Exam MCQ App

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Abstract: The Exam MCQ App aims at the modern educational system, for making it easy to conduct online exams smoothly. This application is developed for educational purposes to enhance the online mode examination process. The app provides two user platforms one for the teachers and other for students. The teacher interface includes adding new subject or category upon which students are supposed to be tested. It also has functionality of adding new sets according to the requirement. The idea of different sets avoids mass cheating among student which reduces the worth of examination process. Teacher's interface has functionality to add questions either manually by pressing add button or by attaching excel sheet consisting of questions. On the other side student's interface has got options for selecting subject and then the sets get assigned to them in a random manner. Then they are moved to question activity which consists of questions in the MCQ format. After completion of quiz, we get the results instantly. Students can also bookmark questions for future reference.

Index Terms - **Random manner, MCQ (Multiple-Choice Questions), Bookmark, Interface**

I. INTRODUCTION

Due to covid-19 situations, colleges and schools are closed which makes teachers and professors hard to track their student's progress. Maintaining the complete authenticity in the virtual mode as that of classroom-based learning is difficult. Since online evaluations taken by the teachers are not reliable because everyone gets the same set of questions which leads to mass cheating.
Exam MCQ Application can be used to tackle the existing difficulties faced by the universities. The purpose of this app is to help teachers to conduct the exams in a smooth and efficient way by following the MCQ format. The inspiration for this idea is from the Online Exams conducted by the universities. This app has been programmed to closely observe the loop holes of existing applications and provide the optimum solution for it.

II. LITERATURE SURVEY

A. Survey of the existing system

The below figure gives brief idea on existing systems with their features, platform and supporting devices.

Table. 1. Literature survey

SR NO.	NAME	FEATURES	PLATFORM	SUPPORTING DEVICES
1.	Infuse Learning	Teachers could develop quizzes with several different types of questions	free response system	All devices with internet connection.
2.	Quiz Socket	Teachers do not have to create an account, but could create the quiz directly without any type of requested information.	free response system	All devices with internet connection.
3.	Kahoot	This tool offers an original option that is to release the quiz simultaneously to all the students and they could answer the questions managed by the teacher who controls the pace of the Kahoot quiz by imposing a time limit for each question.	Application	All devices with internet connection.
4.	Verso	The strategy of Verso tool is that students could not see the contributions and responses made by other students in their class until they have posted their own ideas or responses.	Application	Mobile, Laptop ,Ipads.
5.	Google form	To create forms for registration, quiz for tests/exams, create a quick opinion poll, surveys, document submission and much more.	Web Application.	All devices with internet connection.

B.   Limitation of the existing system

Through the survey it is observed that all these application software have some limitations and restrictions. The limitations observed are:
   i.   Lack of randomization of question paper sets.
   ii. Difficulty in analysing and correcting the forms.
   iii. Same set of question to all the candidates, which increases the threat of malpractice.
   iv. Less authenticity, because no unique ID is provided to individual users.
   v.   Questions can be copied and pasted into a search engine.
   vi. Students cannot analyse their progress thus no scope for improvement.

III.   PROPOSED SYSTEM

This Exam MCQ App will contribute towards the educational field by providing an easy and convenient way of taking examinations online. This application is programmed using JAVA programming language which is robust and Object Orientated language data and software is Android Studio. It has been designed by keeping in mind about the feasibility and minimum availability of parameter with user to use this software, so that it could be easily operated by any user. This application provides features by which teachers will be able to provide different Sets of paper to different students. The paper gets distributed in random format. Student will be able to check their marks at the end after submitting the paper and will also be able to see number of correct and incorrect answers. Topic wise distribution as well performance graphs are available after the test such that they can analyze their mistakes and have a huge scope of improvement.

