ASE

Advance Software Engineering
Final Report

Fall 2016

IM Word

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1. Introduction

IM WORD

Our project was to develop a hybrid application “IM Word” which is a word building application. Our focus here was to develop an application which consists of vocabulary building for users of all ages. This application can be used for users to learn new words based on images, increase their knowledge, helps in gaining exposure to new languages.

Each user will be provided with an account by which he/she can access the application. New user can register with the application by giving his/her basic details and can sign up. If the user already has an account he/she can directly login into the application. For this application, we have implemented social login using Google and Facebook authentication using their respective services.

Application consists of two groups, in the first group user has to recognize the word based on the images displayed and it has been divided into 3 levels. In each level the complexity of the word will be increased. As soon as the user completes one level he/she will be navigated to the next level. Users will be regularly updated with the scores. Other part of the application contains identifying a domain/company logo upon some suggestions provided to the user. We have integrated all the features and used REST API’s with an interactive user experience.

2. Project Proposal

2.1 Motivation

Have your ever-felt images are mightier than words? Learning through images is more efficient and easy way to learn when compared to others. It’s very interesting to learn using images which is like playing a game. Moreover, the learning curve with images is exponential and wide. Therefore, we have chosen to develop and application to increase one’s learning ability with images.

2.2 Significance/Uniqueness

There are many other applications for learning with images but our application will be different. Currently we have applications which are designed only for single purpose like recognizing words with images/identifying the logos/famous personality's image identification. But in our application, we are going to integrate all these features into a single application. In addition to these features, we will implement several other features such as, identifying logo of the domain name entered by the user.

2.3 Objectives

The objective is to develop a hybrid application where in the user can login and enhance his learning experience using the features built in. Since we are dealing with images it makes apparent that we should develop an appealing UI which grabs user attention. The application contains initially user login activities which should be secured and we are also going to rank the application users by the number of attempts/levels completed. Image identification, emotion and crowd analytics require an established API.

3. Features

Main features of the application are vocabulary building, logo identification, get logo information, user statistics visualization

Vocabulary building: Here user is displayed with continuous images and the user should recognize the word based on the image displayed. If the user correctly guesses the word he/she will be directed to the next image. Scores are updated in the user account and the user can view the scores at any time. When the user reaches a certain score he/she will be upgraded to the next level. For this feature, we are implementing 3 levels.

Logo Identification: Like images recognition, logos also need to be identified by user. Once the user identifies correct answer he/she will be redirected to next question. User can view the score from the respective account and can play the game any number of times without any limits.

Domain Name to Logo: This feature is really an interesting and stress buster for the user. User can enter company domain name and gets logo of the domain name and more information about the company.

Words pronunciation: Here once the user correctly identifies the word and if he/she wants to know and learn the pronunciation of the word can click on a small button which converts text to speech using an API and the user can hear the pronunciation of the word multiple times.

User Analysis: As all the user scores are tracked in Mongo DB, analysis is done by comparing each level and the time taken for each question. Visualization is done using Google Charts.

4. Project Plan

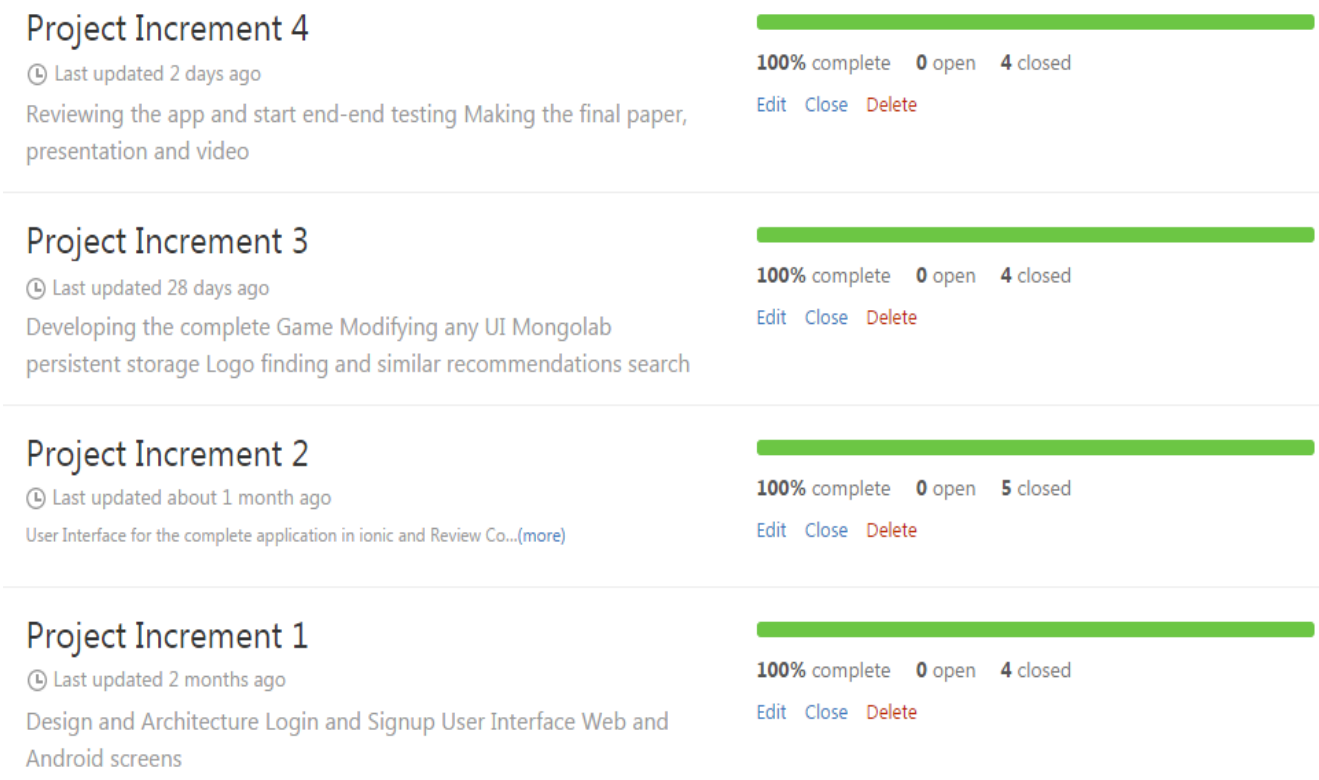
Agile Model is used to develop the project which helped us to develop the project in increments. In agile model, each increment is tested to maintain the quality of application. Due to Agile process changes are easily adapted.

The entire project is divided into **4 increments** and issues are created under each increment. The tasks are assigned to individual team members. Once the tasks are completed it is moved to closed state. The progress of each increment is visualized in Burndown Chart.

Increment	Start Date	End Date	Work Planned
Increment 1	09/03/2016	9/23/2016	User Login and Registration Page Hard Stop Validations
Increment 2	9/24/2016	10/14/2016	Converting Web application to Ionic Application. Using Firebase to store User Details Maintaining User Login and Registration Designing Home Page after user Login Social Login using Cordova Oauth
Increment 3	10/15/2016	11/9/2016	Dividing home page into different sections (Word Game, Logo Game, User Analysis)

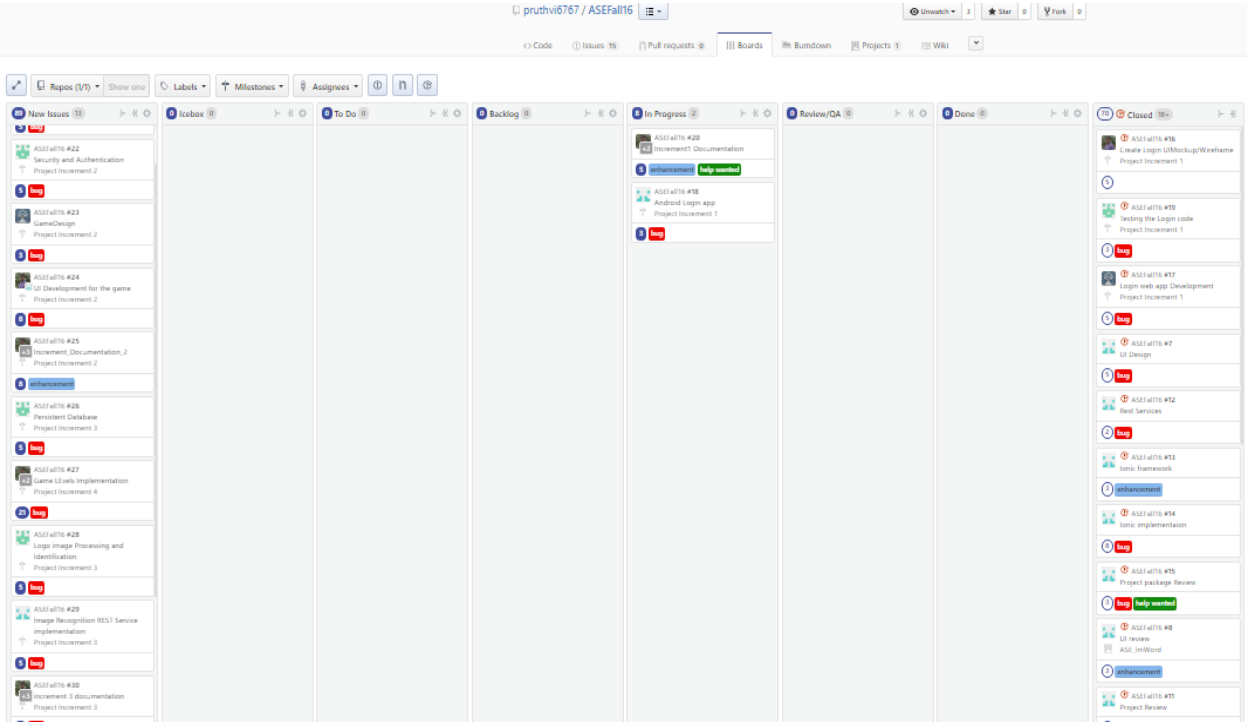
			Getting Logo information from company domain name Handling Settings Page for User Manipulation Uploading images to Google Drive and creating links in Mongo DB. Developing Logic for Word Game
Increment 4	11/10/2016	12/5/2016	Developing Logic for Logo Recognition User Analysis based on different Levels Maintaining user levels and time taken to complete level is tracked in Mongo DB Text to Speech API implementation for words pronunciation

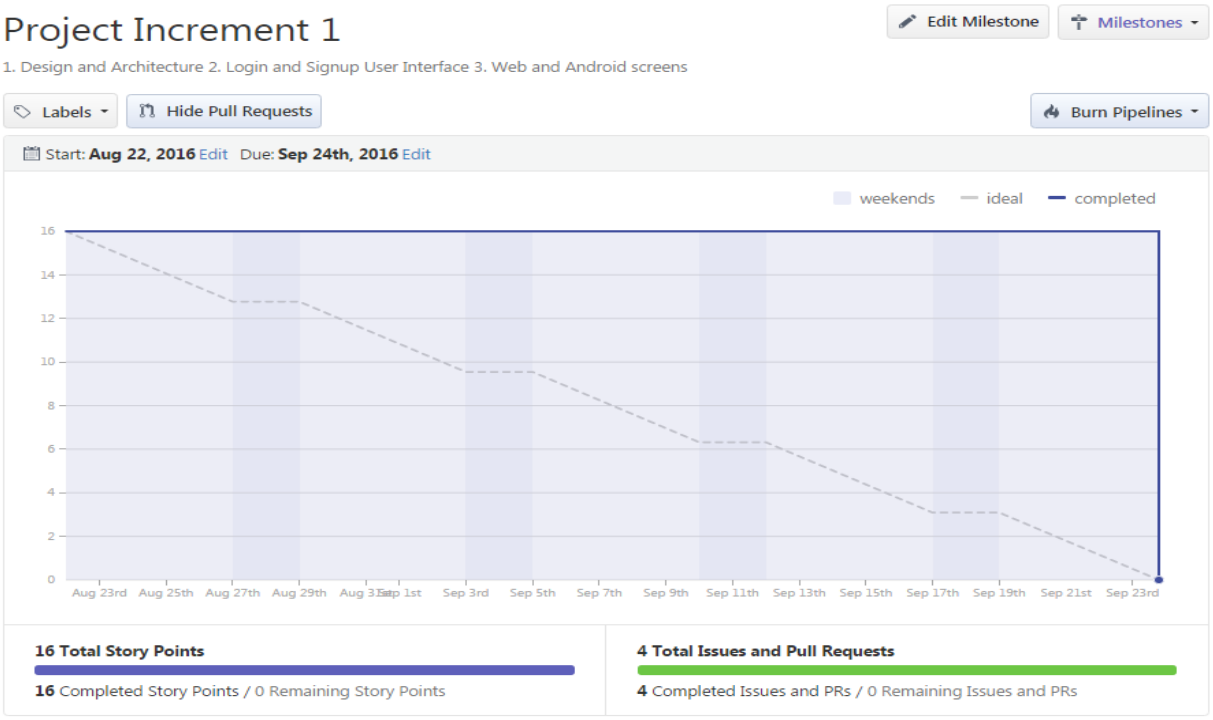
In ZenHub 4 Milestones are created for each increment and issues are created under each milestone and assigned to respective team member.



