This is to certify that the above statement made by the candidate is true to the best of my knowledge.

Miss Ramanpreet Kaur
Assistant Professor
IT Department
Dated:

Acknowledgement

We are using this opportunity to express our gratitude to everyone who supported us throughout the course of this B.Tech. project. We are thankful for their aspiring guidance, invaluably constructive criticism and friendly advice during the project work. We are sincerely grateful to them for sharing their truthful and illuminating views on a number of issues related to the project.

We express our warm thanks to Miss Ramanpreet Kaur for their support and guidance.

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Thank you.

Date:

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Abstract

There are lots of good books available to prepare for placement exams but Android Apps is one way to practice questions anywhere and anytime. You can't carry the hardcopies and placement preparation books everywhere. When travelling in a bus, a metro or car you can just go through different questions to learn methods for solving in quick time. It features certain tests that are based on those used by employers, which you take under time pressure. At the end of the test, the app shows you how you performed, your percentile, and details all the solutions to the questions you got wrong. It's easy to use and intuitive. You can select any section and questions start appearing with complete explanation. This application also has many frequently asked C, C++, Java, Android questions with answers that are gathered from numerous sources including real interviews. Great for both an interviewer to quickly come up with questions. Great for brushing up technical interview questions before an interview. Test Sessions and fully virtual environment of Job Interview will be provided to the user. The test series are divided into four sections: General Section which contains Arithmetic Aptitude Problem Tests, Verbal Reasoning Tests, Verbal Ability Tests, Logical Reasoning Tests. The second set of tests is the Technical Tests that contain questions on C Aptitude Questions, Java Aptitude Questions, C++ Aptitude Questions and Networking Aptitude Questions. It will help you to crack several Machine Code Test Rounds in companies like Cognizant, IBM, HCL, SAP Labs, Infosys, TCS etc. The last section contains the General Knowledge Tests that contains questions on Indian Geography, Indian Economy, Indian Current Affairs etc .

CHAPTER 1: INTRODUCTION

Mobile applications are becoming increasingly prevalent today, particularly in the world of business. With huge potential and free of cost nature android became quite popular, leading to a huge user base. With more than 1.3 billion applications present for android platform and thousands coming out every day android has become favorite of most developers.

1.1 The Android operating system

Android is an operating system based on the Linux kernel. The project responsible for developing the Android system is called the Android Open Source Project (AOSP) and is primarily lead by Google.

The Android Operating System was developed with handheld devices in mind utilizing touch interface. In beginning android was being developed for digital cameras interface but later it was observed that this operating system has much more potential in the smartphone market. With huge potential and free of cost nature android became quite popular, leading to a huge user base.

There are many advantages to developing for the Android platform:

- **Free of cost startup-**The development tools for the platform are free to download, and Google only charges a small fee to distribute applications on the Android Market.

- **Innovation and exploration freedom-**The Android OS is an open-source platform based on the Linux kernel and multiple open-source libraries. In addition to building applications to run on Android devices, developers are free to contribute to or extend the platform as well.

- **Collaboration freedom-** Android developers are not required to sign an NDA and are encouraged to collaborate and share source code with each other. According to a survey

by Black Duck Software, the number of open source mobile apps and libraries grew at a rate of 168% from 2008 to 2009, faster on Android than any other platform. This means more code that you can reuse in your own projects to bring them to market much faster.

- **Open distribution model-** Very few restrictions are placed on the content or functionality allowed in Google's Android Market, and developers are free to distribute their applications through other distribution channels as well.

- **Multi-platform support.** There are a wide variety of hardware devices powered by the Android OS, including many different phones and tablet computers. Development for the platform can occur on Windows, Mac OS or Linux.

- **Multi-carrier support.** A large number of telecom carriers currently offer Android powered phones.

Fig. 1.1 Android Interface

1.2 Android Applications and Market Scenario

Android applications can be easily developed using various free to use Development kits available on the internet coupled with free nature and easy uploading of applications to Google Store makes android development a boon for application developers. In recent years a lot of development in smartphone technologies with dropping of prices of hardware has resulted in tremendous production of android applications varying from as simple as wallpaper changer to complex User Interfaces and enjoyable games. As the user base for android is growing day by day so is the need for new applications, there are thousands of similar applications from which user can choose as per his/her preference.

Being free of cost android development has lead to huge number of developers developing applications for android platform. With support from various smartphone vendors, development for android has reached new heights. Android market share is constantly rising and is at its peak nowadays. With Android securing almost about 85% of the market share (as per the data by Tech Times). Android has been the most number of developer's choice of development platform as it provides the developer with flexibility in development and requires low startup capital.

Major competition to android platform in smartphone market is from IOS, Windows and blackberry, all of them being proprietary platforms giving an edge to android platform over all these other platforms. With new innovations every day and hardware becoming cheap software costs need to come down too which is easier said than done, but being free of cost android is triumphant here.

With uses that can be found in various other devices has even further led to android stronghold in the market, these devices include Digital camera (Eg.Galaxy Camera), GPS navigators, netbooks, smartbooks, smart TVs (Android TV, Google TV). In addition, the Android operating system has seen applications on smart glasses (Google Glass), smartwatches, headphones, car CD and DVD players, portable media players.
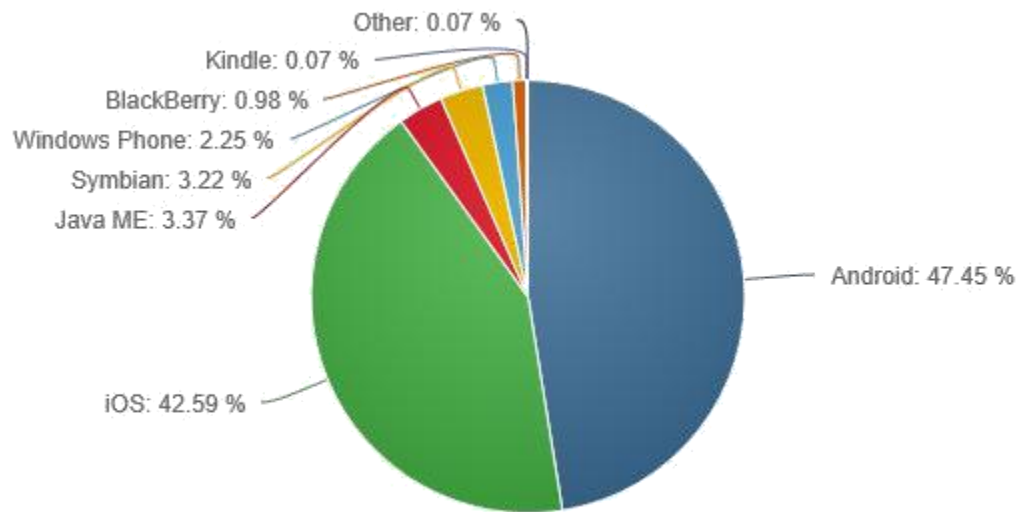
Fig. 1.2 Global Market Share Comparison

Operating System	2014 Unit Volumes	2014 Market Share	2013 Unit Volumes	2013 Market Share	Year-Over-Year Change
Android	1,059.3	81.5%	802.2	78.7%	32.0%
iOS	192.7	14.8%	153.4	15.1%	25.6%
Windows Phone	34.9	2.7%	33.5	3.3%	4.2%
Blackberry	5.8	0.4%	19.2	1.9%	-69.8%
Others	7.7	0.6%	2.3	0.2%	234.8%
Total	1,300.4	100.0%	1,018.7	100.0%	27.7%

Table 1.1 Top Four Smartphone Operating Systems, Unit Shipments, Market Share, and Year-Over-Year Growth, Calendar Year 2014 Data (Units in Millions).

1.3 Problem Statement

The students appearing for placements and various other exams like GRE, GMAT, GATE prepare themselves by appearing for mock tests and searching for the study material from different websites. For this they require an internet connection, which is not possible to access everywhere. Today, the smart phones have replaced desktop PC's and laptops in many manners. There are offline android applications available for these tests but there exists none that provides the test for all sections with random set of questions, timer for each test, tutorials, score calculation and maintaining statistics in one single application. This paper provides a comparison of the existing placement preparation applications available in Android market along with the idea of developing an application that overcomes the flaws of the existing applications. This application has been developed within the framework of the current study that provides its users with a fast, effective and efficient learning environment, thanks to today's various mobile devices.

1.4 Challenges and Issues

- **Software Fragmentation Issue**

  A few variants of Android working framework are accessible on diverse gadgets. Frequent updates change the version of Android OS that keeps running on the gadget. This suggests that the engineers can't simply concentrate on the latest version of the OS as not everybody updates their gadgets. It is inconvenient for many users to upgrade their operating systems.

- **Hardware fragmentation:**

  There are no less than 170 running Android, with generally varying features, from consoles to cameras, in addition to diverse screen shapes and sizes.

- **Stability of the applications:**

  As new applications are turning out regularly, there is no surety that the application will be stable or perform reliably over the wide assortment of gadget present, prompting poor or corrupted performance.

- **Huge number of similar applications:**

  As android development is free and publishing your application is also quiet easy leading to number of similar applications in case of android there can be thousands, which in turn leads to copyright infringements.

1.5 Motivation

- **Huge Market Share**

  Android has a much greater and developing business with an overall about 80% share in the market beating the competition by quite a long stretch.

- **Huge chance of success**

  With the expansion in Google Play market, the odds of created application making it successful are a lot more than its competitors.

- **Free of cost application publication**

  Google Play provides its users over 12% more ad inventory than its competitors which makes it relatively easier and cheaper to advertise your applications.

- **Quicker Turnaround**

  There is no perfect application - meaning that there is always room for improvement. Google Play provides a very helpful platform for beginners and their applications.

- **Huge Free Learning Resources**

  Android community has grown quite big. It has contributed thousands of resources for quickly learning the development on this platform. You can locate rich and innovative media to learn android free of any expense.