A.   Architecture/Technology used

The apps layout is designed in a user- friendly manner to make it feasible to work with. The basic function lies in making cheat proof quizzes for examination purposes. This application:
   i.   Contains two interfaces one for the teachers and other for the students
   ii.   Contains login credentials for all the users.
   iii. Contains different tabs for different subjects.
   iv.   Contains different tabs for sets being created for that particular subject.
   v.   Random function used will generate random questions.
   vi.   Correct answers are highlighted green.
   vii. Wrong answers are highlighted red.
   viii. Score is recorded and shown at the end of the quiz.
   ix.   The app provides graphical analysis based on the performance of the student.
   x.   To avoid cheating copying the question is forbidden. [2]
   xi.   The student will be able to bookmark the doubtful to refer them after the exam.
   xii. Teacher's interface allows teachers to add question manually or by uploading excel sheets.
   xiii. Teachers can also add different sets and categories.
   xiv. Teachers will be able to keep a track of their students in a smooth and efficient manner.
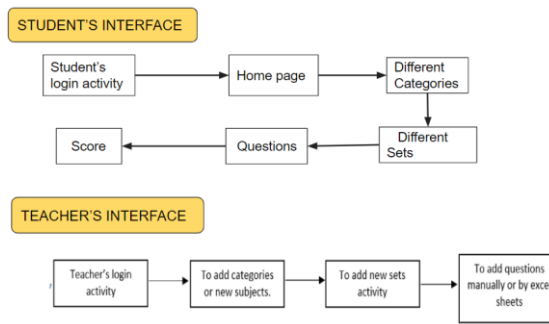
Fig. 1. Flowchart of proposed system.

Fig 1 explains flow of student's interface and teacher's interface. In student's interface first login page is shown for authentication purpose then it is navigated to home page. Tabs for different subjects are shown. After selecting a particular subject, the sets present for that particular subject are shown.

In teacher's interface first login page is shown for authentication. After log in activity to add different subjects and decide the number of sets is displayed. In each set teachers can add questions either manually or by excel sheet.

B. Algorithm and process design

i. Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems or as a subscription-based service in 2020.It is a replacement for the Eclipse Android Development Tools (E-ADT) as the primary IDE for native Android application development.[5]

ii. XML stands for extensible markup language. A markup language is a set of codes, or tags, that describes the text in a digital document.

iii. Android applications use XML to create layout files. Unlike HTML, XML is case-sensitive, requires each tag be closed, and preserves whitespace.

iv. First, we design UI with the help of activity_main.xml.

v. There are many types of layout present in android studio like Linear Layout, Relative Layout, Constraint Layout, Table Layout, Frame Layout, List View, Grid View, Absolute Layout.

vi. Here the parent layout is a Linear Layout whose orientation is set to vertical. Inside it, there is one Image View, one Text View, two Buttons, and two Image Button. The Button and Image Button are inside a child Linear Layout for horizontal orientation. Image View is used for displaying image and Text View is used to display the question and Button is used to indicate true/false and Image Button for navigating to next/previous question.

vii. Android applications can be built using two programming languages java and kotlin. This application is built using java. Java is a popular object- oriented programming language which contains classes, which are used to define objects, and methods, which are assigned to individual classes.

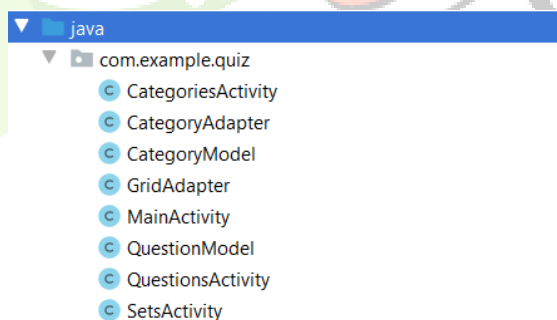viii. We create java class for question model, subject categories and sets activity as shown in Fig-2.