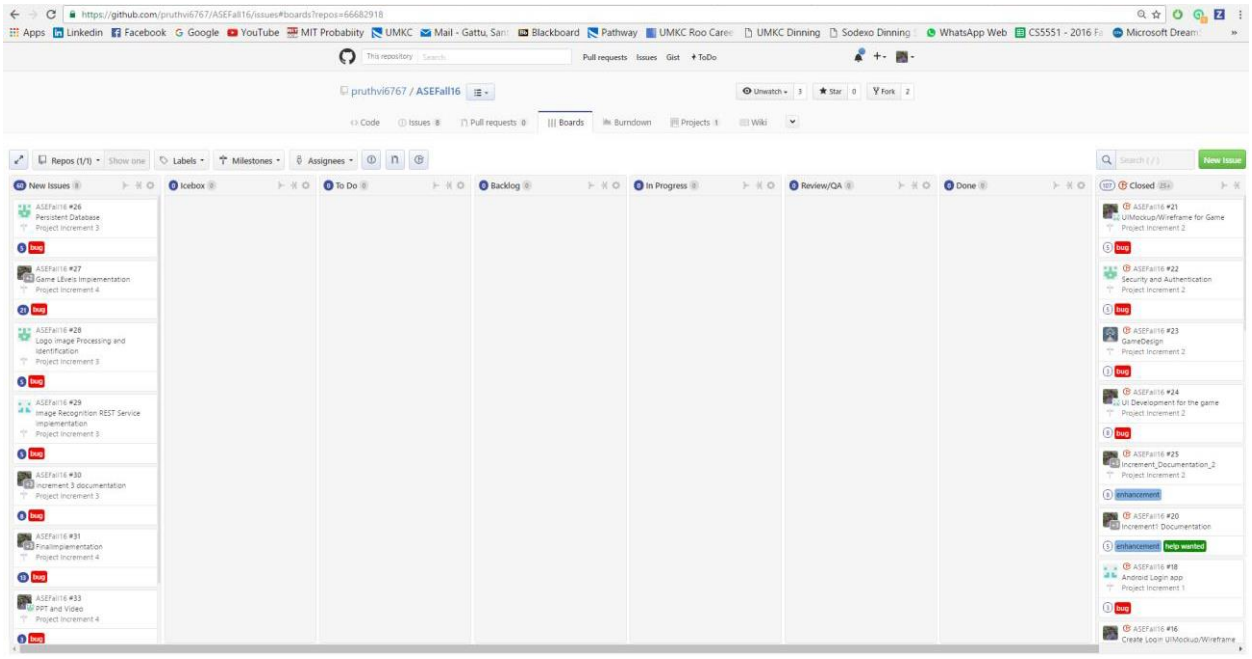
4.1 ZenHub Issues Burndown Charts

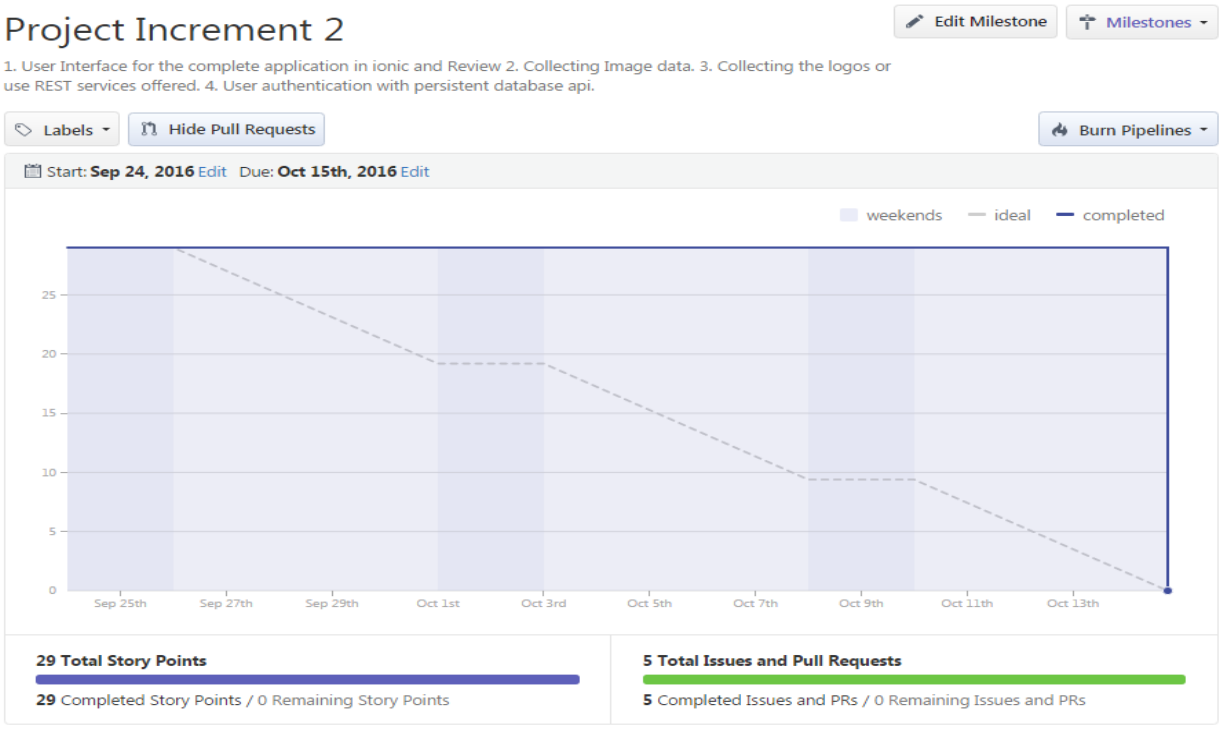
4.1.1 Project Increment 1



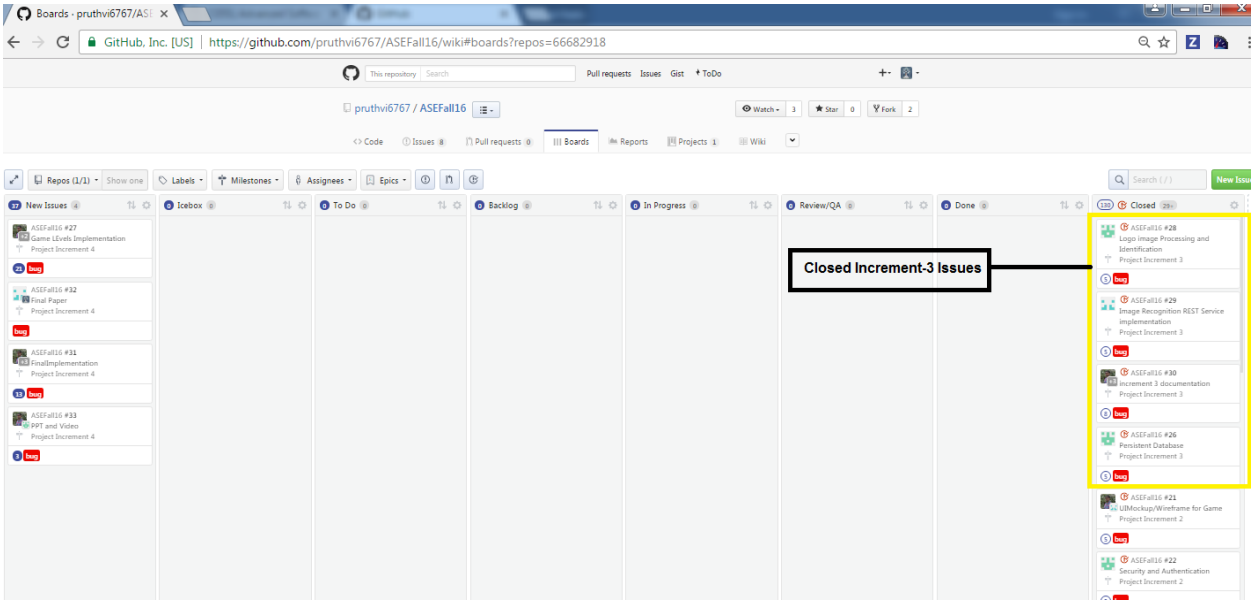


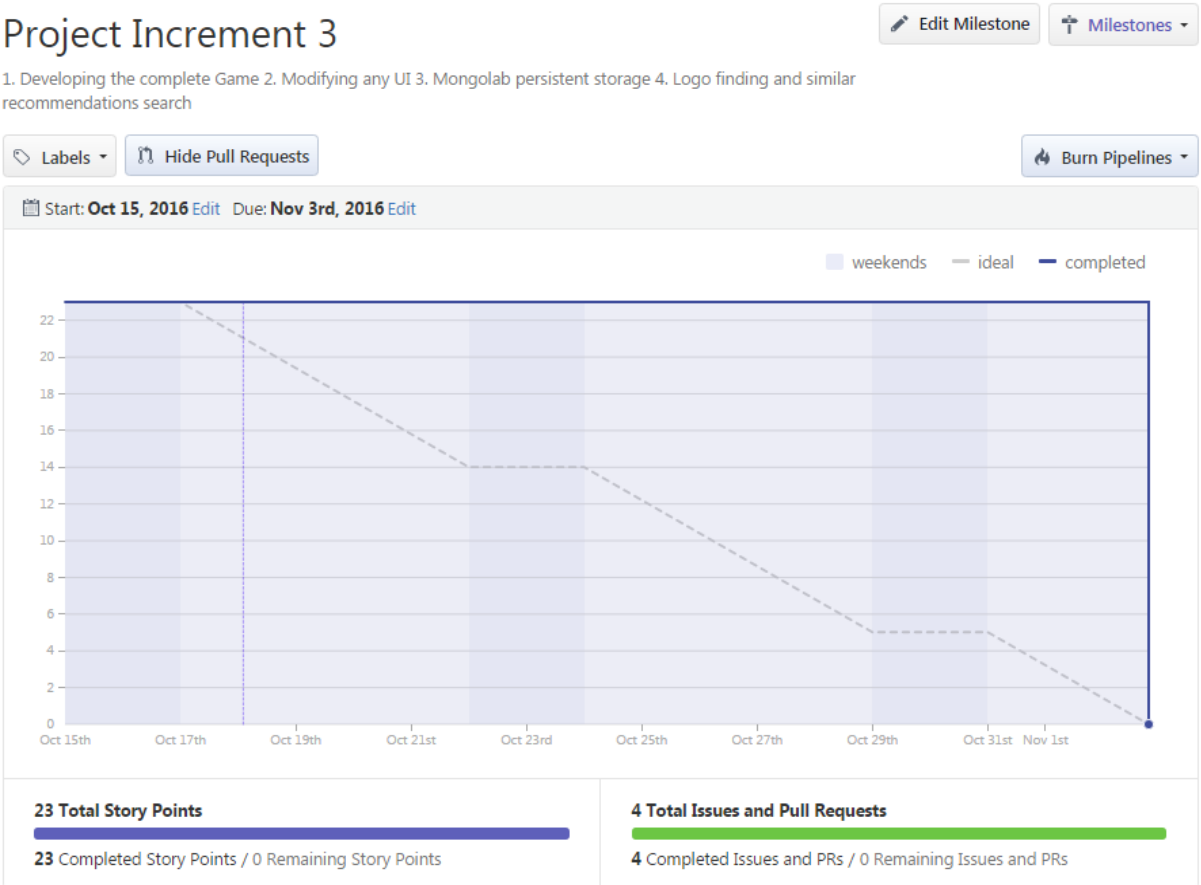
4.1.2 Project Increment 2



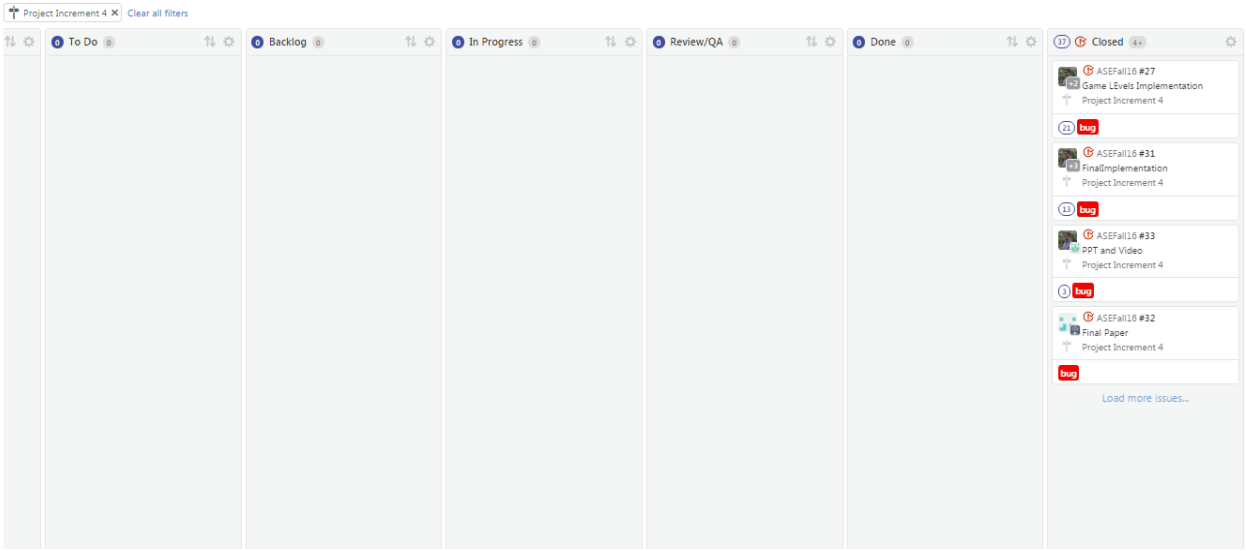


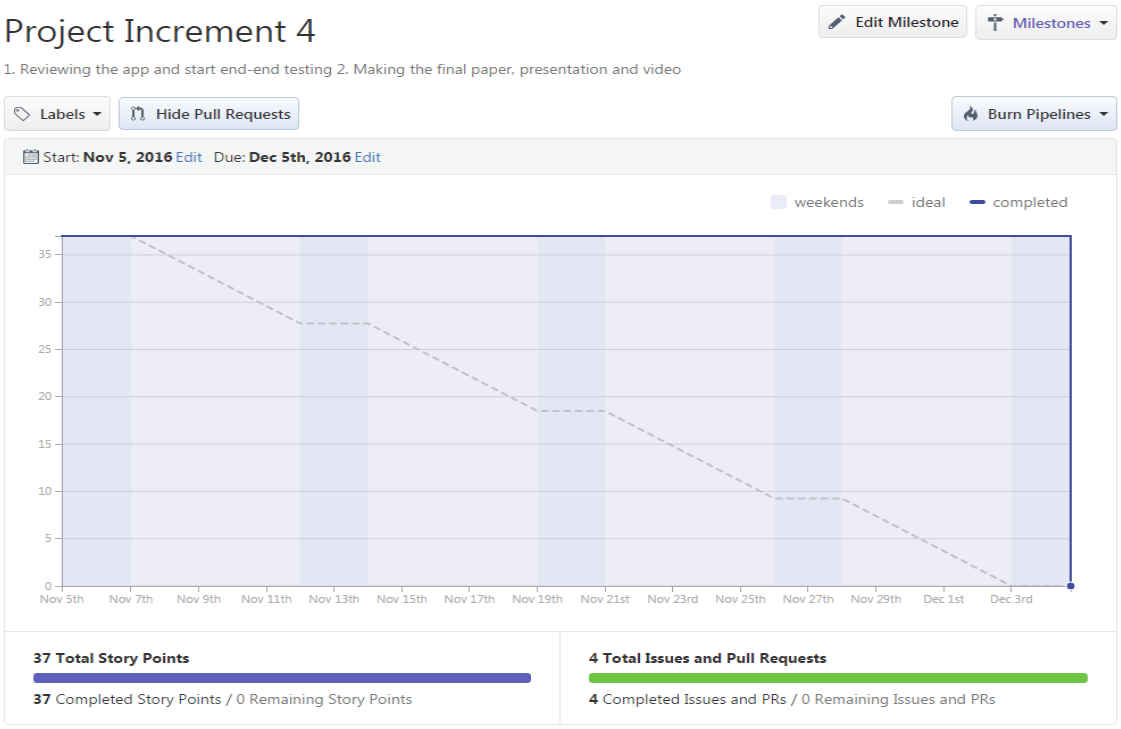
4.1.3 Project Increment 3





4.1.4 Project Increment 4





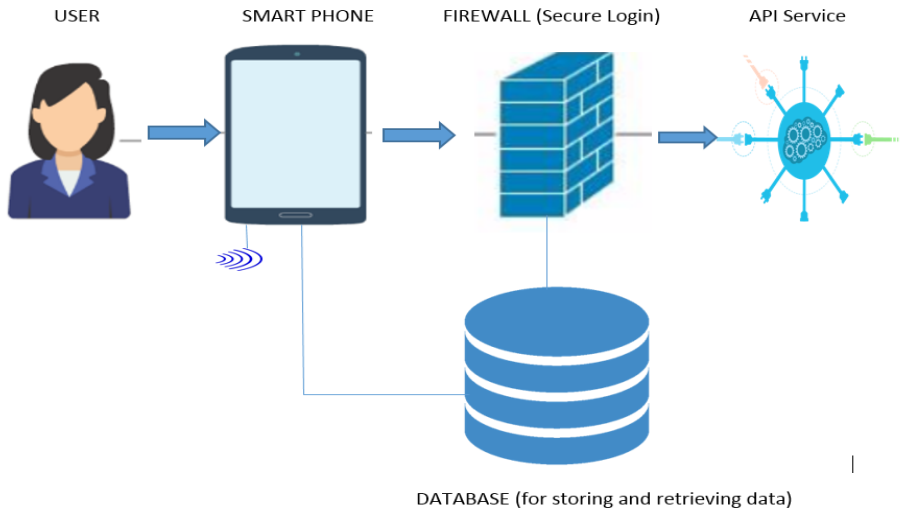
5. Technologies Used & Internal Flow of System

5.1 System Requirements

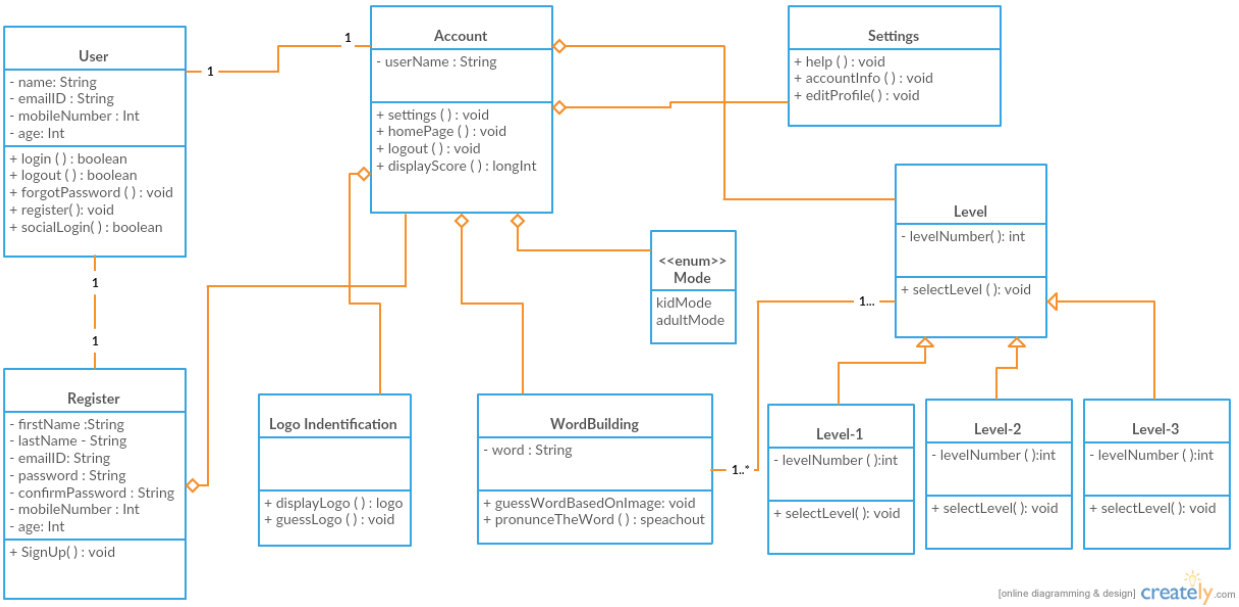
IM Word is an ionic application which uses **WebStorm / Brackets** as IDE. The front end of the application is developed using **HTML, CSS, JSP** and back-end logic is handled in **Angular JS**. **Firebase** is used to manage user details such as user registration, validating user login details, updating user details. Images that are used for game is uploaded in Google Drive and the links are maintained in **Mongo DB**. Along with image URL, the correct answer for image and wiki link for image is stored in Mongo DB. Apart from these details user's levels are also tracked in Mongo DB.

- Operating System: Windows 7 or Above
- IDE: WebStorm / Brackets
- Languages Used: Angular JS, HTML, CSS, JSP
- Ionic Framework
- Firebase
- Mongo DB
- Logo Recognition: Full Contact API
- Cordova Oauth (Facebook, Google)
- Text to Speech API
- Google Charts: Graph Visualization
- InAppBrowser Plugins