- **The Java Advantage**

  Since Android uses Java as its programming language, it has almost all the advantages of Java. Especially in terms of a lot of free and open source java libraries that can be used to develop any kind of app you are thinking of.

1.6 Objective

- To develop applications which provide all the essential functionalities.
- To provide an interface that is easy to use and intuitive.
- To develop an app that helps in satisfying the customer's queries.
- To develop an app that has minimum possible bugs.
- To develop an app that is platform appropriate which means when operating across various platforms, the user experience needs to be modified to take advantage of the native features of different devices.
- To develop an app that has fast loading time and high performance.
- To develop an app that adapts according to the user's requirements for example adding new features, fixing bugs, and streamlining the way it operates with each update.

1.7 Developing Strategy

There are different techniques and approaches for developing an application in general. We would prefer to take on the requirement valued as the most difficult one first. The reason for doing so is to get a clear view of whether it is possible at all to meet user's requirements. If we succeed, then we have a head start and can be certain that the whole project is possible to develop. If we fail, then we can, at an early stage, address the user of the difficulties and not lull the user into a possible false security. If we find different requirements having the same value of difficulty, the one most valuable to the user is chosen.

There are other strategies too, such as a "quick win". A "quick win" is a function having a high value to the user, and one which is easy to develop. In this case one could develop the user interface first, implementing only a part of the application but having the look and feel of the application at hand. This has apparently a high value to the user, is easy to implement, and gives a feeling for the application's end result.

However, this strategy gives false hope to the user and an unwanted pressure on the developer to finish the application. To use this strategy, we suggest only showing the features and functions that are fully developed from the user interface to the server and from the server to the user interface.

Chapter-2   LITERATURE SURVEY

Background theory in this project work serves as prophase for developing an application. That allows us to understand more compatibly the principals and technologies of Android development and can give us idea about further structure of prototype project.

2.1 Basic Overview
2.1.1 Android framework

Android is one of an Open source platforms. It is created by Google and owned by Open Handset Alliance. It is designed with goal "accelerate innovation in mobile" As such android has taken over a field of mobile innovation. It is definitely free and open platform that differs on hardware from software that runs on it. It helps for much more devices to be running the same application. Also it gives possibility of friendlier environment for developers and consumers. Android it is complete software package for a mobile device. Since the beginning android team offers the developing kit (tool and frameworks) for creating mobile applications quick and easy as possible. In some cases you do not specially need an android phone but you are very welcome to have one. It can work right out of the box, but of course users can customize it for their particular needs. For manufactures it is ready and free solution for their devices. Except specific drivers android community provides everything else to create their devices.

2.1.2 Android history

The actual history of Android starts when Google has had purchased and Android inc. in 2005. But the development did not start immediately. The actual progress on android platform starts when 2007 Open Handsets Alliance has announced the Android as Open Source platform and year later the Android SDK 1.0. In the same 2008 the G1 phone was produced by HTC and was retailed within the T-Mobile carrier. In the next two years came

out 4 versions of Android. In 2010 there were at least 60 devices running android and it becomes second after Blackberry the best spread mobile platform.

2.1.3 Development methods used

There are several methods which can support developing process of any project such as:

- Waterfall
- Prototyping
- Incremental development
- Spiral development
- Rapid application development
- Agile software development
- Object oriented
- Top-down programming
- Unified process (CMS 2008)
- System testing

But for our needs, due to limited time of this project, only two are the most suitable: rapid application developing and like part of it prototyping and also system testing.

2.1.4 Rapid application development method

This method is directed by producing high quality system in most efficient time costs. Also it allows in dividing the project into smaller parts and to develop them separately. Its basic idea is to produce high quality system quickly by use of interactive Prototyping. It emphasizes on satisfaction the business requirements. It sets strict deadlines and if project slips the schedule, the emphasis is set to reducing requirements and not on changing deadlines. The prototypes are giving to the user for evaluation.

2.1.5 System testing

System testing in this project will be represented by Specification-based testing. Testing efforts to rich certain level of perfection by detecting all the faults which are in implementation The best way to perform any testing is to select test case that satisfy certain criteria. These criteria are depending on the nature of application and the scope.

2.1.6 Cloud computing and Web services

In the past years, due to the rapid development of mobile frameworks, the need for storing and sharing information throughout different devices has grown. All the process from installing to running most of applications is maintained by using different web sources and services. Insofar as there was need for such product, many companies have established cloud and other mobile services. Companies like Amazon, Google and Parse would offer their web services for modest payment or in some case for free.

Cloud computing is based on the idea that large information sources can provide data to any application which will call for it. The clients of cloud can be smartphones, tablets, and mobile Internet devices. In the case of cloud application design we do not need any more to use storage capabilities of device. Only what is mater are network bandwidth and display capabilities.

We will present one kind of web services on example of the source "Parse". Basically it is the same hosting service, but there are major differences which are making this kind unique and most convenient for developers use.

Parse would offer their version of Parse SDK. This is an empty project that has needed classes to process cloud objects and push them to the web service. On that level of integration it will be very convenient for programmer to use them. That will help to save time cost which would take normal database integration.

2.2 Overview of Research Papers/Journals

2.2.1

Title:	**E-Menu Dissertation**
Author(s) :	Traitet Th.
Date of Conference:	7 Sep 2012

Summary:

In summary, the article evaluates a range of sources in identifying current knowledge and key issues with reference to the focus of the research question 'how can a prototype of an electronic menu (e-menu) application be developed for the casual dining restaurant industry to meet business requirements?' Although several sources have provided useful information related to developing a restaurant e-menu application, such as types of e-menus, restaurant service processes, software development methodologies, and mobile development on iOS and Android devices, the study in the development of an e-menu application for casual dining restaurants is extremely limited. Therefore, research outcomes are able to fulfill a gap in the research domain. Furthermore, the article contains essential information in justifying appropriate approaches for this research.

2.2.2

Title:	**A Mobile Office and Entertainment System Based on Android**
Author(s):	Felix Burkhardt, Martin Eckert, Julia Niemann, Frank Oberle, Thomas Scheerbarth, Stefan Seide und Jianshen ZhouVerma
Date of Publication:	July, 2013
Published in:	DTAG Laboratories
Author Details:	Felix.Burkhardt@telekom.de

Summary and Outlook:

The developed concept and implemented applications enable a safe and enjoyable use of internet and online-services in vehicles. The key challenge, to bring more applications to the car which are usable during drive and understandable without guidance, is a well designed user interface. Within the Connected Live and Drive project such user interface was developed, focusing the goal to keep the handling simple and intuitive, supported by state of the art voice technologies like speech recognition and high quality text to speech added by touch screen interactions.

The concept idea of Mobile Office and Entertainment System based on Android was implemented on different Android based devices like smart phones and a car specific entertainment unit (head unit). During CeBIT 2010, the whole system, running on a head unit in a VW Passat car, was demonstrated at the Deutsche Telekom booth in cooperation with Continental and T-System to a very large audience.

The current system is under further development to integrate additional services and enhance the concept for a wider range of mobile devices.

2.2.3

Title:	**"I am in ASEAN": A Learning Media Application On Android Operating System**
Author(s):	Yupadee Siboopimpa, Thonthan Chaipranitan, Sirapat Chiewchanwattana, Khamron Sunat
Submitted to:	Department of Computer Science, Faculty of Science, Khon Kean University Khon Kaen, Thailand
Published in:	The 2014 Third ICT International Student Project Conference (ICT-ISPC2014)

Conclusion:

When user installed application on tablet, user can learn and enjoy the colorful illustrations, virtual and sound effects which provide enjoyment and skills to learn and remember.

The application was tested with 20 children age of 7-12 years old. The result from the test found that children's favorite are the colorful images which made the interesting and the sound which urges them feel joy and want to repeat. For professors of the classes of children, they have been very satisfied because the application is a creative media and it can be used to educate the children actually.

The implementation aims to provide the knowledge of ASEAN for children and youths to support better understanding of each of the 10 member countries. We applied knowledge combined with technologies into this application. We tested "I am in ASEAN" learning media application with 20 children that the results are satisfactory. The children enjoy with this application and also to enhance the skills to learn and remember because it is a creative media and can be used to educate the children actually.

2.2.4

Title:	**Development and Research of Digital Campus System Based on Android**
Author(s):	Li Ma, Yu Zhou, KuoLiao, Shen Liu, Jie Qiao,Zhenyu Han and Jin Wang
Published in:	International Journal of Smart Home
Journal Details:	Vol.8, No.4 (2014), pp.25-36
	http://dx.doi.org/10.14257/ijsh.2014.8.4.03

Summary:

Digital Campus System is an important platform for students to get all kinds of information .Since the present digital campus system has a defect that users can't achieve the campus information through a mobile phone this paper focuses on some key issues such as how to connect to the target site via the communication interface, crawl pages and sub-pages, parse the desired content and store information in the SQLite database in developing wireless digital campus system based on Android. As a result, this paper provides a practical solution to access School Dean, libraries, etc. compared with the traditional way to access Web pages through the mobile browser the software is more convenient and saves much more data traffic. At the same time, the software not only achieves the docking of Mobile and campus information, and brings a great convenience to the majority of students, but also provides efficient support for the school management.

2.2.5

Title:	**Software Engineering Issues for Mobile Application**
	Development
Author(s):	Anthony I. Wasserman
Submitted to:	Carnegie Mellon Silicon Valley
Author Details:	tonyw@sv.cmu.edu

Summary:

The items discussed are only a subset of the possible research topics in software engineering for mobile applications, but serve to indicate the breadth of research needs and opportunities in this emerging field.

While the large number of mobile applications makes it appear that software development processes for them are well understood, there remain a large number of complex issues where further work is needed. In addition, there is a mobile "angle" to almost every aspect of software engineering research, where the characteristics of mobile applications and their operating environments present a new or different set of research issues.