Fig. 2. Java classes

ix. In Android, Adapter is a bridge between UI component and data source that helps us to fill data in UI component. [1]

x. Working with MainActivity.java - on Create () method is invoked first when the app is launched. Question [] array is instantiated with question Id and right answer to the question. setOnClickListener () method is invoked whenever Button/Image Button is clicked, so when the user clicks a button it checks for its Id by getId () method and performs actions as per our logic. update Question () updates question by set text () method of Text View and changes images by keeping track of question number. check Answer () method checks the original answer with the button clicked and uses Toast to display text accordingly.

xi. Teacher's interface is almost same as that of student's interface, although teacher's interface has additional activity which allows teacher to add new category or new subject tab. After adding new category, teachers can as well add new sets. After adding new sets teachers get option to add questions manually or add questions through excel sheet.

xii. For maintaining backend, we use firebase which is reliable and extensively used for android applications.

xiii. Google Firebase is a Google-backed application development software that enables developers to develop iOS, Android and Web apps. Firebase provides tools for tracking analytics, reporting and fixing app crashes, creating marketing and product experiment. [6]

xiv. The Firebase Realtime Database lets you build rich, collaborative applications by allowing secure access to the database directly from client-side code.

xv. The data in the database is stored in the JSON format and it updates in real-time with every connected client

xvi. The data from the database can be synced at a time across all the clients such as android, web as well as IOS.

IV. EXPERIMENTS AND RESULTS

Once the students login the home page is displayed which is shown in below figure.

Fig. 2. First Page

The various subject categories added by the teachers which gets displayed in the categories activity as shown in the figure.
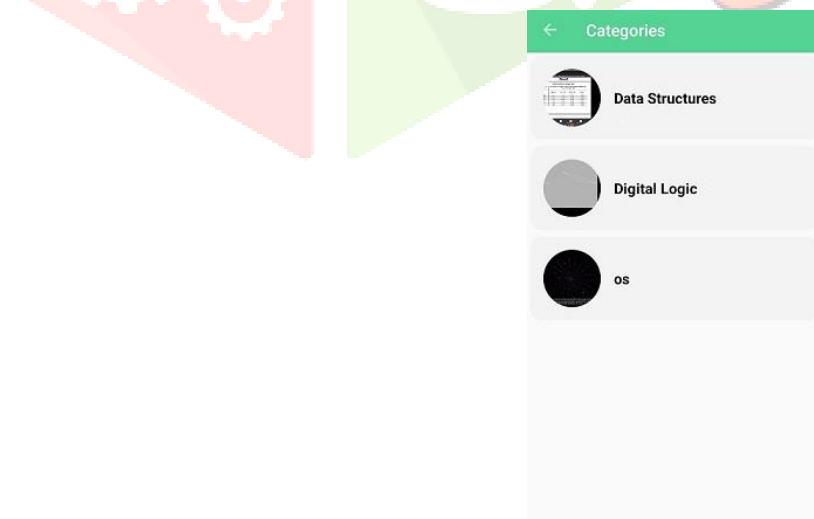

Fig. 3. Students Category Activity

This figure shows the sets which have been added for the respective category.
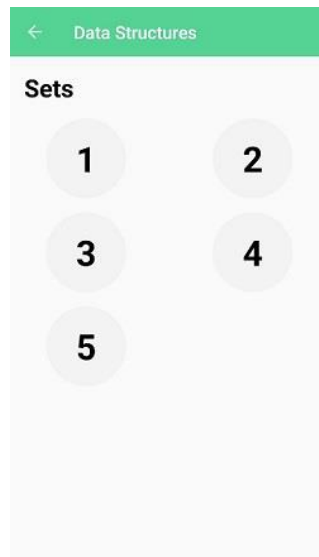