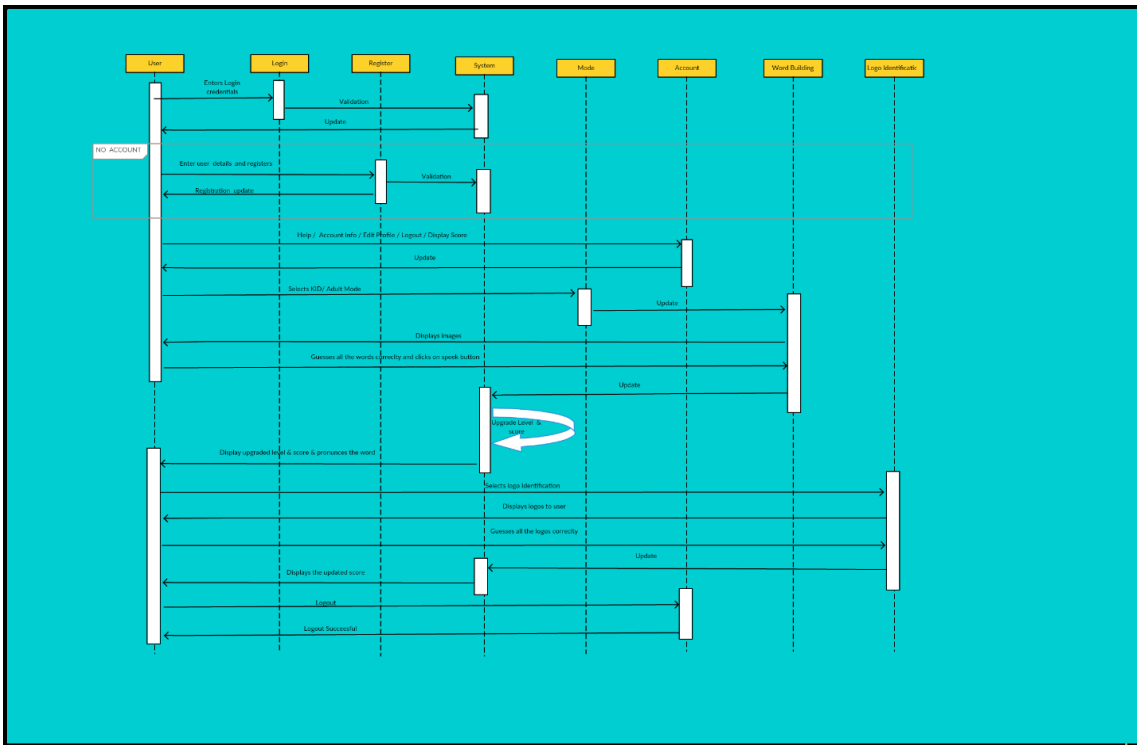
5.2 System Architecture



5.3 Class Diagram



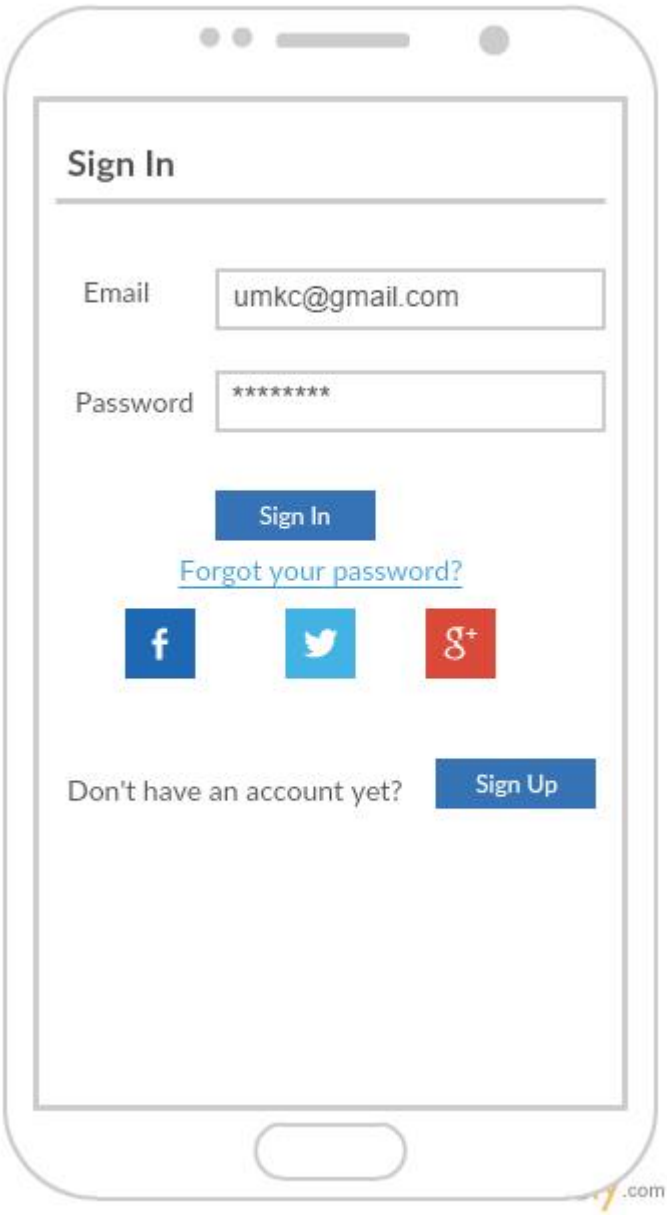
5.4 Sequence Diagram



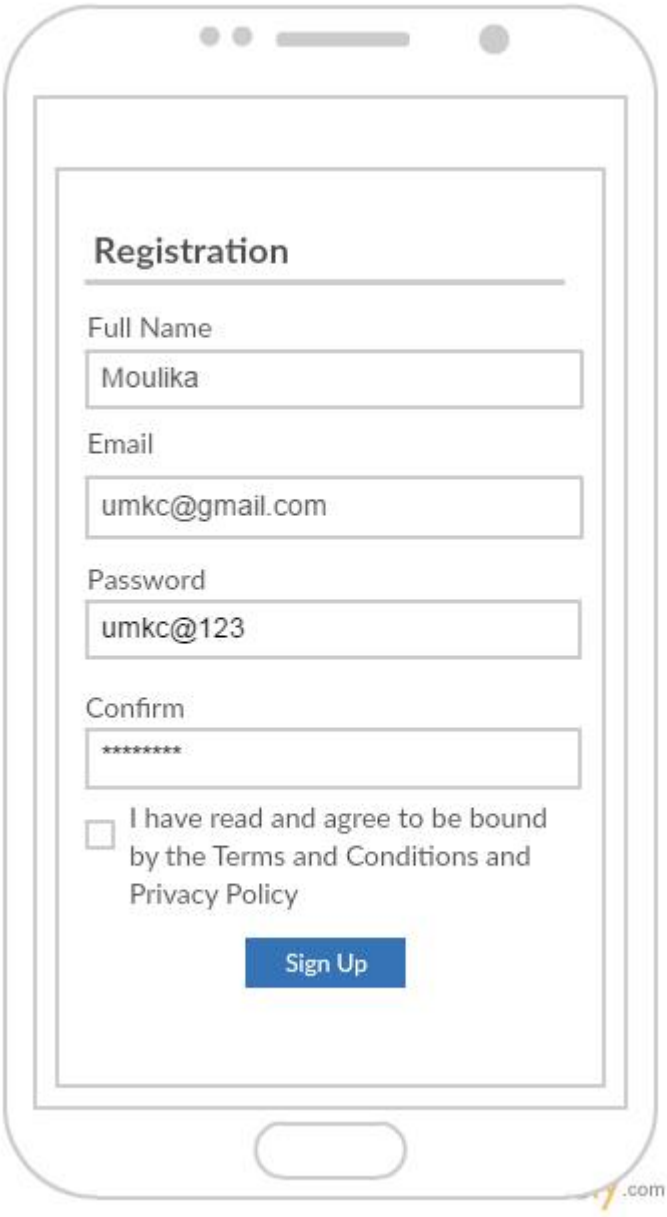
6. Detail Design of Features

6.1 Wireframes

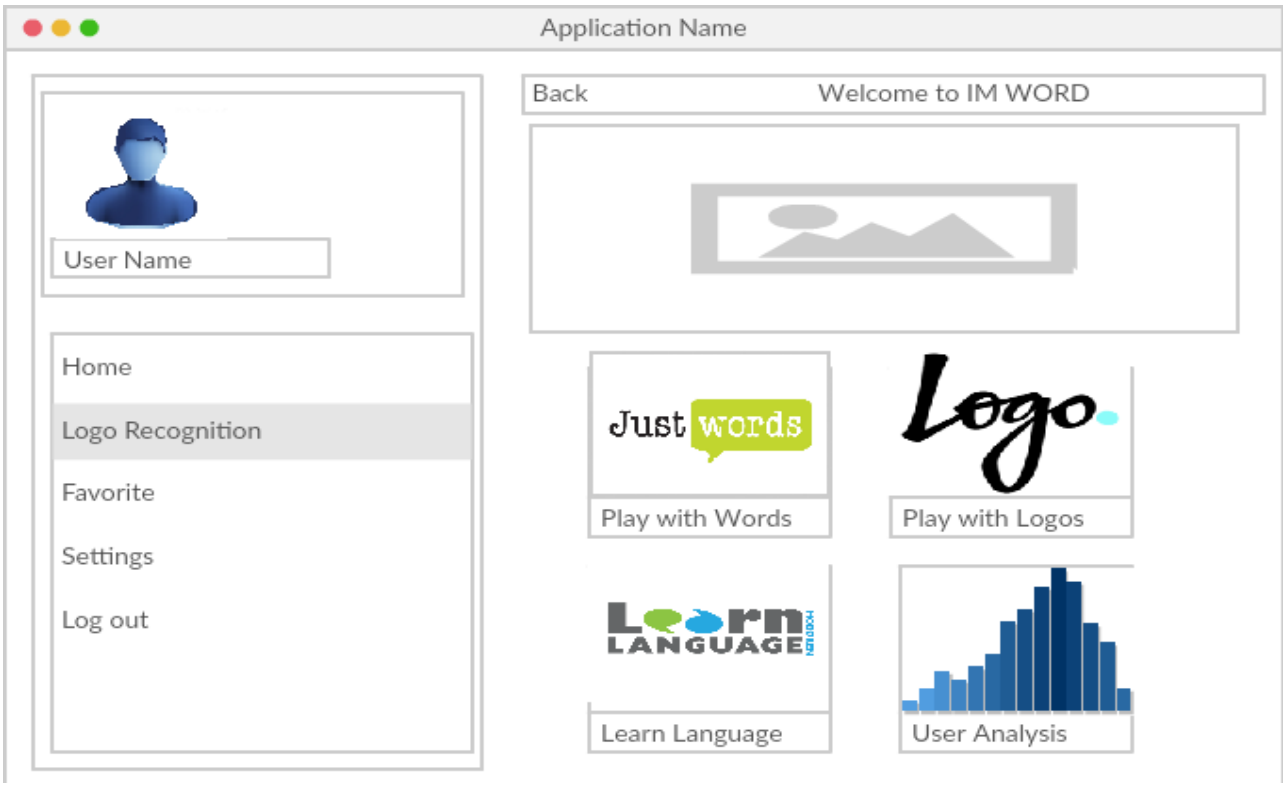
Login Page



Registration Page



Home Page



7. How to Use IM Word

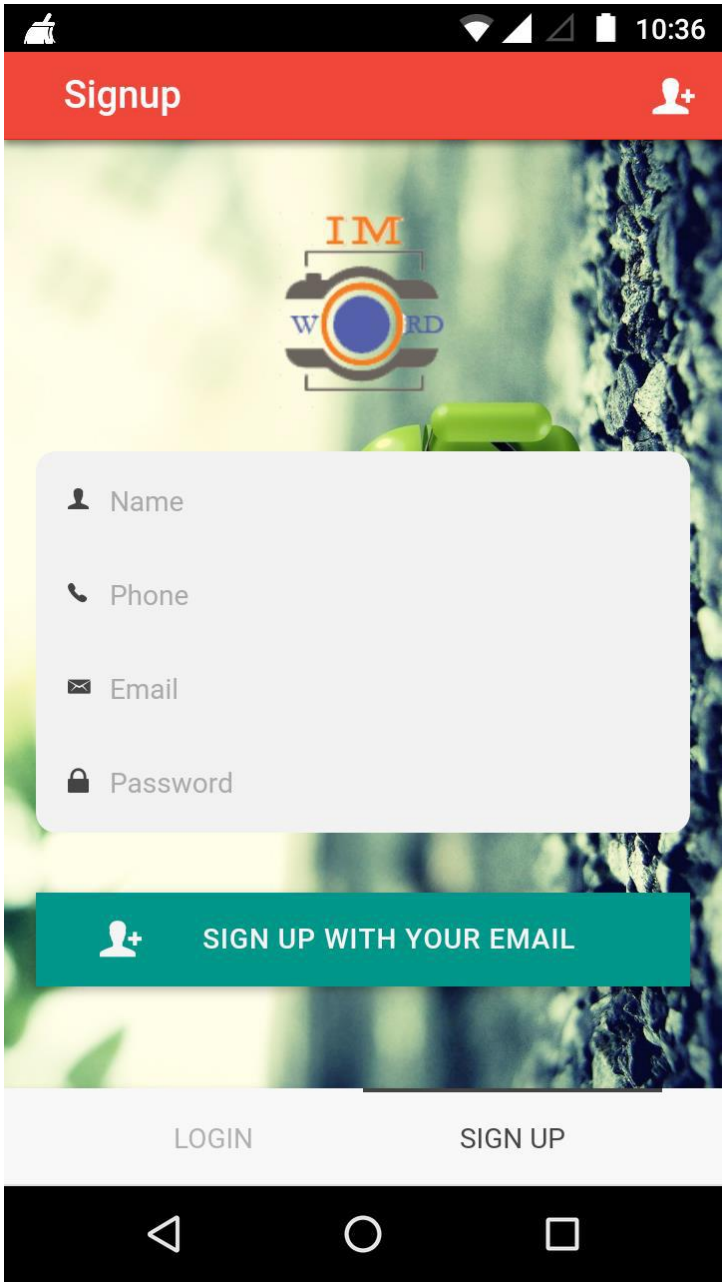
7.1 Registration Process

Initially new users should create account by giving Name, Phone Number, Email Id, Password. If user has not entered all the details validation will be