2.2.6

Title:	**Mobile Application Software Engineering: Challenges and**
	Research Directions
Author(s):	Josh Dehlinger and Jeremy Dixon
Submitted to:	Department of Computer and Information Sciences
	Towson University
Author Details:	jdehlinger@towson.edu, jdixon6@students.towson.edu

Summary:

This paper briefly described four current challenges that we see for mobile application software engineering: designing universal UIs, developing for mobile application product lines, supporting context-aware applications and balancing agility with specifying requirements uncertainty. This paper asserts that mobile application software engineering research efforts need to focus on development approaches emphasizing UI design, proactive reuse at early software engineering phases, attention to context-awareness and sensitivity to specifying requirements to handle requirements uncertainty within the existing agile development approaches used for development applications. In addition, software engineering research needs to emphasize education initiatives in these four areas to ensure that these approaches are disseminated to those doing actual mobile application development.

2.2.7

Title:	**Android Mobile Application Build on Eclipse**
Author(s):	Garima Pandey, Diksha Dani
Submitted to:	International Journal of Scientific and Research Publications
Journal Details:	Volume 4, Issue 2 ISSN 2250-3153
Date:	February 2014

Summary:

This paper is distributed in following sections:
1) Abstract
2) Introduction
3) Eclipse
4) Tools and environment
5) Development of an app

Our objective behind this paper presentation was to discuss all basic details to start android application and to overcome the technical jargons which come as a big constraint on the way of beginner programmer.

Simplicity was the major factor in explaining all installation process of eclipse and a simple android application, which will give a bust to all aspiring android developers.

2.2.8

Title:	**Challenges and Issues in Android App Development- An Overview**
Author(s):	Deepa V. Jose*, Lakshmi Priya C, G. Priyadarshini, MonishaSingh
Journal Name:	International Journal of Advanced Research in Computer Science and Software Engineering
Journal Details:	Volume 4, Issue 2 ISSN 2250-3153
Date:	January 2015

Summary:

Android as a full, open and free mobile device platform, with its powerful function and good user experience rapidly developed into the most popular mobile operating system. This paper gives an overview of the different challenge and issues faced in android app development. It gives a detailed reference of a new app PikDish developed for restaurants. The experience of developing an android app is quite challenging, motivating as well as satisfying.

2.2.9

Title: **Research and Development of Mobile Application for**

Android Platform

Author(s): Li Ma, Lei Gu and Jin Wang

Journal Name: International Journal of Multimedia and Ubiquitous

Engineering

Journal Details: Vol.9, No.4 (2014), pp.187-198

Additional Info: http://dx.doi.org/10.14257/ijmue.2014.9.4.20

Summary:

As the Android operating system is getting more popular, the application based on Android SDK attracts much more attention. But now, some of the Android application interface is too cumbersome, pop-up ads is overmuch and the function is too single, these cause some inconvenience to the users. This article presents the application by eliminating the redundancy. Three kinds of applications are developed base on Java and Android SDK --- Weibo client, video player and audio player. The audio player uses the ContentResolver and Curor to obtain music files and plays the music by using the Service Components to call the Media Player class in the background. The video player uses the Media Player class provided by Android SDK. This class loads the file through URL, realize the multimedia file parsing by calling the OpenCore Library, which is at the bottom of Android, through JNI and by calling the SurfaceFlinger interface to realize the video files' playback. The users' data is collected through the Sina open platform called by Sina client and the data will be returned under the format of JSON by the Sina server. The system uses the OAuth authentication method for user authorization to complete the login process. The specific functions of this system are developed based on Android Weibo SDK. The interfaces of these Android apps are pretty and the operation is smooth. What's more, the cumbersome interface and excessive advertising are eliminated, so that users are able to manipulate these apps more conveniently and smoothly.

2.2.10

Title:	**Android based Training and Placement Automation**
Author(s):	Tejashri Gosavi, Shraddha Gaikwad, Rohit Nazirkar, Amol Salke

(Department of Computer Engineering, JSPM's

ICOER,Wagholi, Pune, India)

Conference Name:	National Conference-Ekalavya-2k15
Journal Name:	Multidisciplinary Journal of Research in Engineering and Technology, Pg.42-47

Summary:

The Developed system can guarantee to keep the records are safe and privacy which is stored in database. In placement system there are many problems to maintain, searching, sorting the entire huge data. The system is provide solutions such as automates the placement procedure for any college.

Using Mahout's Naïve Bayes classification algorithm, it converts and classifies the unstructured data into structured and sorted format. Pattern matching techniques are applied on the data. The Developed system was evaluated, tested, it performs well functional, reliable it very helpful to students to get an alert by the massage on the cell phone.

CHAPTER-3: SYSTEM DEVELOPMENT

By considering the pros and cons of the existing applications, this application has been developed to cover all the features and overcomes the cons of the already existing applications. By keeping in mind the users need and the topics that are important for placements and other engineering entrance exams, this app consists of many sections like Quantitative, Verbal and Logical, Computer Fundamentals, Programming Languages, Brain Teasers. These sections are further categorized into sub sections, each section name describing the type of the test decently.

- **Home**

  It represents the home page that user or admin will see in the starting of the application. This page will have multiple options to go to.

- **List of companies**

  This mode will provide user with quiz divided in categories. During the quiz the user can see the solution too but that question will not count as part of attempted question. Study mode will also have option to refer to notes of that topic.

- **Tips and Tricks**

  Tips and tricks will have formulae and short-trick which will help to solve the questions quickly.

- **Scoreboard**

  The scoreboard will have a score of the user according the level the user stands at.

- **About us**

  A short description of our application will be in this section also including contact details in case of assistance.

- **Upload question**

  Only the administrator will have priority to upload questions .Questions will be uploaded using the excel file.

- **Conduct Test**

  Admin will upload a test only for a limited time for which the users will be notified earlier. Test will have expire time and the test will be removed when expire time occurs.

- **Rank**

  Rank will have decided individually as per category.

- **Graphics**

  This module will provide GUI to users and admin.

- **Server**

  Apache tomcat server will be used to sync between MySQL database and SQLite database using PHP script as a interface between them.

- **Database**

  Database will be online as well as offline

- **Activity**

  Controls all the aspects of the application lifecycle and activity stack.

- **Resource Manager**

  Provides access to the non-code embedded resources such as strings, color settings and user interface layouts.

- **Notifications Manager**

  Allows applications to display alerts and notifications to the user.

- **View System**

  An extensible set of views used to create application user interfaces.

- **Android Handset**

  Any handset that supports android version 4.1(jelly beans) or higher

3.1 Tool and Technology Used

3.1.1 Android Studio:

Android Studio is the official IDE for Android application development. Android Studio provides a number of improvements to assist you in debugging and improving the performance of your code, including an improved virtual device management, inline debugging, and performance analysis tools. Android Studio provides a memory and CPU monitor view so you can more easily monitor your

app's performance and memory usage to track CPU usage, find reallocated objects, locateme mory leaks, and track the amount of memory the connected device is using.

Features of the Android Studio:
- Customize, configure, and extend the build process.
- Create multiple APKs for your app with different features using the same project and modules.
- Reuse code and resources across source sets.

3.1.2 Java Development Kit:

The Java Development Kit (JDK) is an implementation of either one of the Java SE, Java EE or Java ME platforms released by Oracle Corporation in the form of a binary product aimed

at Java developers on Solaris, Linux, Mac OS or Windows. The JDK includes a private JVM and a few other resources to finish the recipe to a Java Application. Since the introduction of the Java platform, it has been by far the most widely used Software Development Kit on 17 November 2006, Sun announced that it would be released under the GNU General Public License (GPL), thus making it free software. This happened in large part on 8 May 2007, when Sun contributed the source code to the OpenJDK.

3.1.3 My SQLite:

SQLite is a relational database management system contained in a C programming library. In contrast to many other database management systems, SQLite is not a client–server database engine. Rather, it is embedded into the end program.

SQLite is ACID-compliant and implements most of the SQL standard, using a dynamically and weakly typed SQL syntax that does not guarantee the domain integrity.

SQLite is a popular choice as embedded database software for local/client storage in application software such as web browsers. It is arguably the most widely deployed database engine, as it is used today by several widespread browsers, operating systems, and embedded systems, among others.

SQLite has bindings to many programming languages.

3.1.4 MySQL:

MySQL is written in C and C++. Its SQL parser is written in YACC, but it uses a home-brewed lexical analyzer. MySQL is offered fewer than two different editions: the open source MySQL Community Server and the proprietary Enterprise Server.

MySQL Enterprise Server is differentiated by a series of proprietary extensions which install as server plugging, but otherwise shares the version numbering system and is built from the same code base.

Major features as available in MySQL 5.6:

- Cross-platform support

- Stored procedures, using a procedural language that closely adheres to SQL/PSM

- Triggers

- Cursors

- Updatable views

- Online DDL when using the InnoDB Storage Engine.

- Information schema

- Performance Schema

- Embedded database library

- Multiple storage engines, allowing one to choose the one that is most effective for each table in the application.

3.1.5 Apache Tomcat:

Apache Tomcat is an open source software implementation of the Java Servlet, Java Server Pages, Java Expression Language and Java Web Socket technologies. The Java Servlet, Java Server Pages, Java Expression Language and Java Web Socket specifications are developed under the Java Community Process. Apache Tomcat powers numerous large-scale, mission-critical web applications across a diverse range of industries and organizations.

3.1.6 Protocol:

A protocol is a standard used to define a method of exchanging data over a computer network such as network, Internet, Intranet, etc. Each protocol has its own method of how data is formatted when sent and what to do with it once received, how that data is compressed or how to check for errors in data.

- **Hypertext Transfer Protocol**

  The Hypertext Transfer Protocol (HTTP) is an application protocol for distributed, collaborative, hypermedia information systems. HTTP is the foundation of data communication for the World Wide Web. HTTP functions as a request-response protocol in the client-server computing model. A web browser, for example, may be the client and an application running on a computer hosting a

web site may be the server. The client submits an HTTP request message to the server. The server, which provides resources such as HTML files and other content, or performs other functions on behalf of the client, returns a response message to the client. The response contains completion status information about the request and may also contain requested content in its message body.