Fig. 4. Sets Activity

The multiple choice questions which will be displayed once the test starts is shown below.
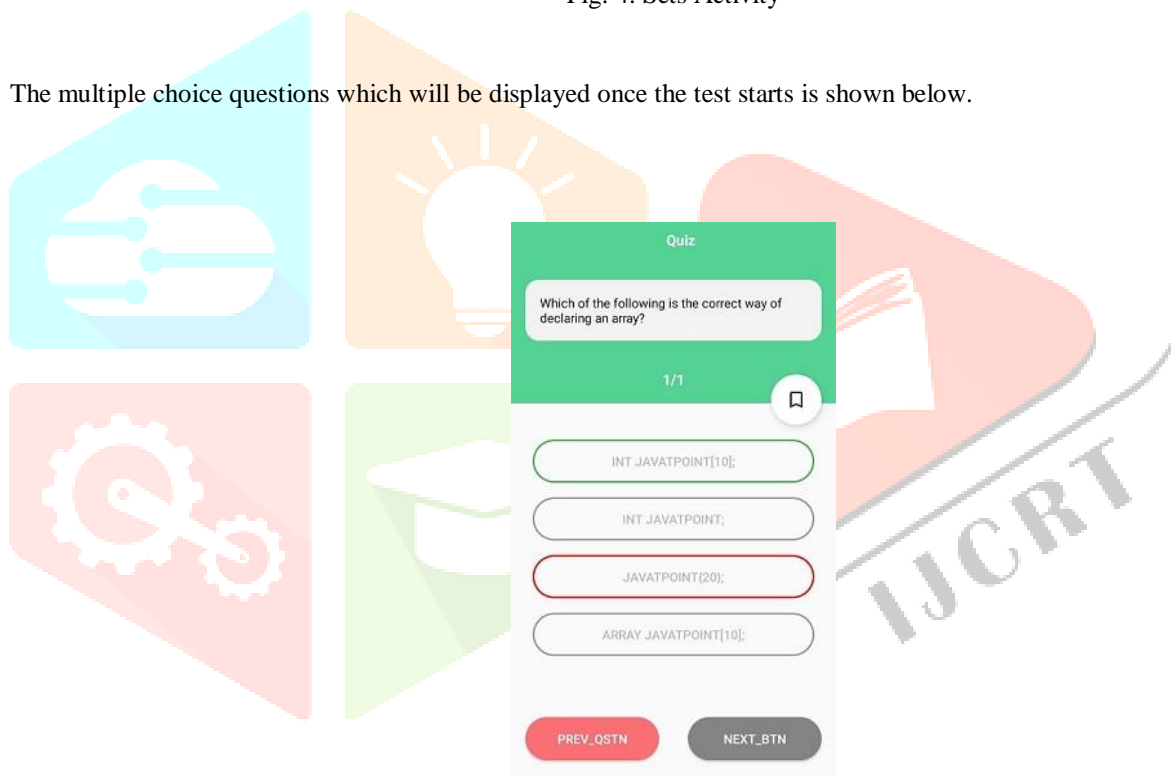

Fig. 5. Questions Activity

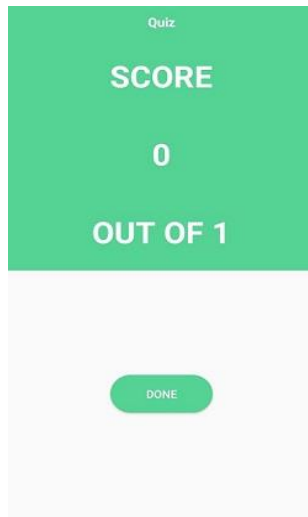Below figure shows the score activity which displays the score for that particular test.

Fig. 6. Score Activity

The teacher's interface is depicted below.