thrown. Also, validation is thrown if the user entered invalid email id and password. If the user selected already registered email id, then validation will be thrown.

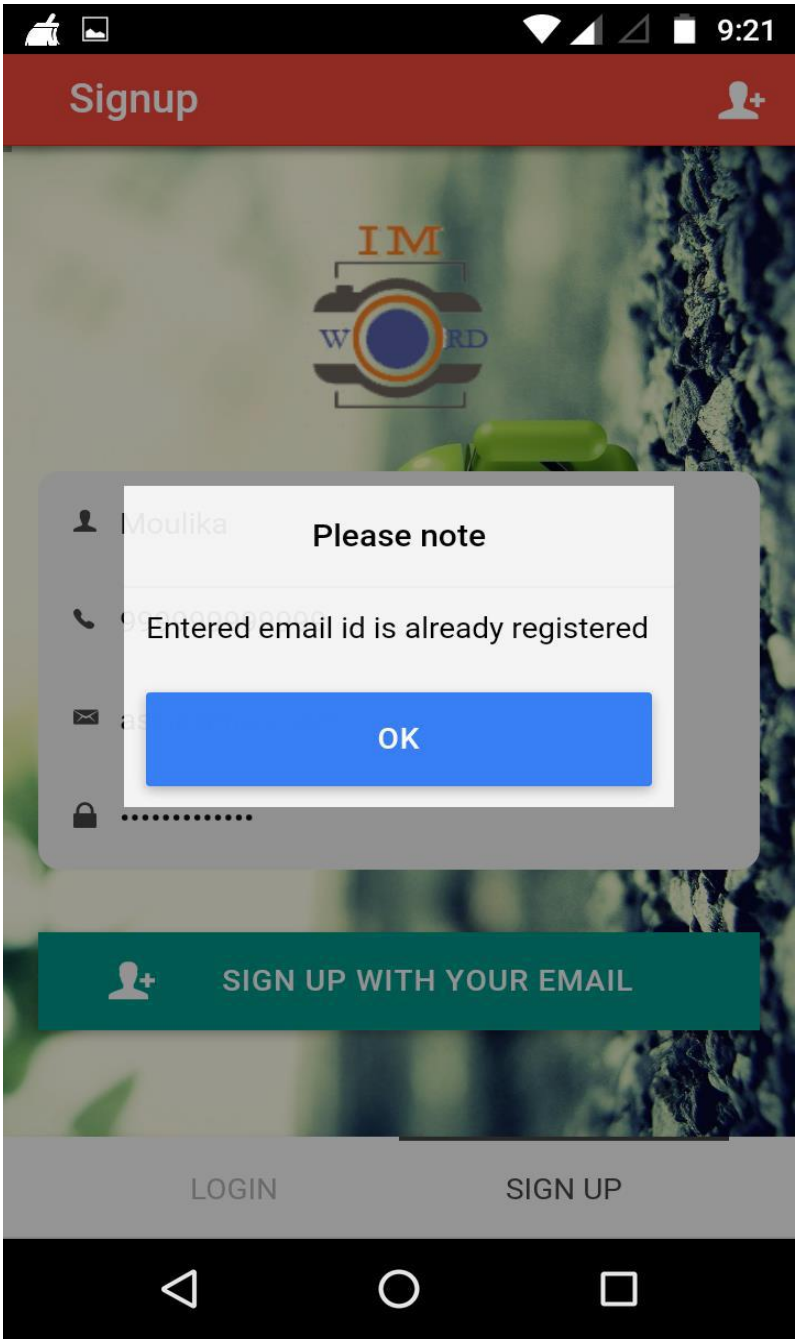
Registration Details Requirements:

- All the details are mandatory
- Phone Number should be only 10 digit numeric
- Email address should contain '@' and '.'
- Already registered email id should be used again
- Password should be minimum of 6 characters

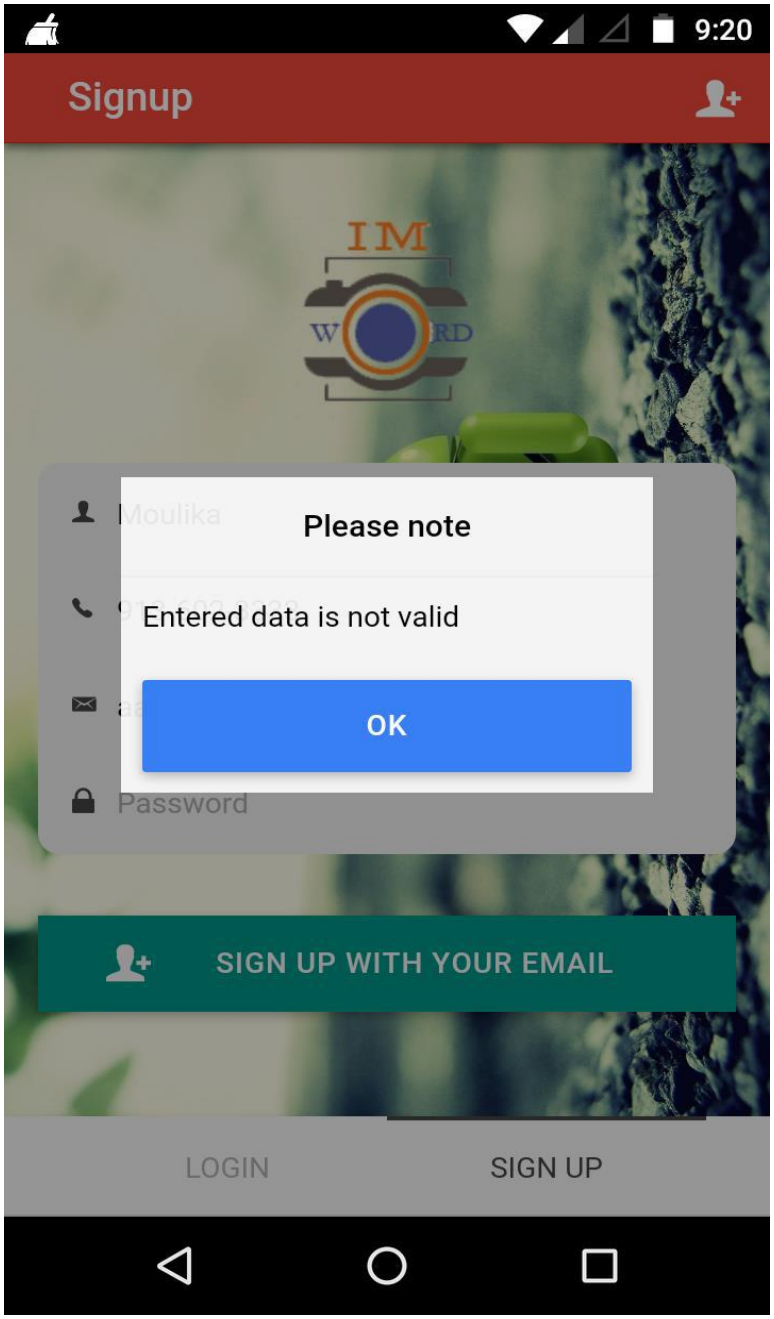
- Below is the Registration page where user must enter all valid details.