Fig. 3.1 System Architecture of Placement Preparation App
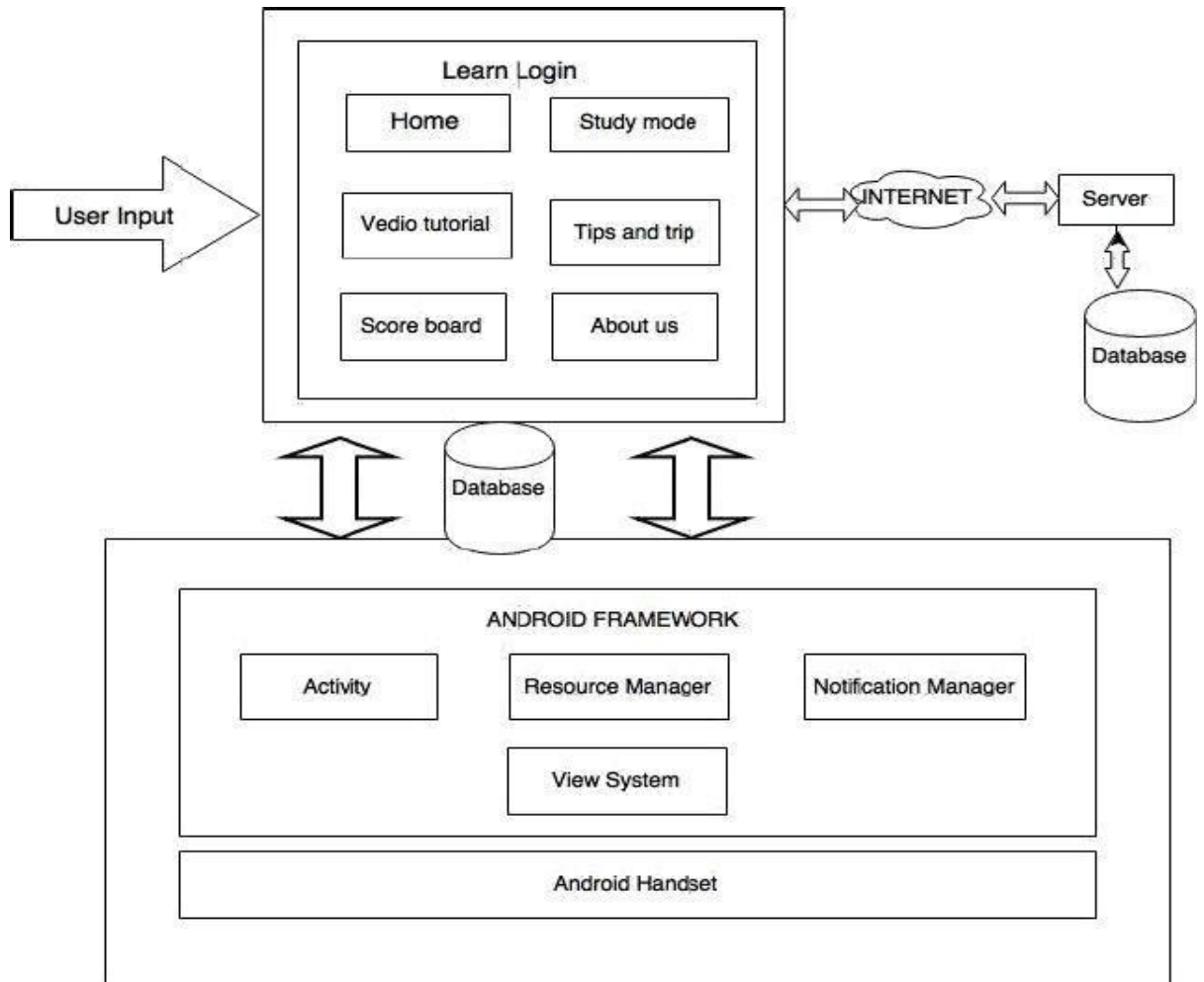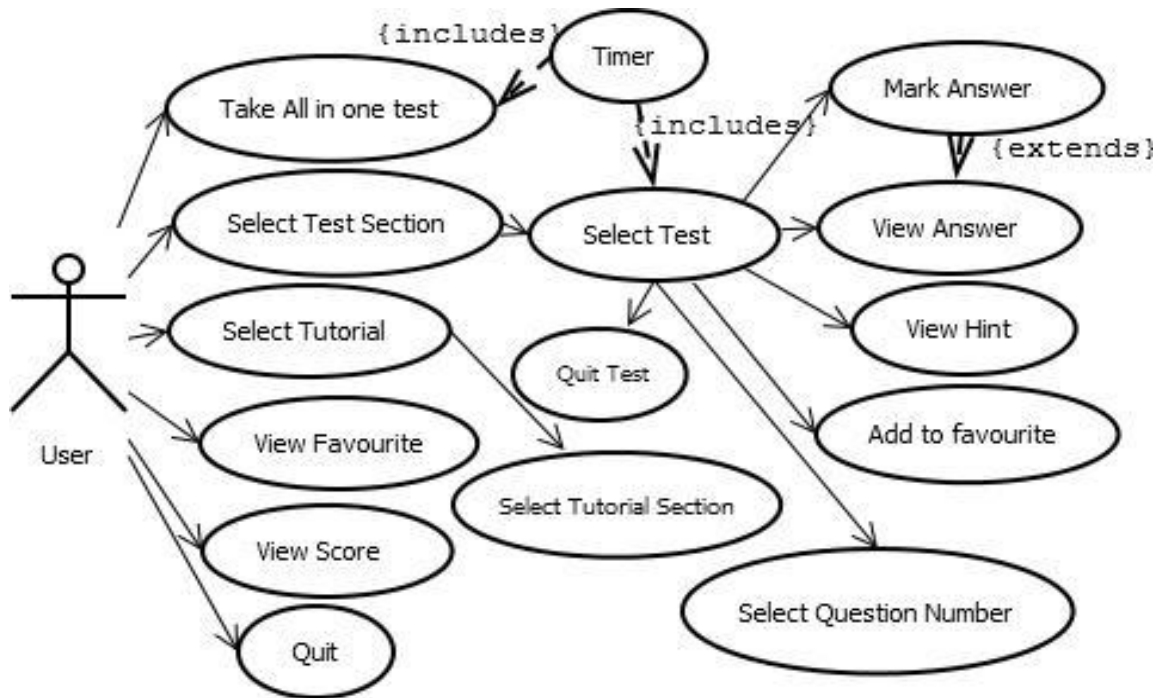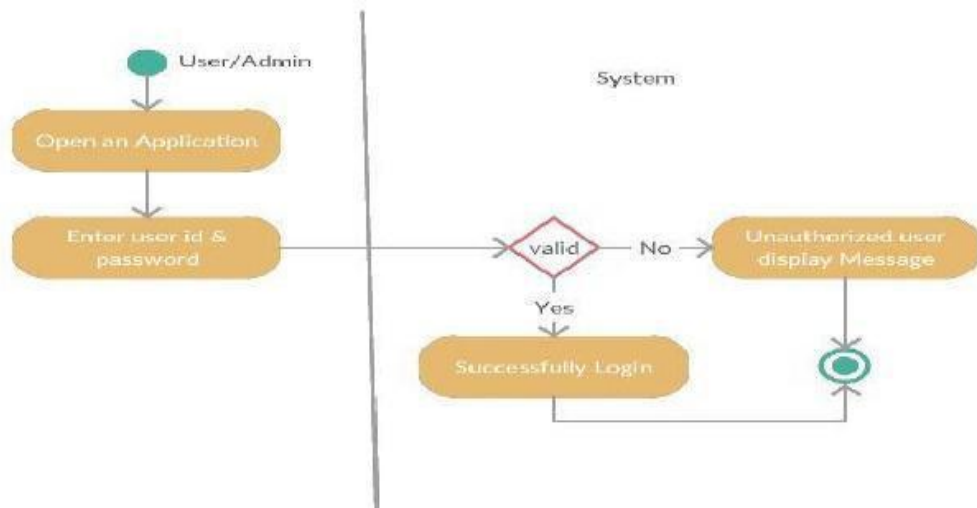
3.2 Diagrams