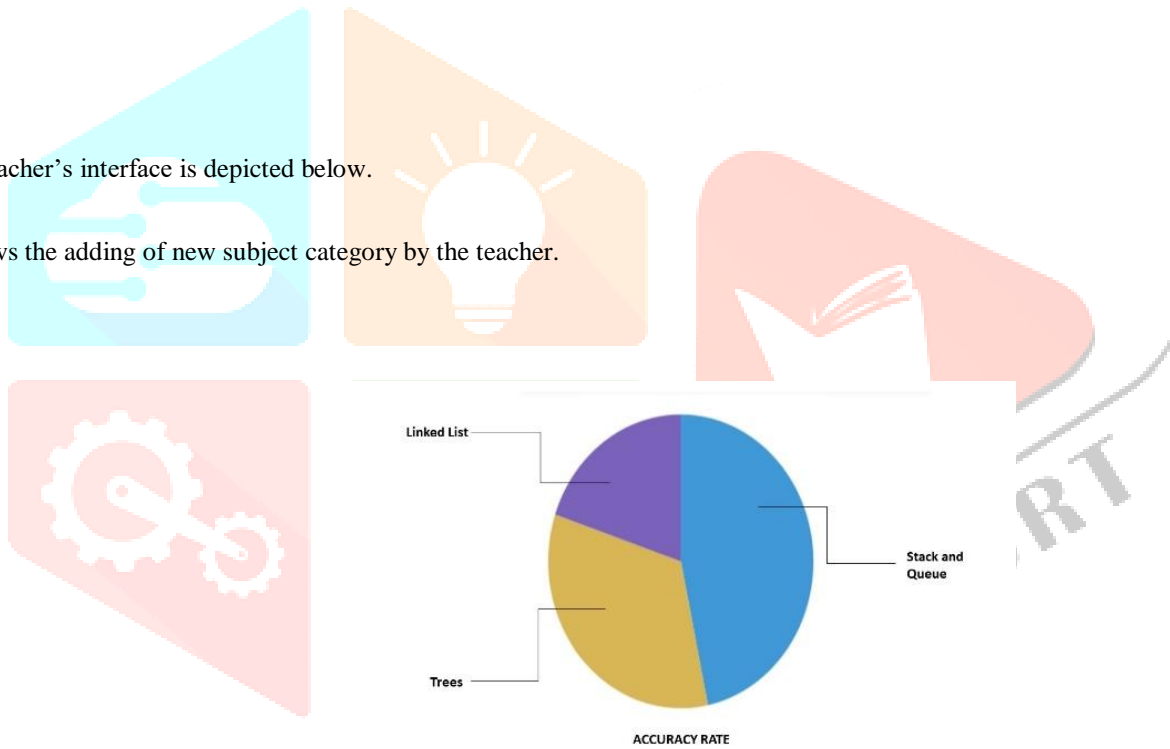It shows the adding of new subject category by the teacher.

Fig. 7. Piechart evaluation of student.
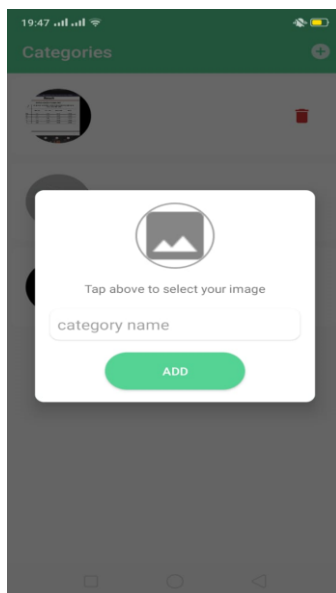
Below figure shows the additions of sets by the teacher.

Fig. 8.Adding new category(Teacher's interface)