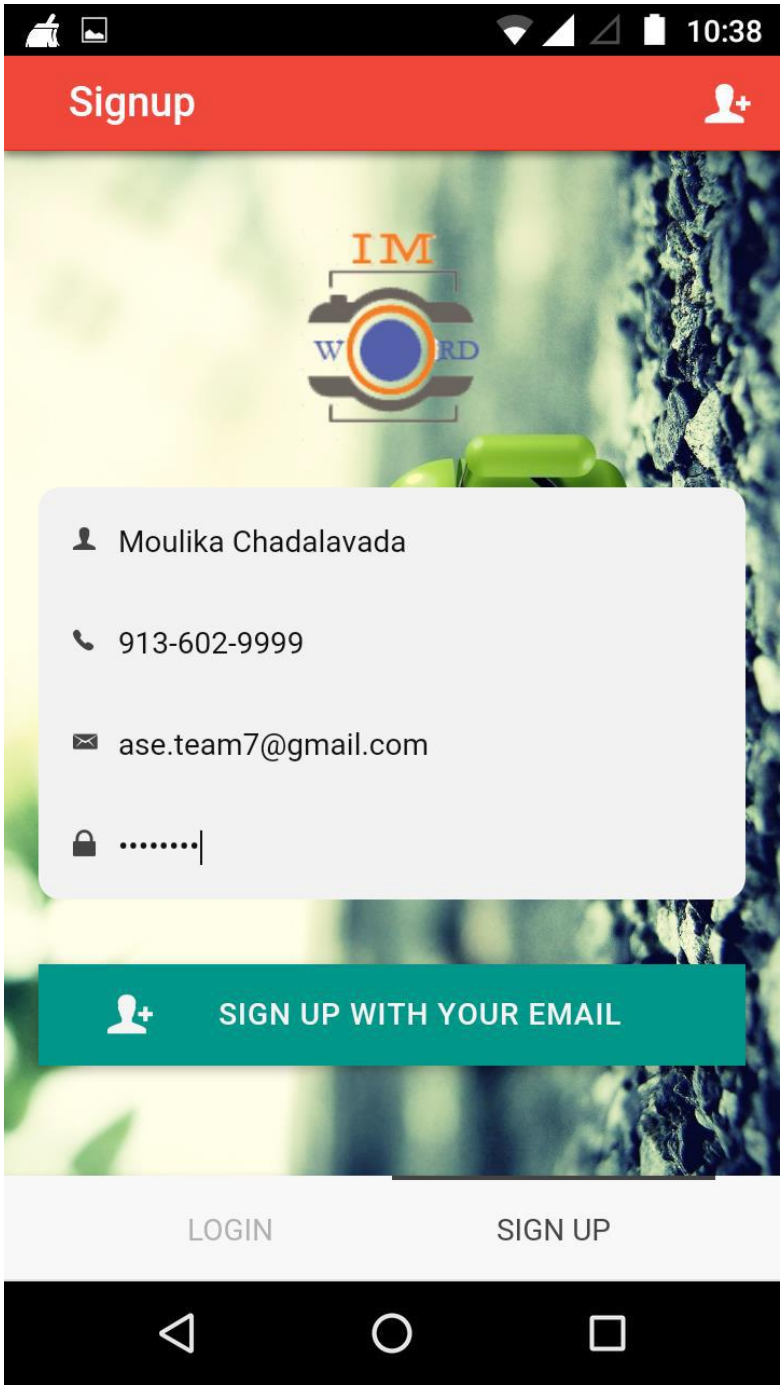
- Validation thrown if the user has entered already registered email id and password.

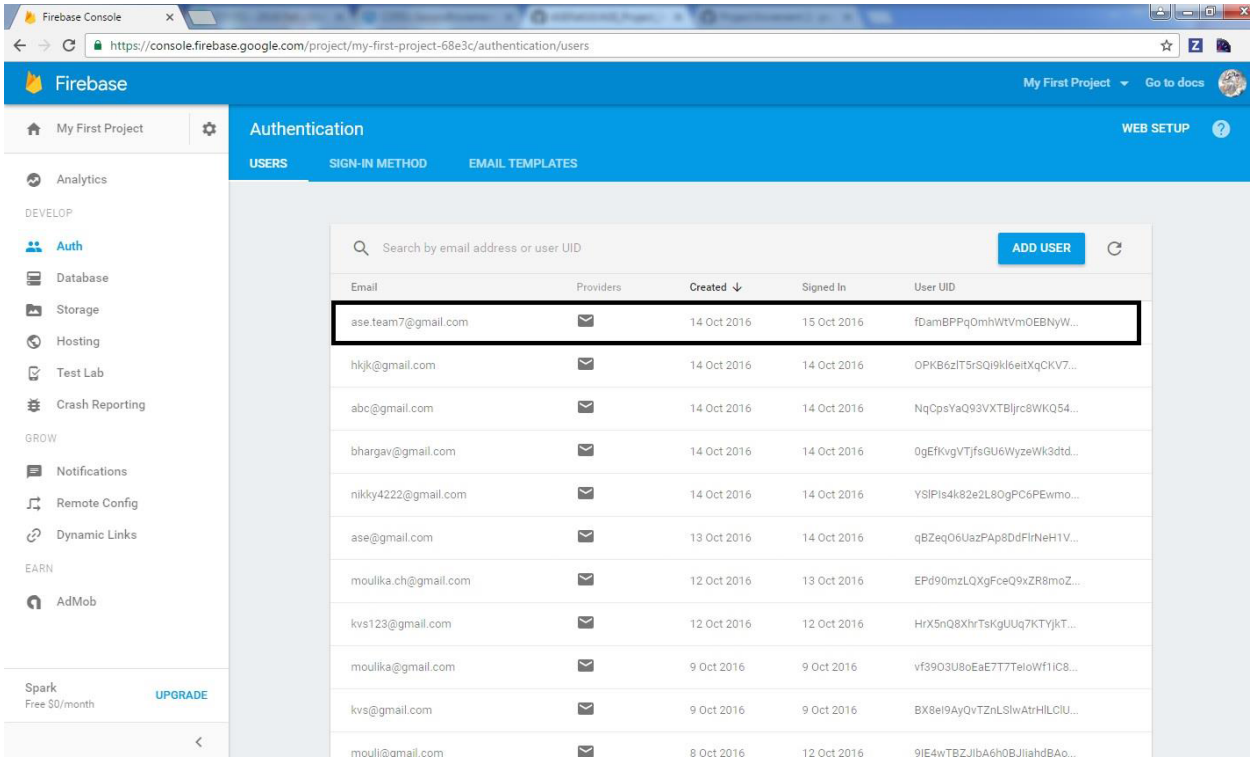


- Validation is thrown if invalid email id and password is entered.



- The user details entered during registration is stored in Firebase. The details are further used to validate user login.

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My First Project
Go to docs
My First Project
Authentication
WEB SETUP
USERS
SIGN-IN METHOD
EMAIL TEMPLATES
Analytics
DEVELOP
Auth
Database
Storage
Hosting
Test Lab
Crash Reporting
GROW
Notifications
Remote Config
Dynamic Links
EARN
AdMob
Spark
Free $0/month
UPGRADE
Search by email address or user UID
ADD USER
Email
Providers
Created
Signed In
User UID
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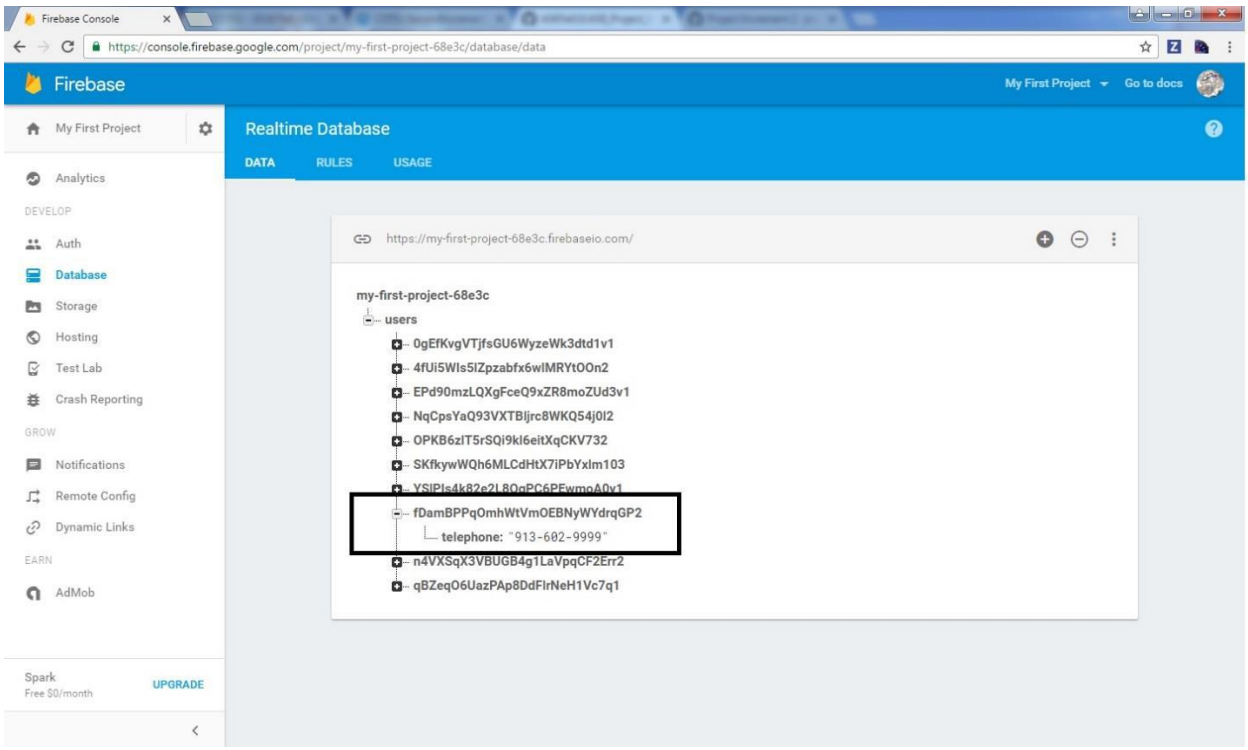
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Go to docs
My First Project
Realtime Database
DATA
RULES
USAGE
Analytics
DEVELOP
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Storage
Hosting
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Crash Reporting
GROW
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Remote Config
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EARN
AdMob
Spark
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UPGRADE
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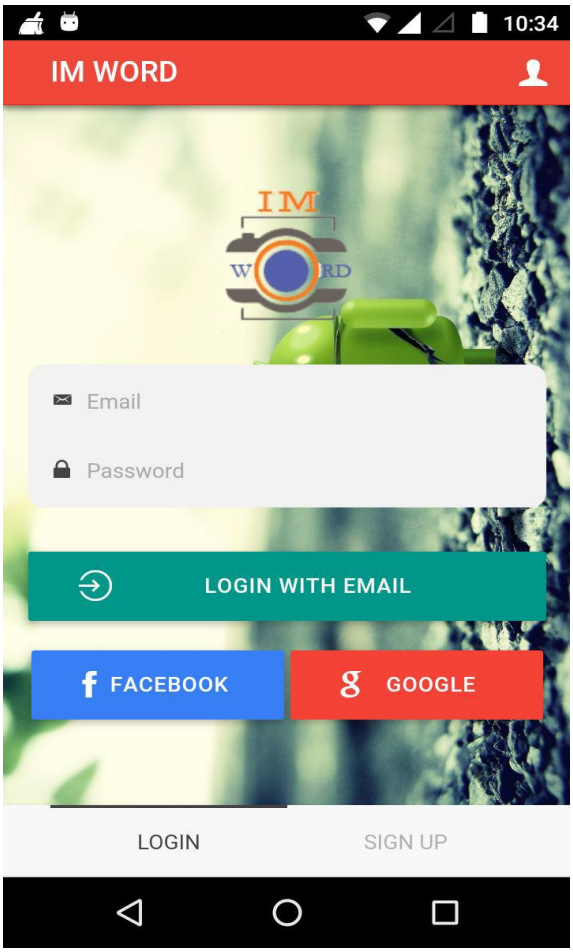
7.2 Login Process

Once the new user is created successfully, login to the application through login page.

