

CS 855

Final Project Write-up: FunTutelage

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I. ABSTRACT

It is deemed that Kids do have a lot of energy and time but do not have sufficient resources to do what they want. Contrarily, Young people do have money and energy but lack of time. Whereas, old people have time and money but not enough energy to do all that they desire. Overall, We can conclude that throughout our life span, there is always something that restrains us from trying something out of the box. Young/Mid-aged and old people are already habitual to a specific pattern of life, but kids are flexible and it is said that a growing mind is a curious mind and for the same reason, this project focus on providing resources and time management for kids. “FunTutelage” is an android application that provides a platform for communication between teachers and students. Since kids are innocent and unaware of what is good or what is bad for them, they usually end up wasting a lot of their invaluable time watching cartoons or unproductive YouTube videos on auto play which affects their physical and mental growth. In solution to this, FunTutelage gives kids an opportunity to be in contact with their mentors via a mobile interface and can do different time-bound tasks that keeps them engaged in educational and productive activities throughout the day. Teachers can post tasks/homework from their end for students who in turn can complete the task and upload its picture on the portal which can be viewed by the teachers. The application has been named “FunTutelage” because learning is an ever going process, this implies it is very crucial for kids to keep themselves committed even when they are at home during evenings or weekends for which they need someone to look after and encourage them to participate in curricular and extracurricular activities as a tutor, hence the name “FunTutelage: tutoring with fun”. FunTutelage is developed in Android Studio using Java as the programming language and Google Firebase as the database. Overall, I have found that FunTutelage is delivering a fun and interactive interface between kids and their mentors and I will add more functionality to this application in future for making it even better in terms of accessibility and usability.

II. APPLICATION DESCRIPTION

FunTutelage is an interactive day to day time management and educational android application designed to employ kids in productive activities in order to learn something new from their phones or tablets especially when they are at home in the evening or during weekends. I planned this application for my cousins(9 years, 5 years) with whom I live in Regina. I realized that kids have great potential and are very quick-witted when it comes to learn something new, but they are always attracted to animated cartoons and sometimes spend continuous 4-5 hours while watching these online shows on YouTube which is not worth their time. The time which they can spend playing some sports, learning new skills, practicing maths or maybe doing some recreational activity is now being wasted on a mere online show which adds no value in their knowledge. In fact, a report[1] shows that excessive screen time either on phone or TV affects children’s mental growth and increases the chances of health issues like obesity, diabetes, and cardiovascular issues. Not only health issues, but excessive screen time also incubates laziness and behavioral issues in them.

FunTutelage, on the other hand, allows a mentor/teacher to make a schedule for kids. In this android application, the Teacher is accountable to post tasks/homework on the application and its deadlines could be a couple of hours. These tasks not only include academic assignments but can be anything that allows a kid to learn a new skill. For example, during the winter season, mentors can ask to make a snowman in the backyard and post its picture as a submission for the task. Or sending some downloadable links of coloring pictures which the students can print out and post it after coloring. The mentor can also send a link to some educational videos from channels like Ted-Ed or SciShow which will indeed make them learn something new and then they can organize a quiz based on those videos.

Since this application is being designed for small kids, the interface has been kept quite simple and eye-catching. The basic working mechanism of this application is that new users(either teacher or student) can register themselves on the firebase authentication server via the application interface. Once registered, the user can log in and access resources, if the user is a teacher, they have the authority to post homework/tasks which will be saved on firebase firestore and can be retrieved by a student user. At the same time, a student user can access the tasks posted by their teachers and after completion, the student can post an image of it on the application which will be saved on firebase storage and only authorized teachers can have access to it. The current version of this application has only one interface for all sorts of activities, i.e academic or non-academic, but with upcoming versions, I will be adding different activities(pages) for different tasks.

III. DESIGN

FunTutelage is developed in android studio using java as the programming language and firebase as the back end database. The concept of the application is to bridge communication between teacher and a student wherein teacher's job is to post a task on the application and evaluate submissions from the student, whereas student's job is to access the task posted by the teacher, perform it and upload an image file of that task for evaluation. In total, this application has 9 activities, which are mentioned in Appendix A.

The application is basically divided into two streams, one is for teachers and the other is for students. On the landing page(Appendix B)of the application, the user has to choose if they are a student or teacher. Either way, they have to log in if they have an existing account otherwise an option to create a new user account is available which is hyperlinked to a different activity. Once logged in, a teacher has access for posting homework or tasks on the activity page which is saved on a cloud database in firebase firestore or the teacher can check the homework/ responses submitted by students previously in form of images(See appendix-C) If a user is logged in as a student, in that case, the user can either see the task posted by the teacher and after completion of the task, the user can upload an image of it on their activity page which will further be saved on the firebase storage which is accessible by teacher(See appendix-D).