3.2.1 Use Case Diagram
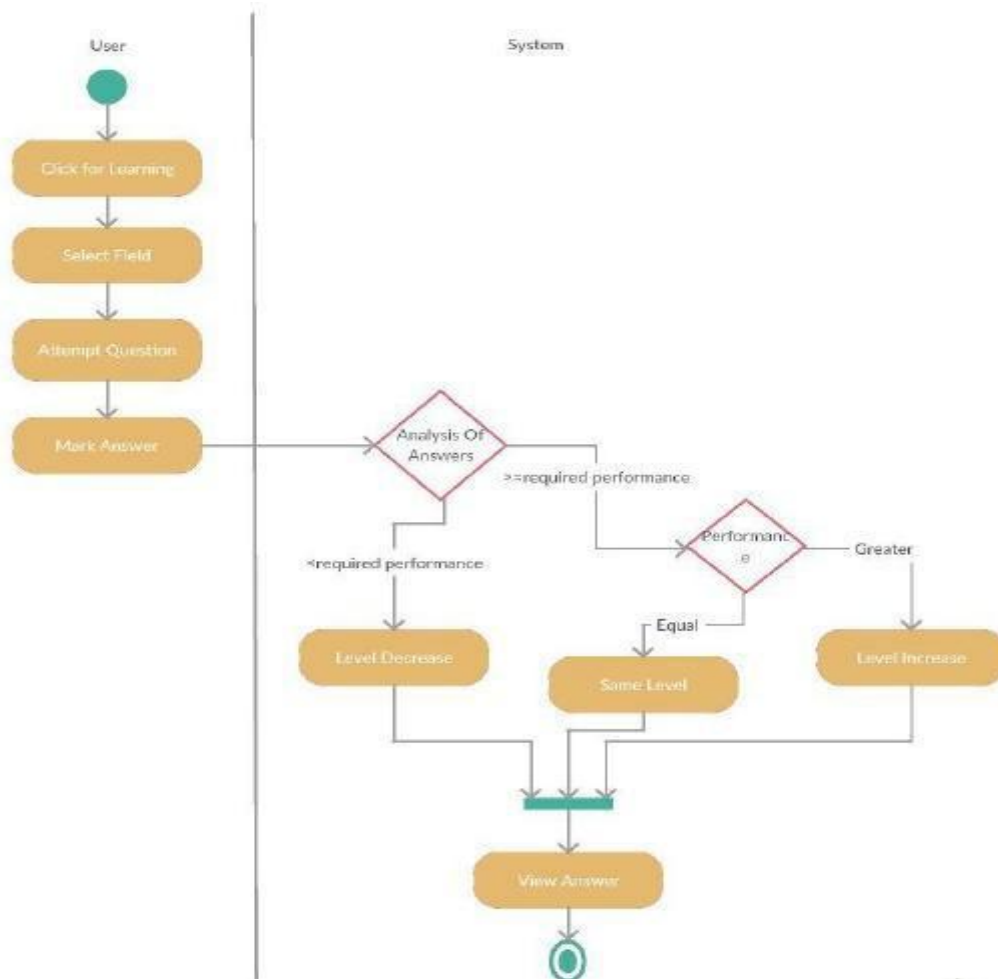

Fig. 3.2 Use Case Diagram

3.2.2 Activity Diagram

- **Login Activity**

Fig.3.3LoginActivity

- **Learning Activity**

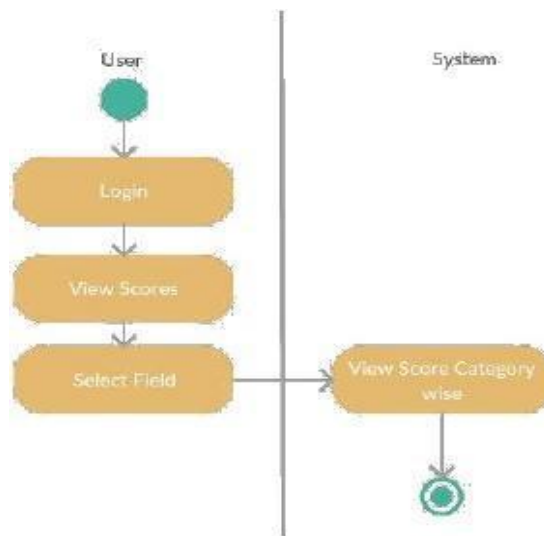Fig. 3.4 Learning Activity

- **View Score**

Fig. 3.5 View Score

3.3 Implementation

3.3.1 Hardware and Software Used

Hardware requirement:

Hardware requirement of the target mobile phone:

- RAM – 512MB.
- Operating System - Android OS, v4.1.2 (Jelly Bean).
- CPU - Dual-core 1.2 GHz Cortex-A5.
- Resolution – 480 X 800 pixels.
- Pixel Density – 217 ppi
- WiFi - 802.11 b/g/n.

Software Tools :

- Android Development Kit.
- Native Development Kit
- Android debug bridge/ Android emulator.

3.3.2 Description of Classes and Functions Used

We have three module in our project in which two of them module are based on Android and one is based on php. Learning and Test application are coded in Android and the third is Admin website is coded in php.

3.3.2.1 Learning Module

In this application there are many methods and classes are commonly used:

- **On create**

  onCreate(Bundle) is where you initialize your activity. Most importantly here we will usually call setContentView(int) with a layout resource defining UI, and using findViewById(int) to retrieve the widgets in that UI that you need to interact with programmatically. In our project we call this method for user interface through activity_main.xml and also weuse onclicklistener() method.

- **OnClickListener Interface**

  Interface OnClickListener is inside the View class. This interface can be used for handling the button so it is implemented into MainActivityclass.

- **setOnClickListener(View.OnClickListener)**

  This method takes the reference to the Listener and registers a callback to be invoked when the View is clicked. So listener is present in the same class MainActivity for passing the reference using this.

- **setContentView(R.layout.activity_main)**

  This method takes a layout and it set the view as the layout to the activity. We created a layout named activity_main.xml. As all the ids for all the components are generated automatically and stored inside R.java file so we are selecting the id of our layout from R.java file (R.layout.activity_main).It gets the resource object that represents the layout as defined by the XML file created by the designer and makes it the current ContentView i.e. it is what is displayed on the screen. That is it makes the connection between the layout you have defined using the designer and stored in the XML file and the user interface that appears on the devices screen.

- **AsynTask:**

  AsyncTask enables proper and easy use of the UI thread. This class allows performing background operations and publishing results on the UI thread without having to manipulate threads and/or handlers. An asynchronous task is defined by a computation that runs on a background thread and whose result is published on the UI thread. An asynchronous task is defined by 3generic types, called Params, Progress and Result, and 4 steps called onPreExecute, doInBackground, onProgressUpdate and onPostExecute.

- **MainActivity.java**

  The entire control and workflow is described in this class. It has mainly two methods oncreate() and setContentView(). In our project we call onclicklistener() four times for different purposes:-

  Help.class

  Signup.class

  Exit

  Login: If user successfully login then the session will started after that long operation class will executed.

- **Longoperation class**

  Longoperation class of mainactivity.java file is used to send the data to server and to receive or get the response from the server. It will send email and password to server "fp.php" and "fp.php" check the value in database and send reply to mainactivity.java. If the user is valid user then sends to next activity (question.java). For the background processing we use AsynTask class.

- **Help.java**

  It gives information about the learning application.

- **Signup.java**

  User can fill all the details then this file is used for check all the criteria is correct or not, If it is correct then it will jump to Longoperation class.Longoperation class of help.java file is used to send the data to server and to receive or get the response from the server. It will send email and password to server "nu.php"and "nu.php" get value from client and store it into database.

- **Question.java**

  We call oncreate() method for user interface through question.xml and onclicklistner() four times.

  1. Logical

2. Aptitude

3. Verbal

4. Result

If we click on logical, aptitude, or verbal we have list of category respectively and choose any of them the username, category, level(0) is send to test.java file.

- **Testpage.java**

We call Oncreate() method for user interface through tp.xmlFirst class- This class of Testpage.java file is used to send the data to server and to receive or get the response from the server. It will send email, category, level(-1) to server "qlvid.php" and "qlvid.php" reply user actual level and all level qid of the user. Level shows the current status of the user and qid gives the position of question number for that level of the corresponding category.

- **Long operation():**

This method is call for every question to fetch each question. This class of Testpage.java file is used to send the data to server and to receive or get the response from the server. It will send category, qid(question id), level to server "que.php" and "que.php" reply question of same category and next of that qid. Our timer which is set to 20 minutes is start after every five question complete, and user level is change according to the analysis of time and correct answer of attempted 5questions and finds the accuracy and performance of the user. If question is over or any error in given question then popup message is generated "No more question in database". No more questions found:- If there is no more questions found in database or if the user is already attend that question of a particular category after that if the same user again click on that category and more questions are not available for that category . Then it shows the popup message "No more question" because question are not repeated for the same user.

3.4 Overview of the phases of development

Work carried out in Phase I

As our project work was divided into two phases, first phase was the requirement gathering analysis and design of the project and second phase is the implementation of the project. In phase 1, we first gathered what are the requirements of our project. We searched about the existing systems that are already present and the systems that are performing nearly equal tasks that our intended system is supposed to perform. Then we discussed about the protocols available to implement our proposed system. After that we listed the detailed Functional and Non-functional requirements.

Then we did the feasibility study of our system whether thetechnologies are available or not that can be used to implement it. Is this project is possible technically. After the feasibility it was then confirmed that the project is achievable in the specified time restrictions. Then we listed the hardware support required to run the system and software support to build this system. Then we discussed about the software development lifecycle models, which model should be used, and decided to choose Iterative model. Then we made the use case diagram to get the basic functionalities of the system. After use case diagram, and use-case description we made architecture diagram of the system and following it, the activity diagram, flowcharts, and ER-diagram are made.

Work to be carried out in Phase II

First phase aims to cover the three most important stages in software development life cycle i.e. Requirement gathering, Analysis and Design. But the design part remains incomplete thus it will be the first priority of the project to complete the diagrams of the design part. Design part is very important stage in the SDLC model as properly designing all the aspects of the projects will help in further implementing code and testing them. Even after that, in assembling all the components and deploying all of them at their proper place would only result in the correct output of the project. As project is planned to follow object oriented

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approach and is performing the software development in iterative as well as in modular manner, the project is in the design stage. The next task to be performed would be the study of behavioral interaction between the identified classes of the project. On the basis of that study, interaction diagram would be made and that would be either sequence or collaboration diagram. Sequence diagram should be made as it represents the interaction on the scale of timestamps and managing the order of object interaction would be very crucial. The next thing to be done would to create a state chart diagram for every object in the project and showing process flow on the occurrence of different events. Modules can be created in respect of the similar functionalities provided by the different classes and they can be divided among team members so that parallel implementation of code can be performed. Similarly designs for test cases should also be created in advance for performing testing in the future. After that, implementation of design can be started in the already chosen programming language JAVA and Android. After the successful completion of different modules, test cases should also be implemented using JUnit in JAVA and should be applied on the classes. This would cover the unit testing for the project. After that, integration testing should be applied after integrating respective modules and finally the whole assembling of modules will be performed. After that Component diagram should also be made in order to show all the executable components of the project and Deployment diagram for showing the actual hardware implementation in the project. Testing the project properly and assuring that it works properly for all the clients would finish the second phase of the project.