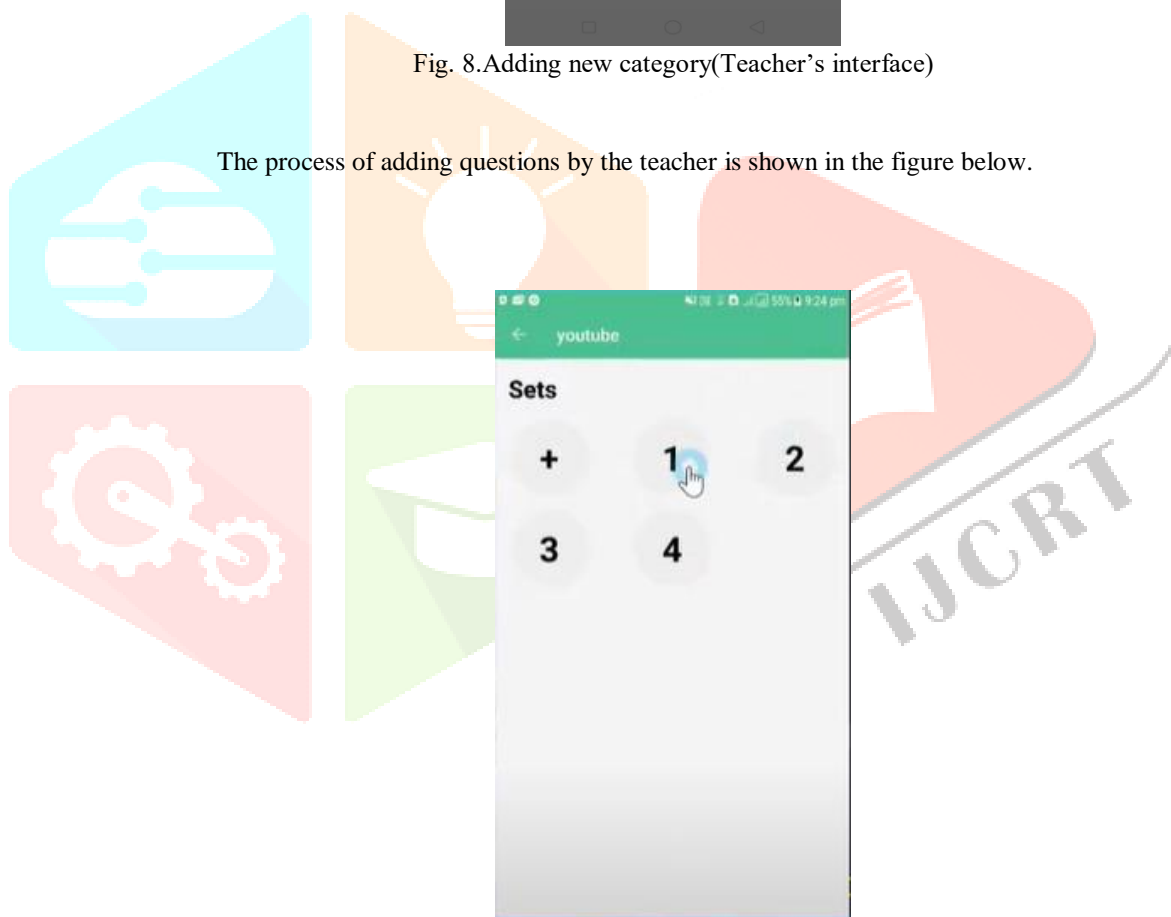The process of adding questions by the teacher is shown in the figure below.

Fig. 9. Adding new sets (Teacher's interface)
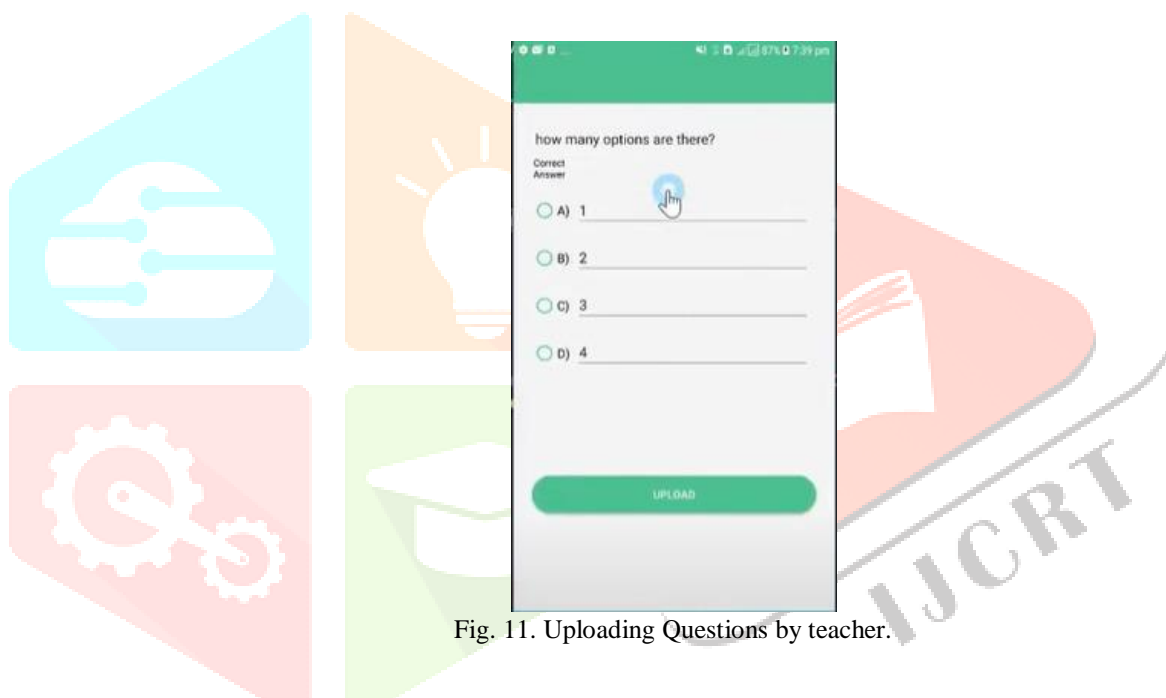
Fig. 10. Adding Questions by Teacher