For instance, there are two users named "T" and "S". "T" is a teacher and "S" is a student. Both have created a user account and are now logged in to the application. The job of "T" is to provide some tasks for "S" by clicking "Post Homework" button. For now, we have only one module where "T" can share any kind of time-based task. Once "T" has shared a task. "S" on a different location can see the posted task on the click of "Retrieve homework" button. After getting the task, "S" has to perform the given activity and click a picture of it as instructed by "T". Now "S" can upload that picture on click of "Submit Homework" button. Once uploaded, "S's" job is done and now "T" can access the same data uploaded by "S" on his application page and evaluate it accordingly by clicking on "Evaluate previous submission" button.

IV. LIMITATIONS AND FUTURE MODIFICATIONS

Limitations: Considering the time taken to make this application, I would say the application is working pretty well and as expected, but still, there are many areas where there are opportunities for improvement. Since the current version of this application has only one module, Teachers have to give time-based tasks that are sometimes not attainable by all the student users as everyone has different schedules and different priorities. If we add multiple modules like "homework", "games", "physical task", "educational videos", etc. and post all these activities in parallel, it will be easier for students to do things as per their convenience. Another feature that can be added to the application is a recycler view. When multiple students submit their homework, all the image files are stored in the firebase storage, but when the teacher requests to retrieve all the submission, teacher can only view the homework submitted by the last student. The solution to this problem is that we can call all the rows saved in storage in a list and forward that list to mainAdapter of the recycler view where we can use Picasso library to download images and bind them to the recycler view but considering the submission deadline date for this project I have listed this feature to be added in future improvements.

Future Modifications: For future modifications, I will be adding different modules for different kinds of tasks so that a teacher can post all the tasks altogether for a specific date and students can perform those tasks in non chronological order as per their convenience. Also, I will add a recycler view on the teacher's homework evaluation page so that the teacher can evaluate all the submissions at the same time by just scrolling on the screen.

V. CONCLUSION

After following complete software development life cycle while developing this android application, I found out that the application is working as expected with a scope of minor changes to be made in future. It was a learning experience for me while making my first android application in android studio. My initial idea was very ambitious but eventually I have to settle down with some restricted functionalities keeping in mind the time available to design this application. I switched to Java programming language after facing some difficulties with kotlin and used Firebase as a database which I was completely unfamiliar with. I get to learn a lot of new things after a bit of struggle while working on this app, but the experience is worth it. FunTutelage is a recreational application developed with a motive to make kids best utilize their time and it gives them opportunities to perform and learn new things instead of spending their spare time in front of an idiot box which pretends to be 'smart' nowadays. This application is designed in such a way that even small kids can operate it and make their weekends productive. The only challenge could be motivating kids to use this application regularly and for that teachers have to be very creative and post tasks including educational fun activities which retain kid's interest in the app and my job is to maintain it as a responsible interface design and not adding any feature which triggers intermittent positive feedback.

During the testing phase of the application I figured out the need of some additional functionalities which I could not add right away keeping in mind the time constraint to build this app, but I will keep working on adding more useful features and making this application more convenient to use because kids are the future of this world and it's our ethical duty to provide them with sufficient resources so that they can utilize their time and energy for their overall growth.