The items discussed in the report are only a subset of the possible research topics in software engineering for mobile applications, but serve to indicate the breadth of research needs and opportunities in this emerging field. While the large number of mobile applications makes it appear that software development processes for them are well understood, there remain a large number of complex issues where further work is needed. In addition, there is a mobile "angle" to almost every aspect of software engineering research, where the characteristics of mobile applications and their operating environments present a new or different set of research issues.

3.5 Experimental Results

In this portion of the report we will be giving you an idea of how our app looks like. We will enlist the various pages and activities in our app and sequentially how the pages together combine to form our app. It will include snapshots of pages like Login page, Sign up page, list of various companies enlisted in the app, scoreboard, query page or the online forum page for discussion of ideas and similarly the remaining types of functionalities covered in our application. The performance analysis will be covered in the coming chapters where these features and functionalities will be discussed upon and methods will be suggested to decrease the performance issues we generally face in the development of similar type of applications.

It is actually quite premature to say that we can completely evaluate and analyze the true experimental results for this application because this is a very elaborate process where we have to first publish the application in the app store and then we have to perform beta level testing and then evaluate the results from the poll and opinion of people on the app. Hence after this we can decide what features and functionalities to add according the response by users and then further evaluate it.

3.5.1 Snapshots of the application

1. Home Screen/Sign in Page:
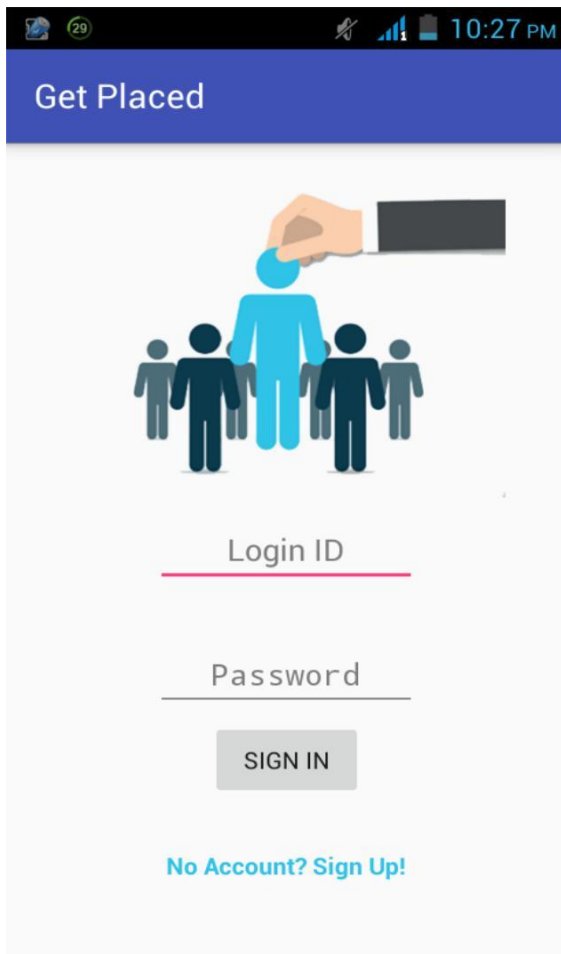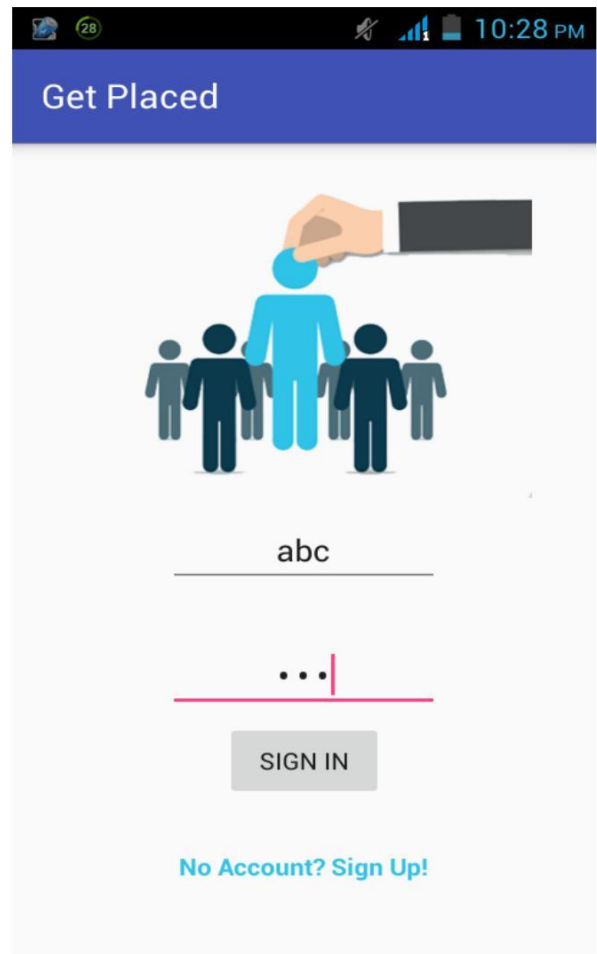
Snapshot 1   Snapshot 2
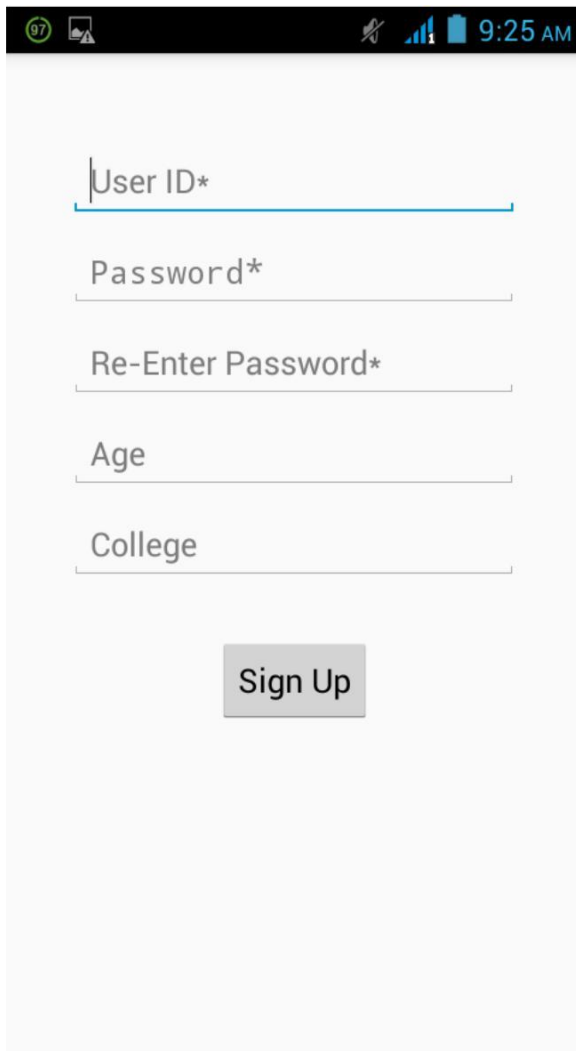
Description:

Here as you can see is the Home page or the Sign in page where in the application you can sign in with your previously created credentials and account details and hence you can successfully enter using your id and password.
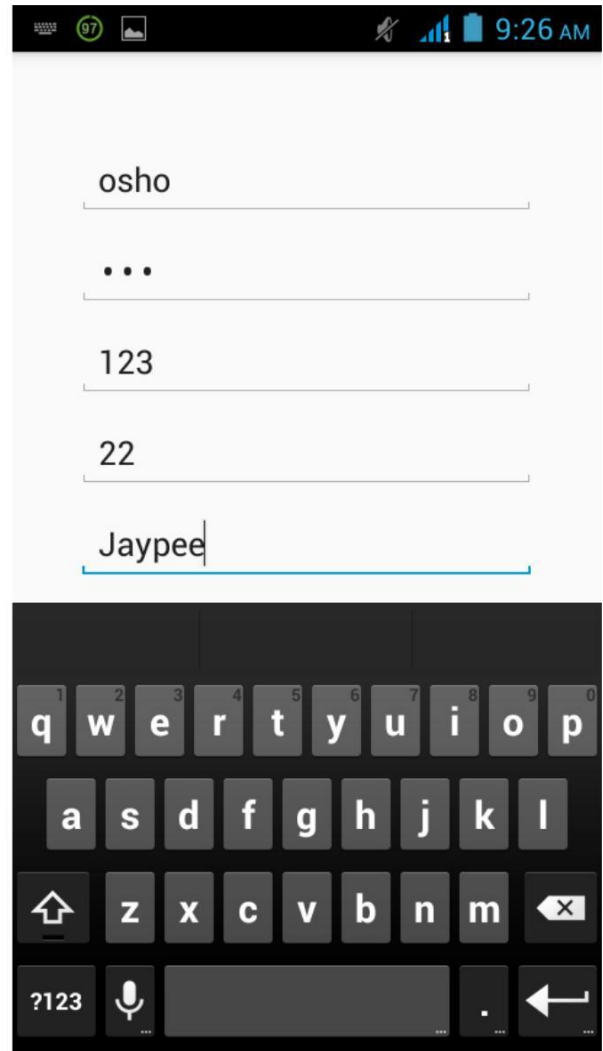
2. **Sign Up Page:**

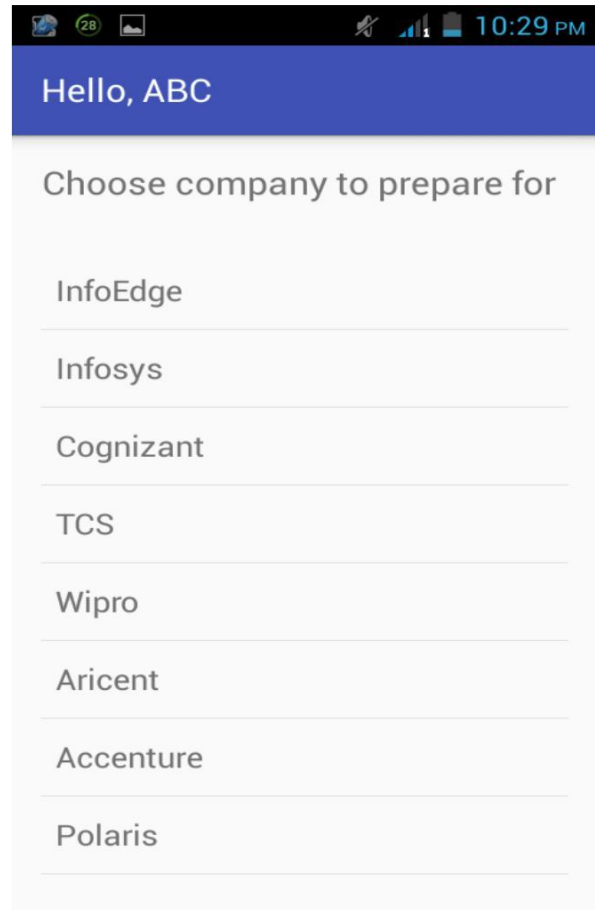Snapshot 3   Snapshot 4

Description:

The following figure shows us the Sign up page where we have to fill in the various fields like username, password, age, college details. This information will form the profile of a particular user in the database.