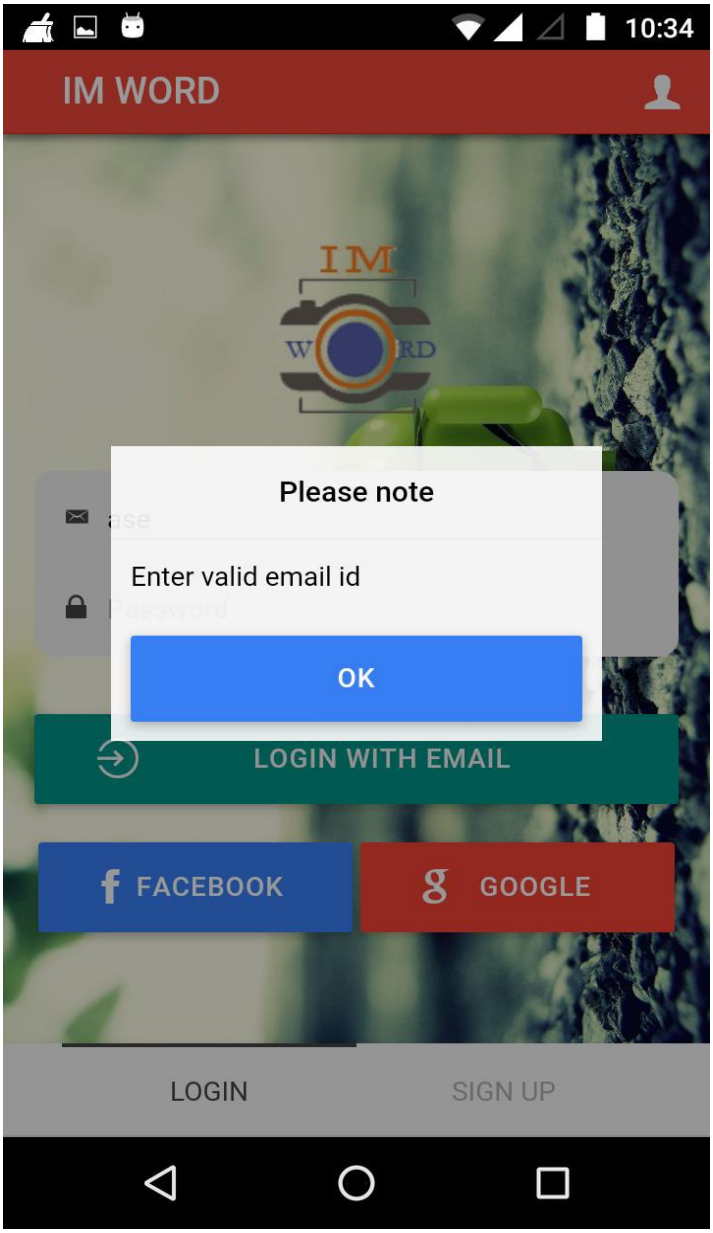
Login Page Requirements:

- All the details are mandatory
- Only the registered user email address is valid (Details stored in Firebase)
- Email address should contain '@' and '.'
- Password should be same as password entered during registration
- User can also login through Facebook or Google

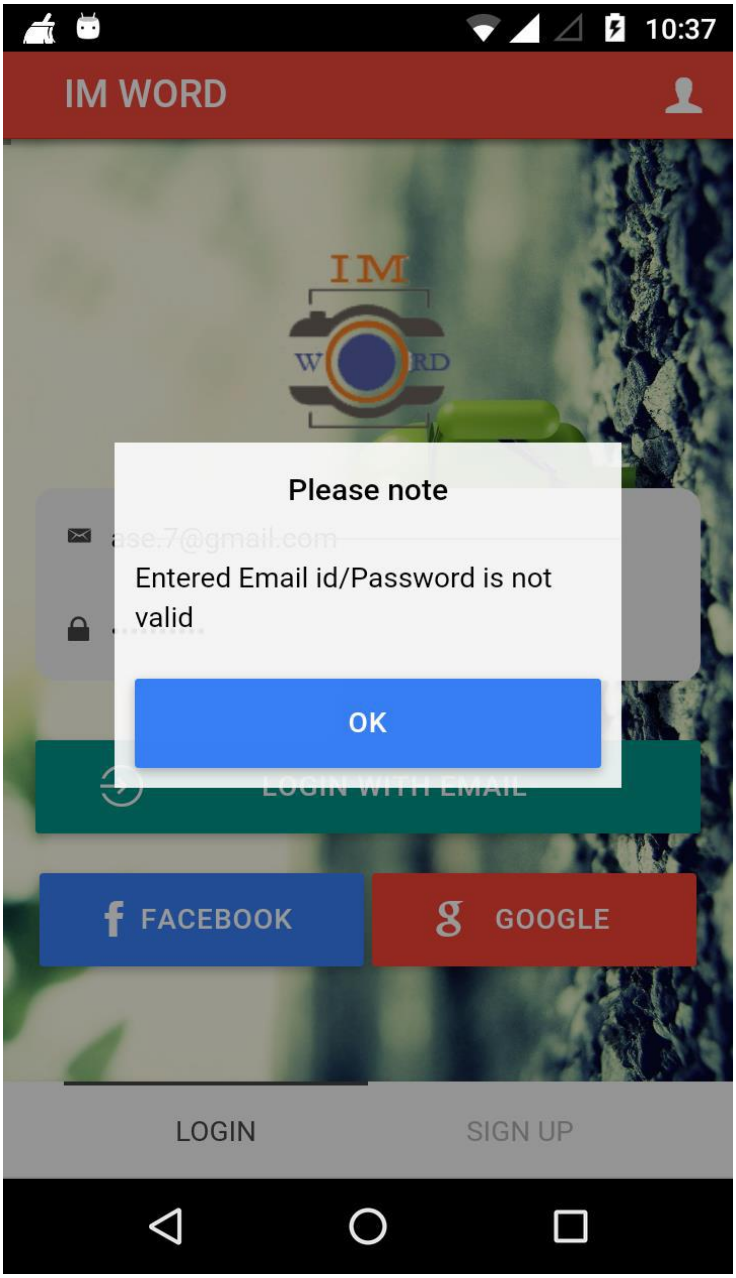
- The below is the Login page where user can to login using valid email id and password or through Facebook or Google.



- Validation thrown when invalid email id is thrown. (‘@,.’ Is not present)



- Validation is thrown if entered email id and password is not present in Firebase. (i.e. not registered email address)

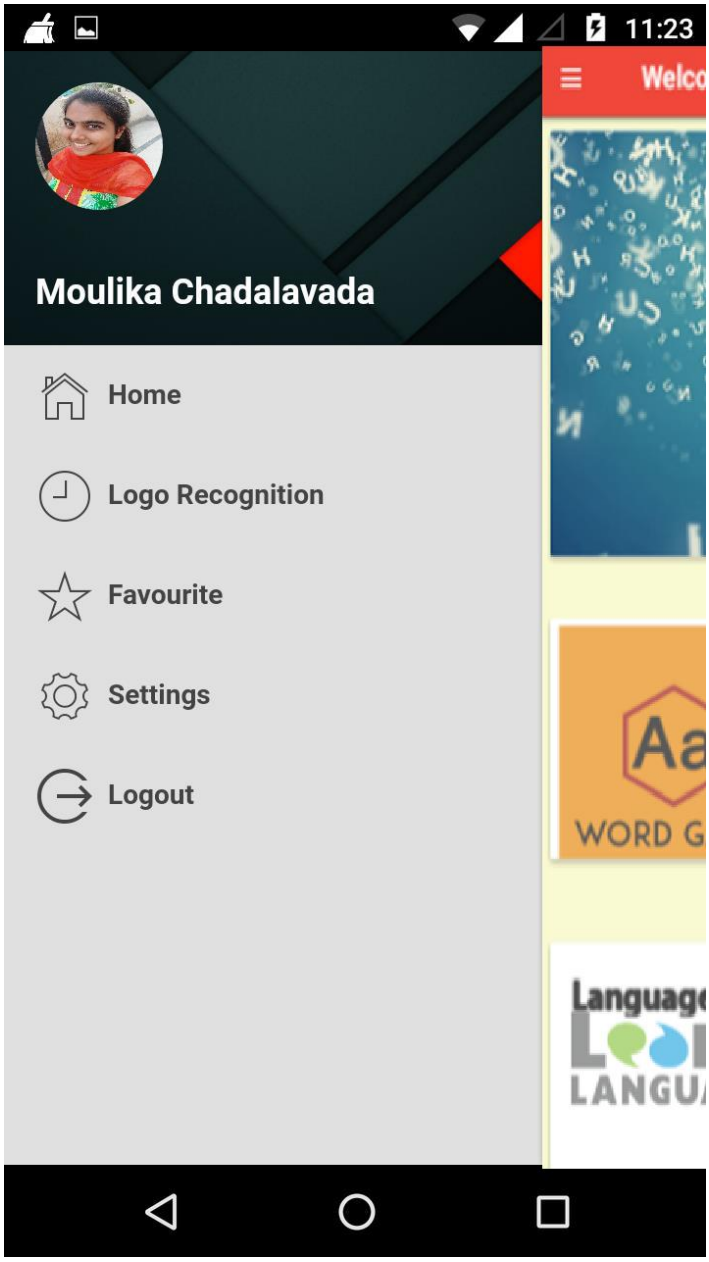


7.3 Start the Game

Once the user logs in successfully, the below home page is displayed where user can play with words, logos, and Learn Language. If the user clicks on any of the icon another page is redirected where user has two sections Kids Zone and Adult Zone.

- Below is the home screen where user has various options like Play with words, logos, know user analysis.

- The side menu in the home screen helps the user to navigate easily.



- Once the user clicks on Word Game two sections are available to user, one is Kids Zone and the other is Adult Zone.

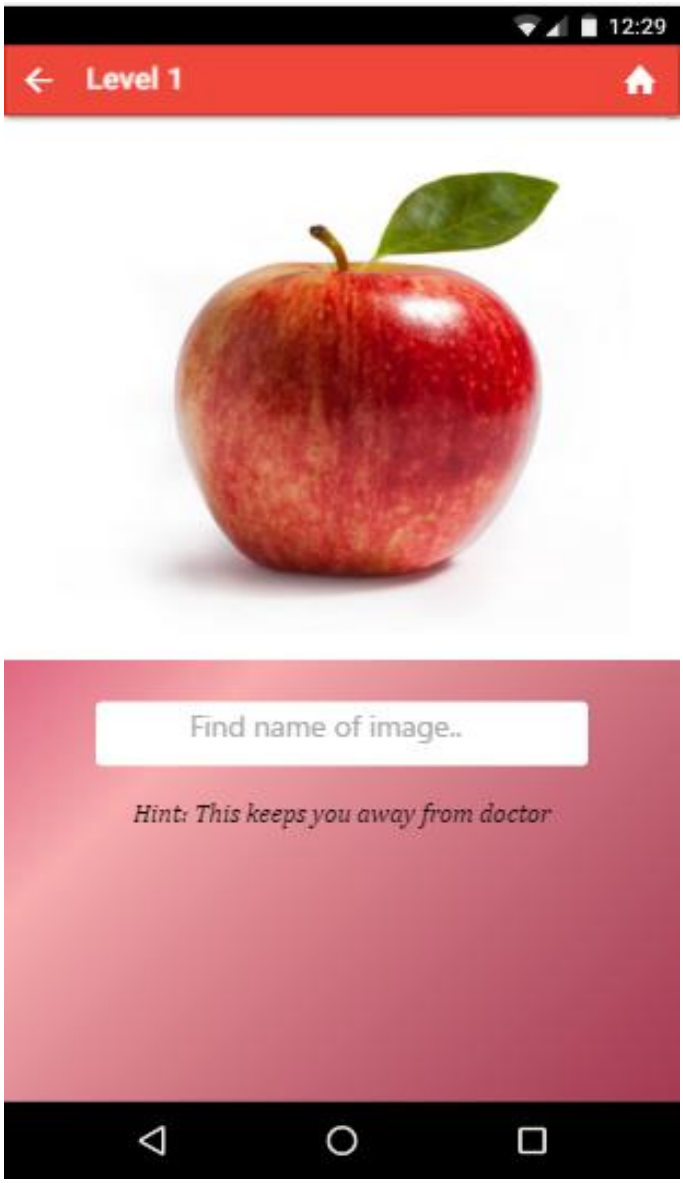
7.4 Word Game

Once the user selects Kids/Adult zone the user will be directed to levels page where the game is divided into various levels and each level containing different questions. Once the level is completed user is redirected to next level. The user level status and the time in which level is completed is tracked in Mongo DB. So if the user logs out and login then we can directly start from new question which he left before last login.

- Below is the image displaying different levels of the application.

Once the user clicks on each level image will be automatically populated on the screen. This images are stored in Mongo DB. Along with image the correct answer,wiki link is also stored in Mongo DB. The difficulty level of Adult Zone will be more than Kids Zone. Also difficulty level increases from one level to other level.

- Below is the sample question that is displayed to user on clicking on Level.

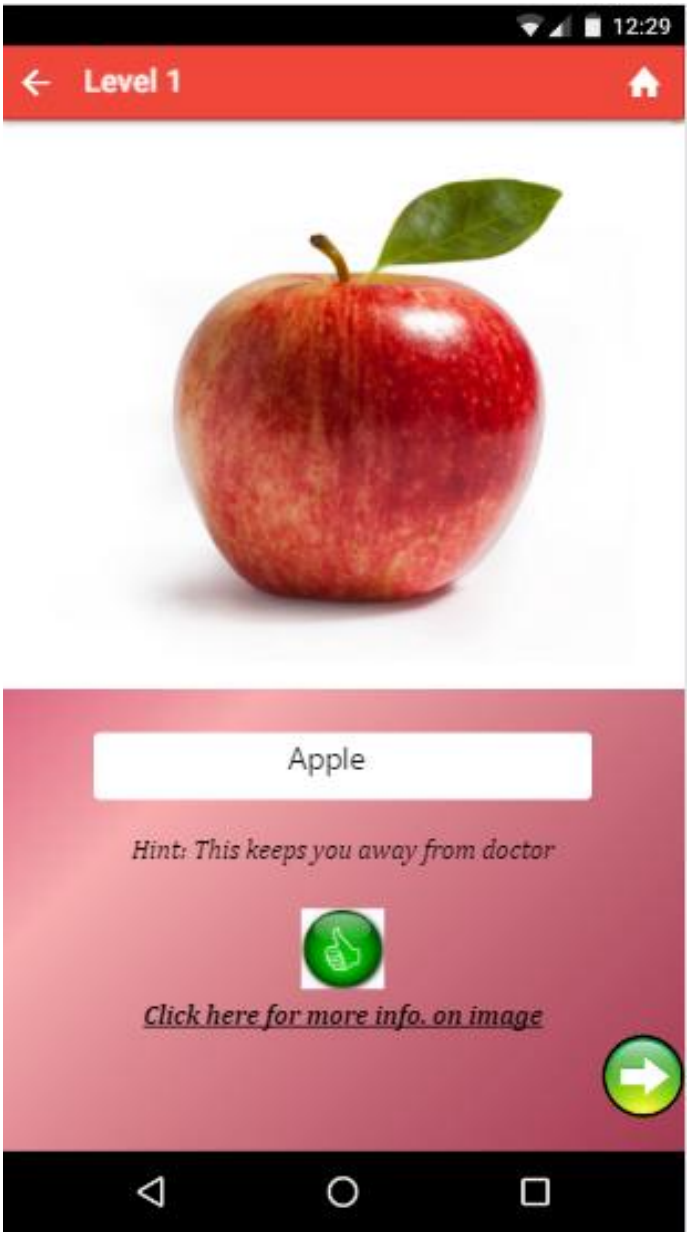


The user has to enter correct answer in the provided text box. If the answer is wrong, then incorrect icon is displayed and the user will not be allowed to moved to next question and he/she can give