APPENDIX A

ALL ACTIVITIES IN FUNTUTELAGE

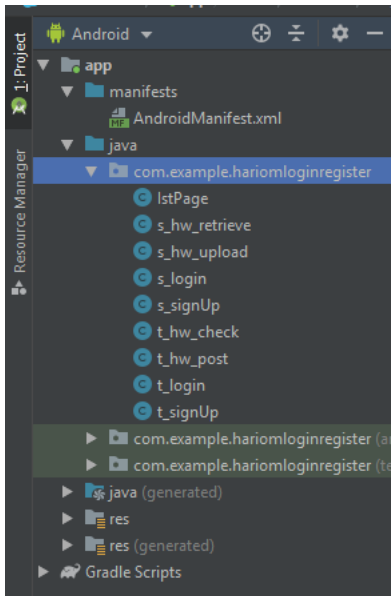


Fig. 1: All Activities in FunTutelage

APPENDIX B

LANDING PAGE OF FUNTUTELAGE

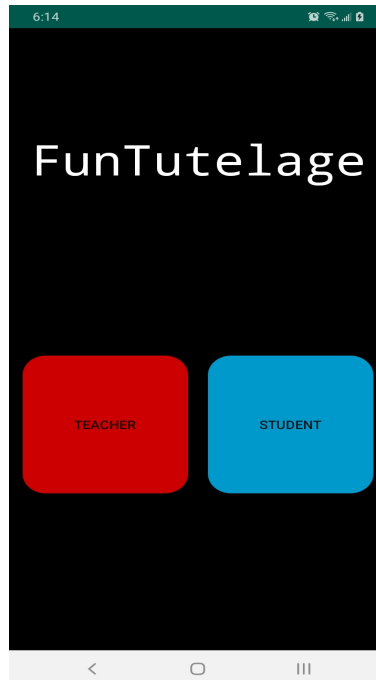


Fig. 2: Landing Page

APPENDIX C TEACHER'S ACTIVITIES

6:14 6:18 6:18 4:15

Write an essay on Global Warming. Type the task here

Email Password

LOG IN

New User?? SignUp here

POST HOMEWORK POST HOMEWORK

DELETE LAST POSTED HOMEWORK DELETE LAST POSTED HOMEWORK

EVALUATE PREVIOUS SUBMISSION EVALUATE PREVIOUS SUBMISSION

RETRIEVE HOMEWORK

GLOBAL WARMING

Homework Posted on Database Successfully

Fig. 3: Teacher's Activities

APPENDIX D STUDENT'S ACTIVITIES

6:18 6:19 6:19 4:11

Today's homework:

Write an essay on Global Warming.