3. List of companies to prepare for:
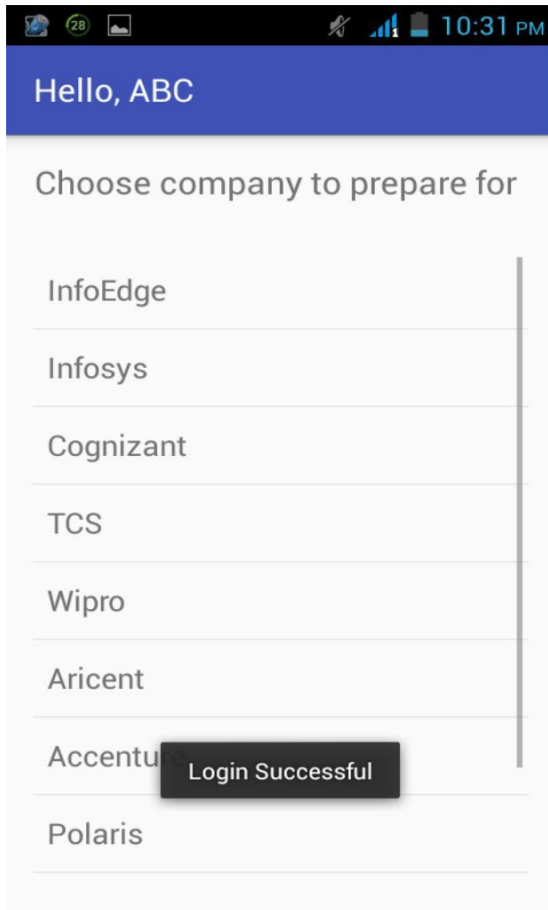
Snapshot 5   Snapshot 6
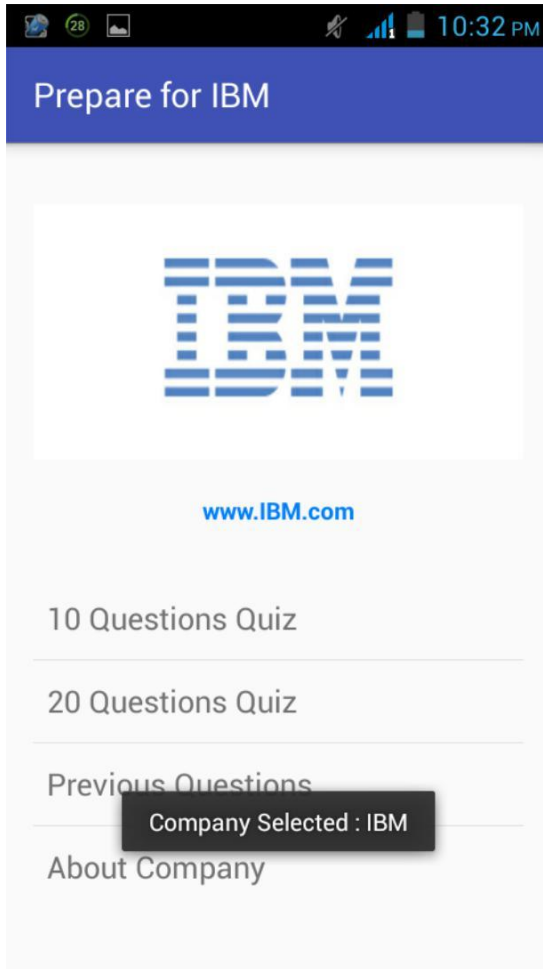
Description:

Here you will find the list of various companies enlisted for the preparation process. You can choose any company that you wish to prepare for and then click on it and you will find the company related questions there.

4. Choosing your company:

Snapshot 7   Snapshot 8
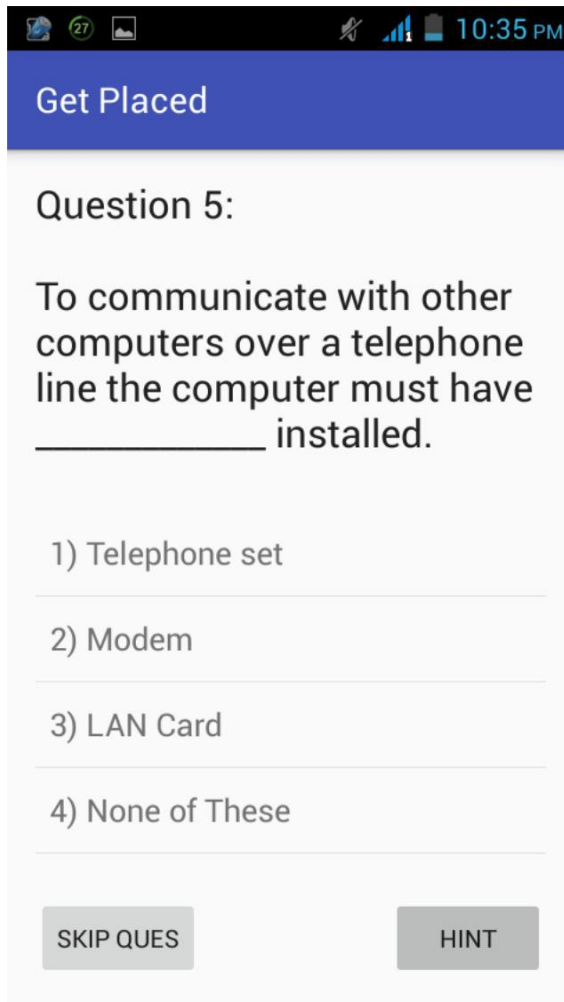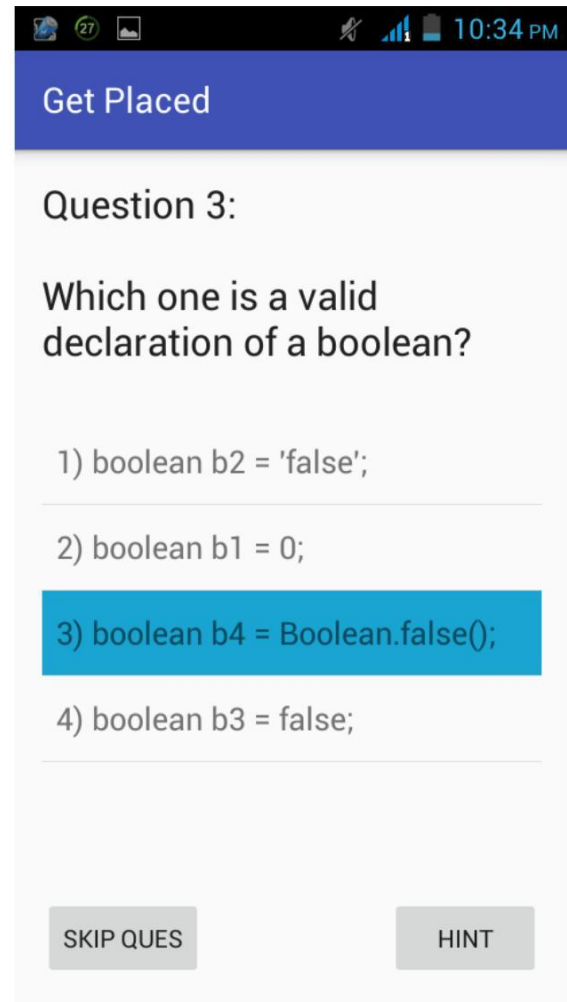
Description:

Once you have selected your company to prepare for from the list of companies you will get an interface where you have to choose on what type of questions you want or what type of format of quiz you want.