Fig. 11. Uploading Questions by teacher.

This table explains the format of questions uploaded by excel.

what are function of os?	memory management	file management	process management	all	all
what is full form of os	opeartion system	operating system	operation structure	none	operating system
which of the following is disk scheduling algos?	fcfs	srtf	sjn	none	fcfs
which of the following is page replacement algos?	fifo	srtf	sjn	none	fifo
is kernal part of os?	yes	no	don't know	none	yes

Fig. 12. Questions uploaded by excel sheet.

C. Details of Hardware and software

Hardware-
  i. Laptop/Computer.
  ii. Android Mobile

Software used–
  i. Windows 10
  ii. Android Studio(version-4.1)
  iii. Firebase

V.   CONCLUSION AND FUTURE WORK

Nowadays more than 80% of students are engaged in online learning process, MCQ format tests play a vital role. It not only arouses student interest but also enhances their existing knowledge. In written test student's memory capacity is taken in consideration while in MCQ format analytical and logical abilities are taken into consideration. Unlike offline tests this process is hassle free and instant evaluation for faster results. It will also simplify the exam procedure for students due to its user-friendly nature. This application will also help to overcome the flaws in the existing system like properly categorizing the sections, providing section wise questions, random set of questions, maintaining score board along with a user.

Future Work:
  i.   To detect plagiarism:
        We can add functionality to check the plagiarism of theoretical answers submitted thus reducing chances of cheating.

 ii.   Text to speech:
        Text-to-speech (TTS) is a type of assistive technology that reads digital text aloud. It's sometimes called "read aloud" technology. TTS can take words on a computer or other digital device and convert them into audio.
        we can add this feature for betterment of candidates who find difficulty in reading.

REFERENCES

[1] R. S. Aggarwal," Quantitative Aptitude for Competitive Examinations 26th Edition", S. Chand Publishing, 2017

[2] Sathiamoorthy Manoharan,"Cheat-resistant multiple-choice examinations using personalization", Elsevier Ltd,2020

[3] Android tops 81 percent of smartphone market share in http//bgr.com/2017/07/19/android-vs-ios-market-share2017-q2/

[4] Multiple-Choice Tests Revisiting the Pros and Cons https//www.facultyfocus.com/articles/educational-assessment/multiple-choice-tests-pros-cons/

[5] App Inventor and the Advanced Features https//puravidaapps.com/quiz.php

[6] Android Development Course (Udemy)

[7] Types of Multiple Choice Question +[Examples] https//www.formpl.us/blog/multiple-choice-question-example

[8]https://www.commonsense.org/education/articles/the-best-quiz-and-game-show-apps-for-classrooms