CHOOSE FILE

GLOBAL WARMING

RETRIEVE HOMEWORK RETRIEVE HOMEWORK

CLEAR FIELDS CLEAR FIELDS

SUBMIT HOMEWORK SUBMIT HOMEWORK

UPLOAD FILE

Image Uploaded Successfully

Fig. 4: Student's Activities

APPENDIX E FIREBASE IMAGES

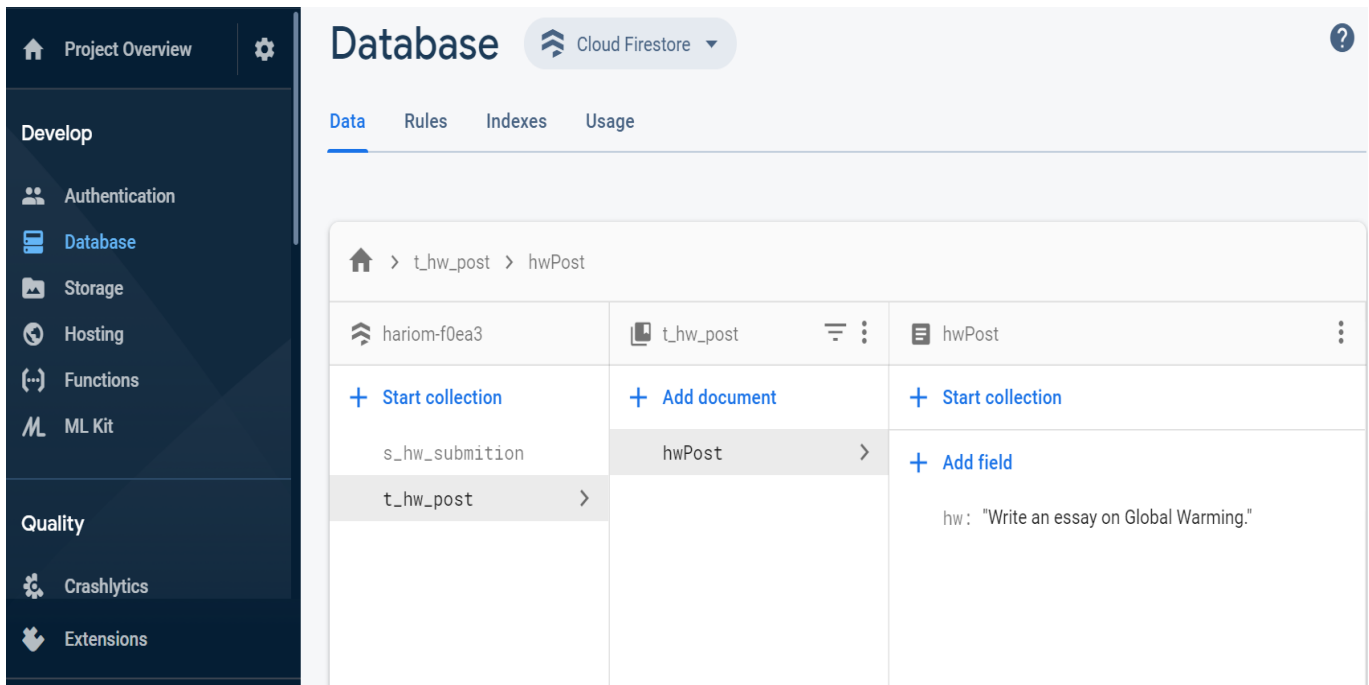


Fig. 5: Firebase Firestore

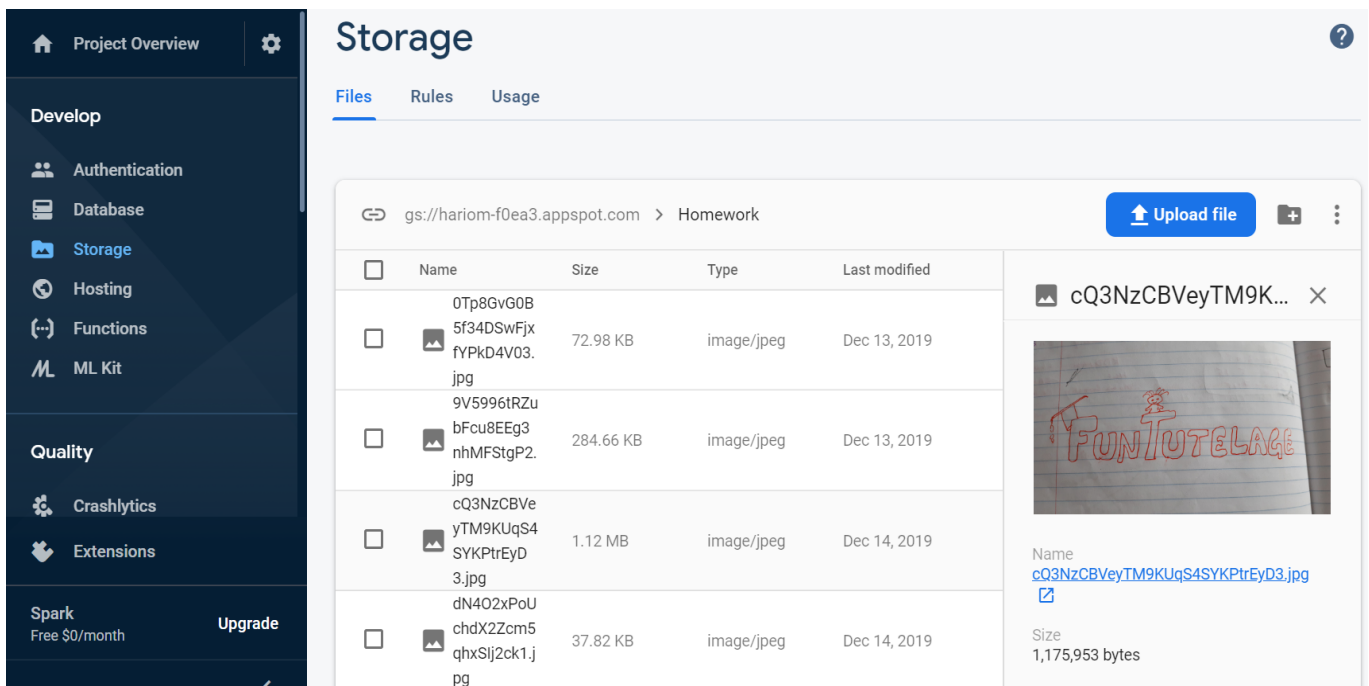


Fig. 6: Firebase Storage

REFERENCES

- [1] University of Michigan Health System. (n.d.). Retrieved from <http://www.med.umich.edu/yourchild/topics/tv>.
- [2] (n.d.). Retrieved from <https://www.youtube.com/watch?v=r4HgdJKM5kot=284sv>.
- [3] (n.d.). Retrieved from <https://www.youtube.com/watch?v=r4HgdJKM5kot=284sv>.
- [4] (n.d.). Retrieved from <https://www.youtube.com/watch?v=r4HgdJKM5kot=284sv>.
- [5] (n.d.). Retrieved from <https://www.youtube.com/watch?v=r4HgdJKM5kot=284sv>.