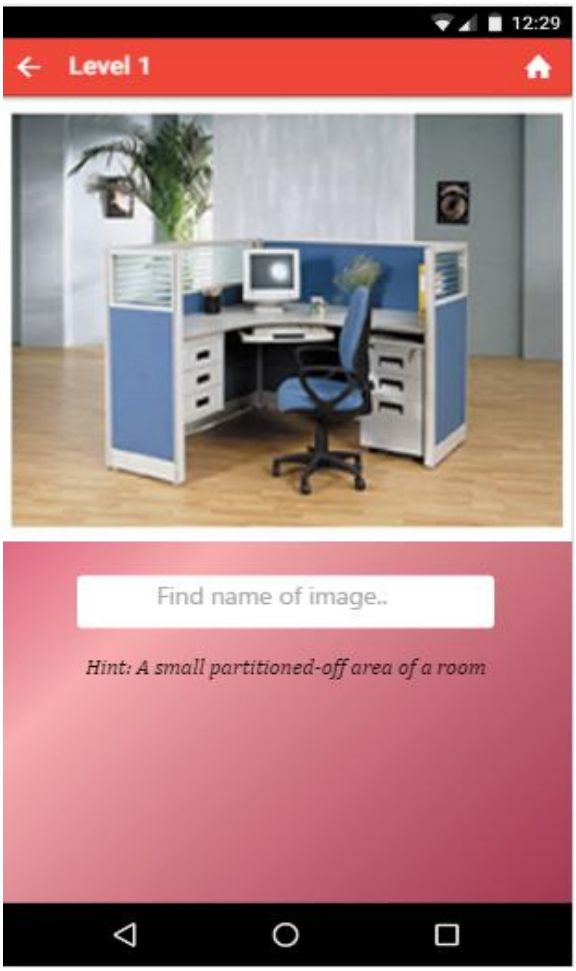
another attempt. If the user correctly guesses the word, he/she gets a link using which the user can additional information about the image with a up thumb icon means correct. Also user is allowe to move to next question.

- In the below image used entered wrong answer i.e. Mango instead of Apple so alert is shown to user.

- In the below image used entered correct answer Apple so correct alert is shown to user and the pronounciation of the word is given to user. Along with that wiki link of respective image is displayed to user. He is allowed to move to next question also.



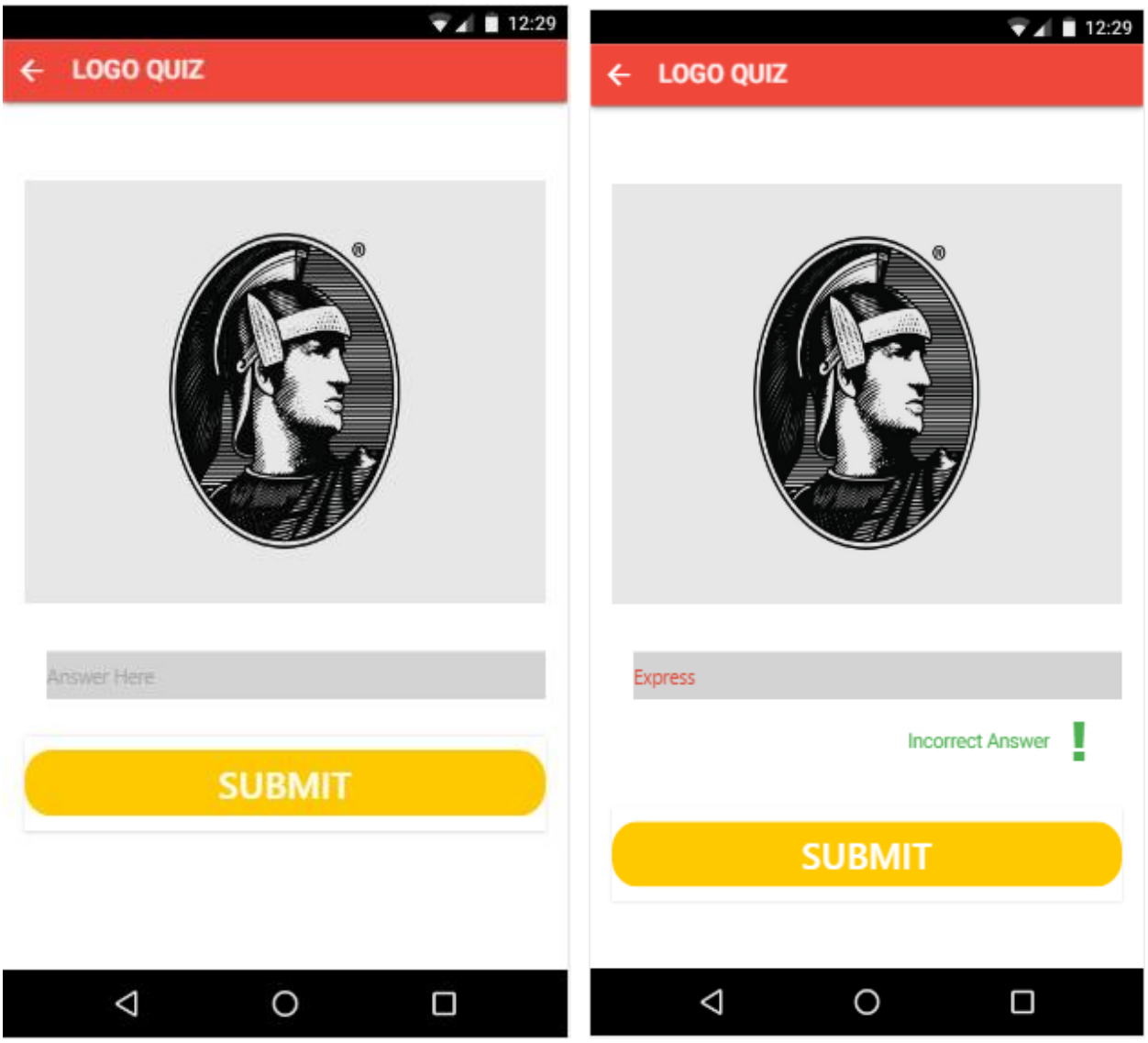
- Below are the series of few sample images that are displayed in word building game on clicking next button.



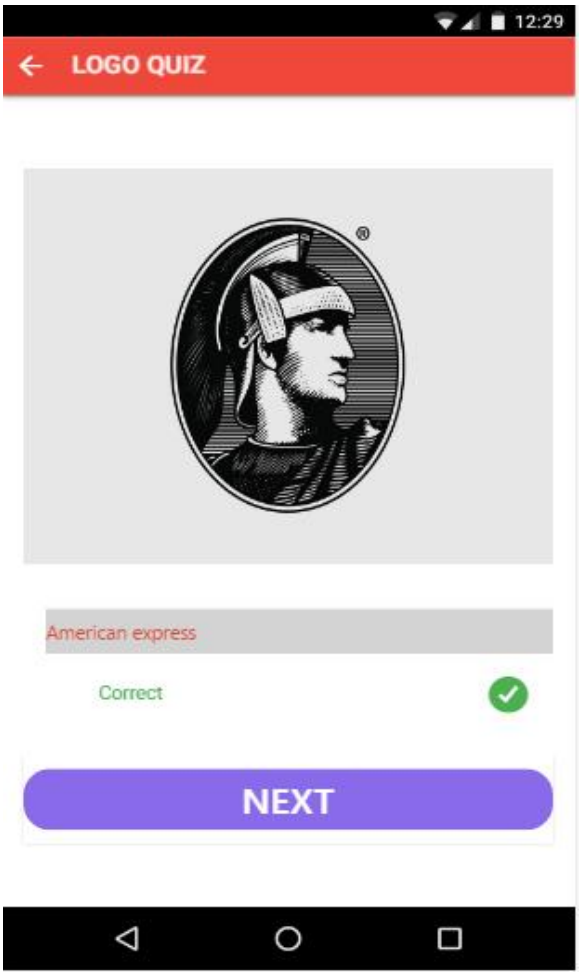
7.5 Logo Game

User can play with the logos also. After the user selects Play with logos option he/she will be directed to the LOGO QUIZ page where series of logos are displayed. As shown below the user is displayed with the image and the user has to correctly guess the logo correctly. IF the answer is correct, option will be provided to got the next logo. If the answer is wrong the user can guess the logo again.

- Below is the sample logo quiz question displayed to user on clicking play with Logos. Where user enters wrong answer and alert message is displayed.



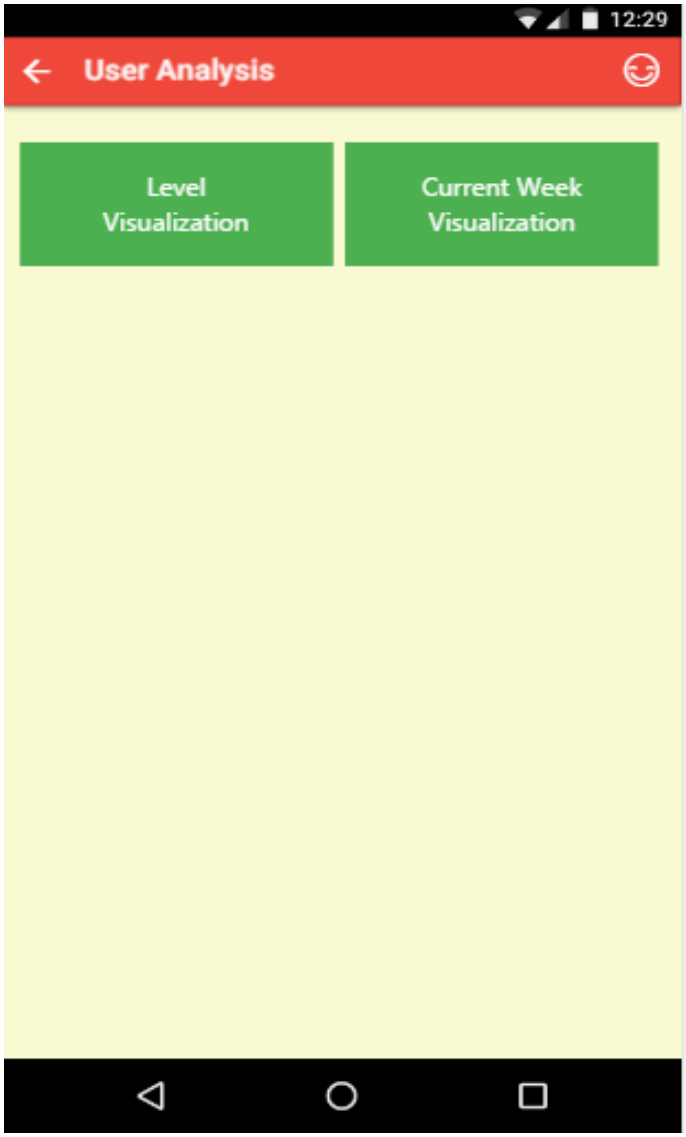
- Below is the image where user enetered correct answer and he/she is allowed to move to next question.



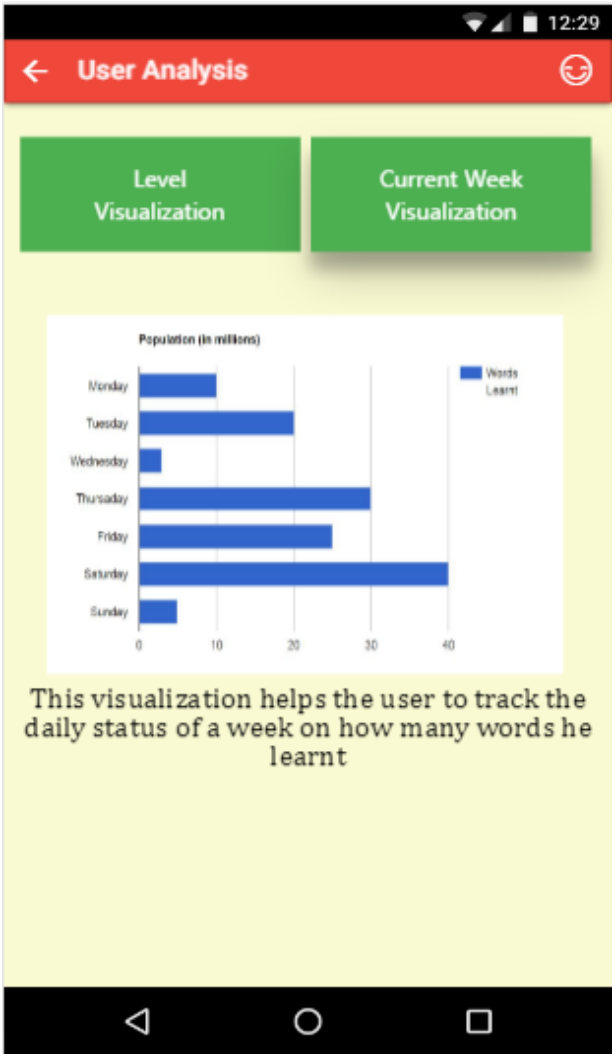
7.6 User Analysis

This section helps the user to compare himself between various levels. When the user is playing game the time taken to complete each question is tracked and stored in Mongo DB for each user. Also the number of words he/she learnt in a week is also tracked daily. From this user visualization is performed on two criteria basis. One is level wise visualization where user will be given how time user took to solve each question under each level and Week wise visualization where user can know how many he/she learnt on daily basis.

- Below image shows the two buttons one for level wise visualization and other for week wise visualization.