5. Questionnaire Interface:

Snapshot 9   Snapshot 10

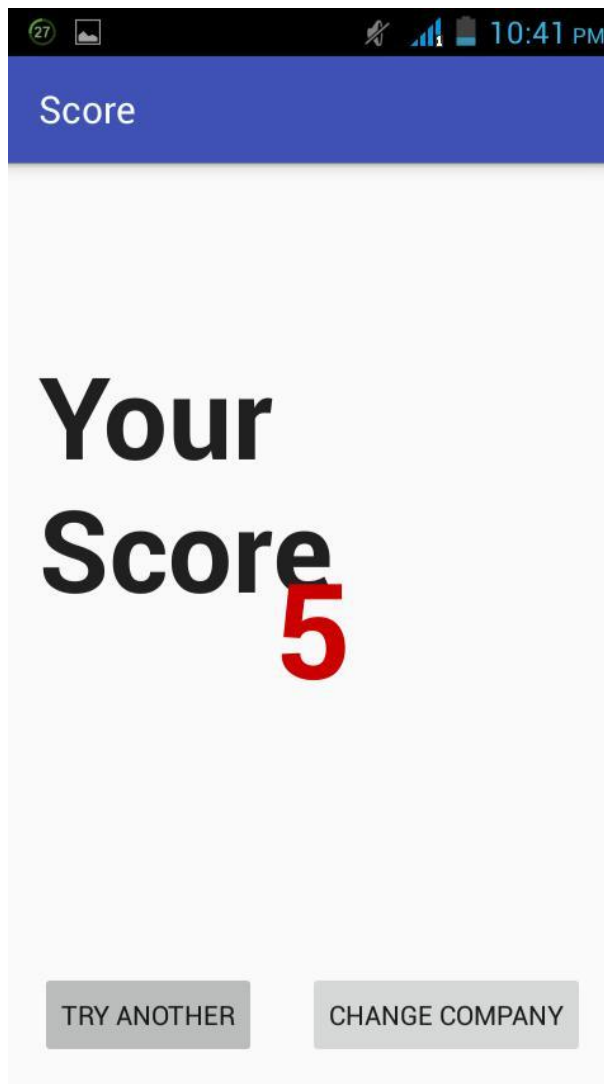**Description:**

Here you will see we have illustrated the questionnaire interface where the interface consists of the question with its four options given. This interface will come after you choose what type of questionnaire you want. Also features like Skip Question and Hint are also given for the ease of the user if the user doesn't know the answer to the question he may choose any of the two.

6. Scoreboard:

Snapshot 11

Description:

This section displays your overall score in the particular type of questionnaire you have chosen. Here you can directly go back to trying another type of questionnaire or you may want to change the company that you are giving quiz for. This simplifies and eases up the efforts of the user.

CHAPTER-4: PERFORMANCE ANALYSIS

4.1 Theory

Performance of rapidly evolving mobile apps is one of the top concerns for users and developers nowadays. Despite the efforts of researchers and mobile API designers to provide developers with guidelines and best practices for improving the performance of mobile apps, performance bottlenecks are still a significant and frequent complaint that impacts the ratings and apps' chances for success. However, little research has been done into understanding actual developers' practices for detecting and fixing performance bottlenecks in mobile apps. The theory stated here are the results of an empirical study aimed at studying and understanding these practices by surveying 485 open source Android app and library developers, and manually analyzing performance bugs and fixes in their app repositories hosted on GitHub. It categorizes actual practices and tools used by real developers while dealing with performance issues. In general, the findings indicate that developers heavily rely on user reviews and manual execution of the apps for detecting performance bugs. While developers also use available tools to detect performance bottlenecks, these tools are mostly for profiling and do not help in detecting and fixing performance issues automatically.

Manual execution of apps is usually accompanied by using specific tools (e.g., Traceview, Eclipse MAT) or addhoc practices (e.g., adding debugging statements with time measurements) that support observation-driven analysis of performance problems. Surprisingly, the results point to the fact that developers do not rely on existing static analysis tools for detecting performance bottlenecks. Although a large number of tools for dynamic analysis are available, these tools neither support automatic detection of performance bottlenecks nor provide developers with suggestions about how to fix the bottlenecks. Regarding the practices for fixing performance bottlenecks, the most frequent practices are the usage of multi-threading to avoid lengthy operations in the main thread, GUI optimizations for reducing the complexity of the UI, and caching to avoid redundant, blocking, or time consuming resource accesses.

4.2 Practices for Improving Performance Bottlenecks

There are basically five important categories in which we can classify and merge every basic practice into. These are: GUI lagging, Memory bloat, Energy leak, General-purpose, Unclear-benefit. The first three categories represent practices aimed at solving corresponding bug types (e.g., GUI optimization aims at reducing "Application Not Responding-ANR" errors and GUI lagging). The last two categories are for general-purpose cases (e.g., profiling) and when the perceived benefit is unclear. As the answers illustrate, the set of practices used by developers is diverse.

Table 4.1

PRACTICES FOR IMPROVING PERFORMANCE BOTTLENECKS: CATEGORIES, GROUPS

Category	Group
GUI lagging	Threads, GUI optimization, Caching, Memory management, Network resources, Avoid blocking operations, Delegation(cloud), On-demand resources, Others
Memory bloat	GUI optimization, Memory mgmt., Network resources, On-demand resources, Etc
Energy leak	Delegation, Reduce GPS calls, Wakelock
General	Design, Optimizations, Observation-driven analysis, Testing, Native code, APIs, DB-optimizations
Unclear benefit	No reflection, Depend. injection, Recursion

The table summarizes the taxonomy of practices. In particular, the table lists the high-level categories, the groups of practices linked to the categories, and the number of answers including a practice in the groups oriented to the corresponding category.

4.2.1 Improving GUI lagging

Lengthy operations can impact app responsiveness and smoothness and result in GUI lagging or ANR (Application Not Responding) crashes. Both scenarios are usually triggered by blocking operations that run in the UI thread. In fact, threading-related practices are the most frequent way used by developers to deal with GUI lagging and ANRs.

The following answer illustrates this case:

As far as Android is concerned, improving performance is generally easiest to do by way of reducing memory consumption rather than raw algorithmic performance. GC runs are expensive, and avoiding them is key to smooth performance. Also, many inexperienced Android devs simply do too much work on the main thread; most app sluggishness isn't caused by CPU spikes at all, but rather, the fact that these spikes occur on the main thread instead of a background thread. Using Handlers to shift work off the main thread generally results in much better app performance, and having sane a threading model and smart memory allocation generally does much more to increase performance than "tweaking" algorithms for speed.

4.2.2 Improving Memory bloats

Excessive memory consumption in mobile apps can cause "Out Of Memory" (OOM) errors or frequent Garbage Collection (GC) events (i.e., automatic invocations) that are triggered when the allocated memory goes beyond a prede- fined threshold. The latter can also impact responsiveness, because GC events can stop apps from executing in order to free memory. Developers improve memory-related issues by relying on several practices including GUI optimization, memory management, source code optimizations (e.g., avoid instantiating objects in loops), delegating operations to remote services, and invoking resources on demand. The respondents confirmed that GUI optimizations are not only useful for avoiding GUI lagging but also for reducing the memory allocated by the GUI: "Most of the apps I have developed have memory related issues. I usually solve them by image compression techniques, reusing bitmaps and caching."

Due the bottleneck be the rendering, and the creation of new objects(memory allocation), we improved the performance using an object pool so that we could reuse objects. But there is possible few solution patterns: background loading of heavy data or memory allocation improving (reduce count of new objects, e.g., using different object pools, especially for big objects like bitmaps, to reduce load on GC). Thus, good programming practices such as reusing objects, avoiding object instantiations in loops, and using appropriate data structures, are common practices reported by the participants since excessive memory allocations trigger GC events that can drastically impact performance of Android apps.

4.2.3 Energy leaks

Although the survey did not ask specifically about energy leaks, two participants mentioned that wakelocks and GPS calls impact the memory consumption. Both are pretty well known in the research community as threats to increases energy consumption and have been previously analyzed by researchers. In addition to reducing wakelocks and GPS calls, we included service delegation as a practice for reducing energy consumption (see Table above). Executing expensive computations on remote servers reduces execution time and resource consumption, which can also lead to reduction in the energy drawn from the battery.

4.2.4 General-purpose practices

We used this category for answers describing:

(i) High-level methodologies or observation-driven practices (e.g., "Profiling performance and memory using Android and IDE tools."), and

(ii) Practices that can improve performance without focusing on specific performance bugs (e.g., APK optimization, improving algorithm implementation). In many cases, participants mentioned "design", "best practices", "guidelines", "design patterns", "refactoring", and crowd-based documentation (e.g., Stack Overflow) as a method for preventing performance bottlenecks or finding a solution when a bottleneck is detected. In many cases, observation-based practices were described or mentioned; these practices include profiling, code reviews, debugging, cross-platform checks, algorithm analysis.

4.3 Conclusion

Our key points can be summarized as the following:

(i)   Android developers primarily rely on manual testing and analysis of the reviews for detecting performance bottlenecks

(ii)   Android developers prefer tools for performance profiling and debugging their apps

(iii)   The most frequent practices used by the Android developers for fixing performance bottlenecks include the usage of multi-threading to avoid lengthy operations in the main thread, GUI optimizations for reducing the complexity of the UI, caching to avoid redundant or blocking/time consuming resource accesses, memory management to avoid GC events and OOM errors.

The following lessons are emphasized based on our analysis:

(i)   There is a need for tools that automatically detect performance bottlenecks

(ii)   Developers need to follow the guidelines and best practices, because mobile apps are more prone to performance problems

(iii)   Developers need to be careful when following existing practices for fixing the bottlenecks, because there may be a tradeoff between the targeted quality attributes (e.g., responsiveness vs. memory management)

(iv)   Developers need to use APIs carefully, because suboptimal usage of the APIs can be a source of performance bottlenecks.

CHAPTER-5: CONCLUSIONS

Conclusion and Future Scope:

The main objective of our application was to make an android app where all the students aspiring to prepare for their placements and related exams can find a resource where they can find everything helpful to them. The main advantage of our app over other apps is that here you can find all the different type of categories and functionalities here. You don't have to go searching out for a different app that helps you with aptitude and then find another app that helps you with java or programming related questions. You can find all of them here under the same app with variety of questions ranging from a wide range of topics.

Also one of the major advantages of this application is that you can find all the company specific data and resources for preparation of that particular company in the same application and also that is available in sorted format.

This application is basically made by keeping in mind the requirements of the students who are preparing for the placement exams for the first or second time because it doesn't contain that advanced level of preparation methodology and the advanced questionnaire for the advanced level of aspirants. But undoubtedly this application fulfils the necessary requirements that an aspirant needs to help him in preparation for their upcoming placement exams.

The more the application will be used by the users, the more will it become better every time because the more it is used, the more will we know about the problems and response towards and the application and the more can we make it user friendly. This is generally done in the beta phase of the app development where the developers analyze the faults in the application by using the feedback given by its users.

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