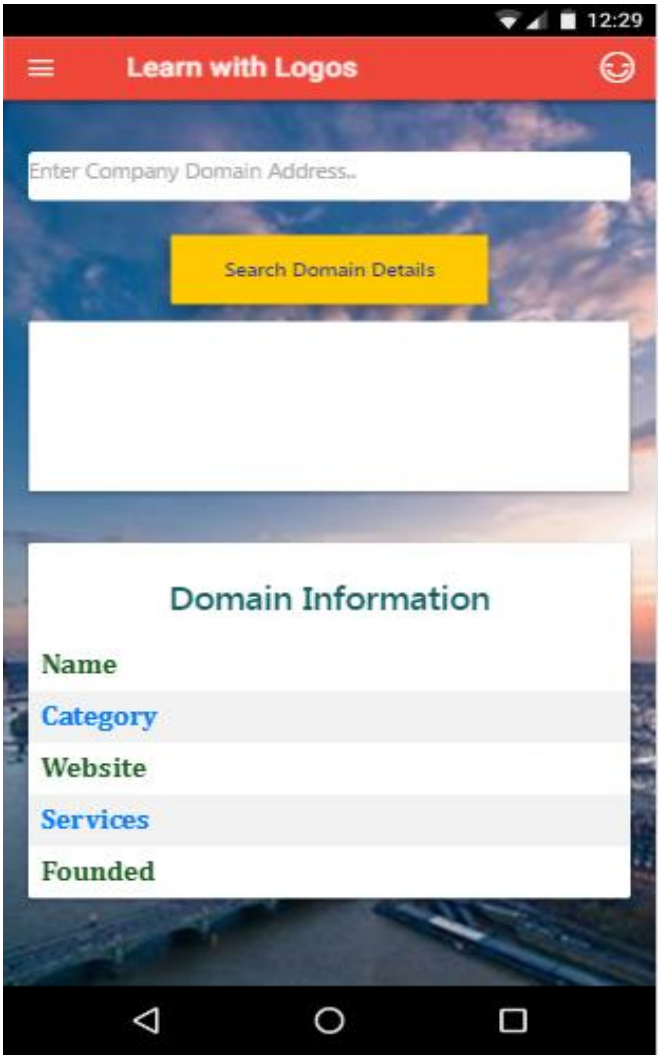


- On clicking level visualization below visualization is displayed to user. On clicking Current Week visualization below visualization is displayed to user.



7.7 Learn About Logos

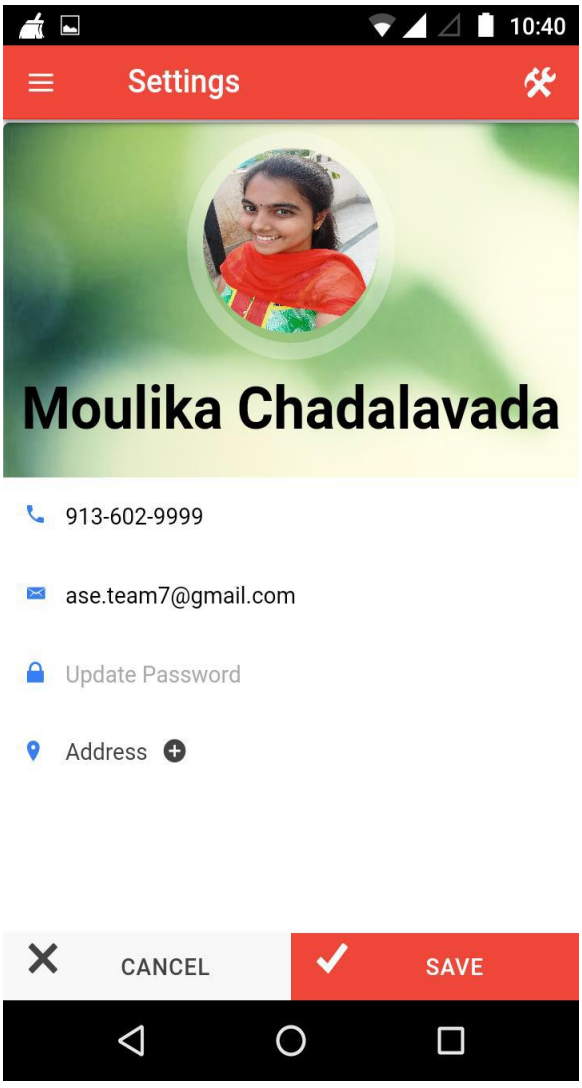
- In the side-menu when the user clicks on Logo Recognition he/she will be redirected to below page.

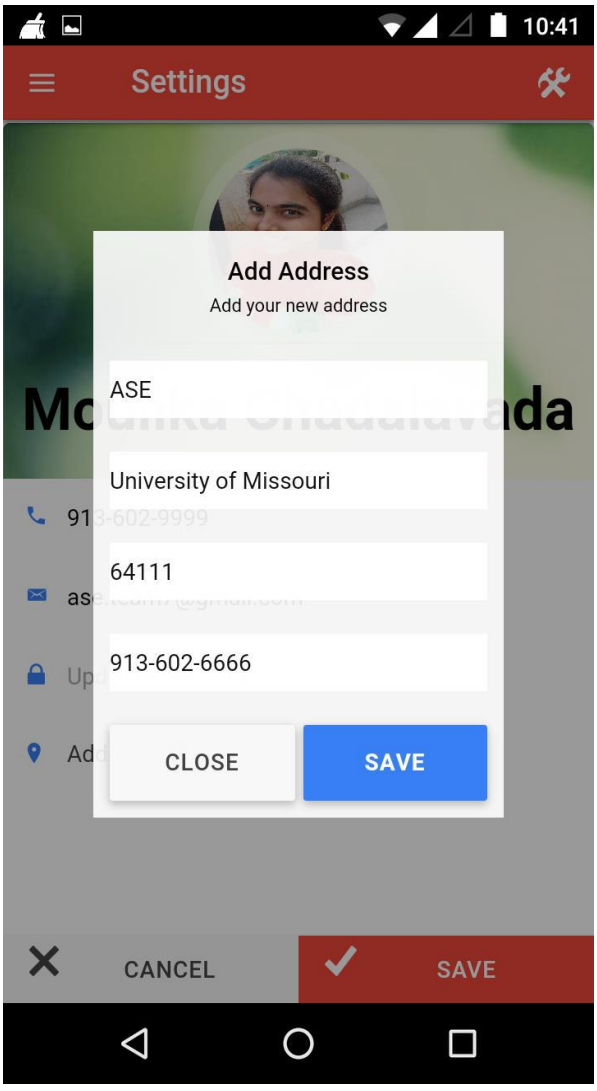


- In the provided text box user can enter any of the companies domain name and has to click on Search Domain Details. Then the logo for respective domain name and all the corresponding details are displayed to users. In the below image user entered umkc.edu so the logo of UMKC and its respective details is displayed in the screen.

7.8 User Profile Management

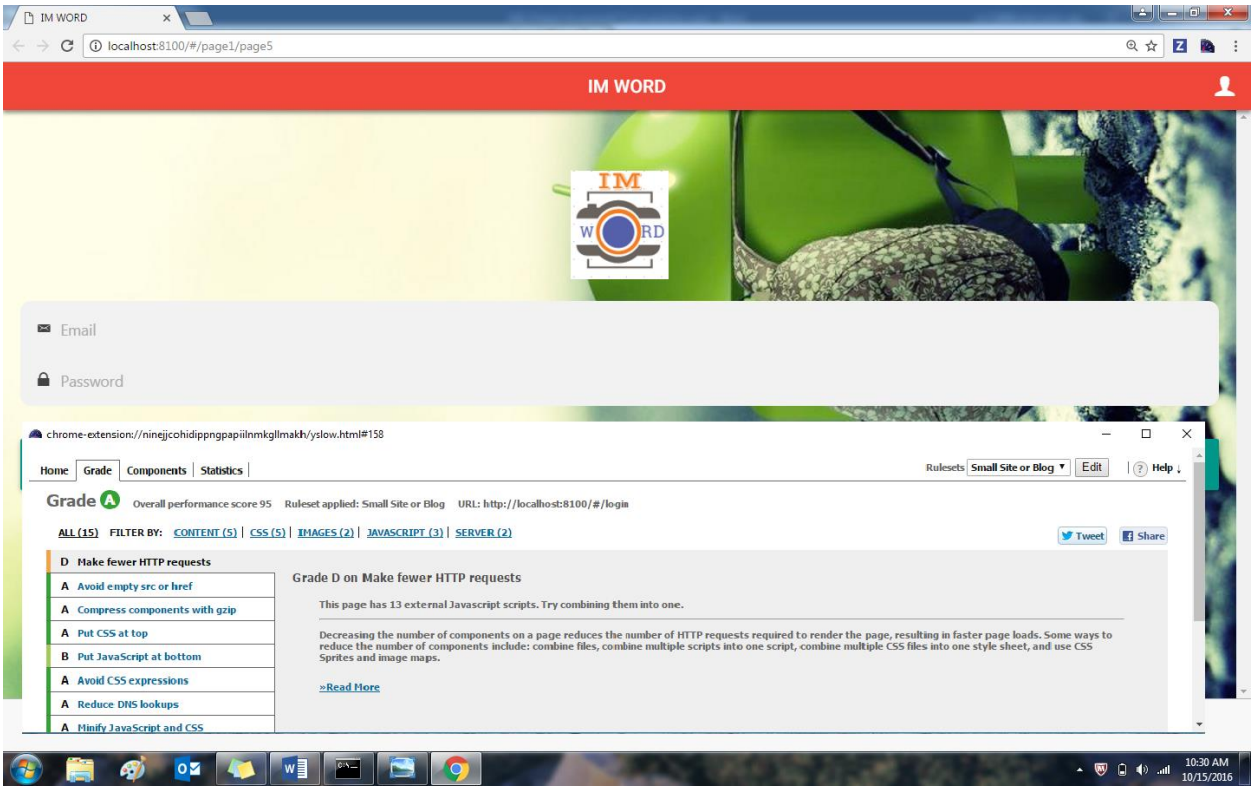
In the side-menu user has option called Settings. If the user clicks on Settings button below screen will be displayed. Details such as Mobile number, email address and address details are fetched from Firebase and are displayed on settings screen where user can update all these details. Here user can update mobile number, change password and manage address details.





8. Testing

- Page performance and ranking is checked using YSLOW analyzer



Test Case No.	Test Case Name	Pre Conditions	Expected Output	Sample Input	Status
1	Login with null values	If user has not entered email id and password	Validation will be thrown to user to enter mandatory details	Email id : null Password: null	Pass
2	Login with invalid email id	If user has entered email id without '@' and '.' symbol	Validation will be thrown to user	Email id : moulika	Pass
3	Login with credentials that are not in firebase	If user entered email id that is not in Firebase	Validation will be thrown to user to enter valid email id	Email id : mm@gmail.com Password: mmmmmmm	Pass
4	Valid credential in Login page	If user has entered valid email id and password that is there in firebase	Successfully redirected to home page	Email id : mouli@gmail.com Password: moulika1992	Pass
5	Registration with null values	If user tries to Sign with null values	Validation will be thrown to user to enter mandatory details	Name : null Email id : null Password: null	Pass
6	Registration with invalid email id	If user has entered email id without '@' and '.' symbol	Validation will be thrown to user to enter valid email id	Email id : moulika	Pass
7	Registartion with already registered user	If user entered email id that is already registered in Firebase	Validation will be thrown to select another email id	Email id : moulika.ch@gmail.com (Already registered email)	Pass
8	Registration with all valid details	If user entered all valid details such as Name,Email id,Password	Successfully redirected to login page from where user has to login	Name : Moulika Email id : mouli.c25@gmail.com Password: moulika123456	Pass
9	Displaying images from Firebase	When user successfully logged in	Then in home page the user should be able to start game with image that is loaded from Firebase		Pass

9. Related Information

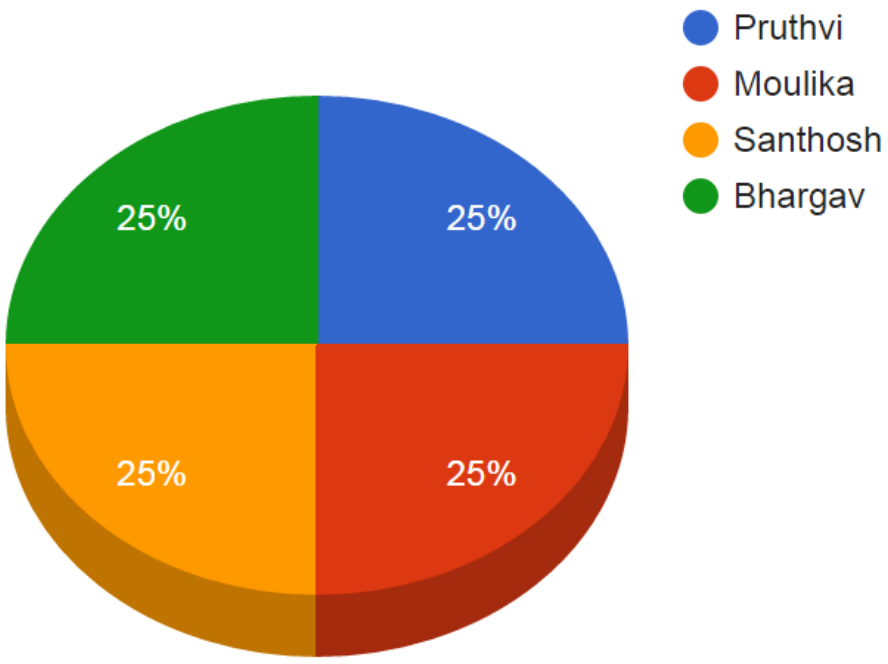
GITHUB	https://github.com/pruthvi6767/ASEFall16/tree/master/Project
FIRST INCREMENT REPORT	https://github.com/pruthvi6767/ASEFall16/blob/master/Project/Increment_1/Documentation/ASEProjectPlanIncrement-1.pdf
SECOND INCREMENT REPORT	https://github.com/pruthvi6767/ASEFall16/blob/master/Project/Increment_2/Documentation/ASE_Project_Increment2.pdf
THIRD INCREMENT REPORT	https://github.com/pruthvi6767/ASEFall16/blob/master/Project/Increment_3/Documentation/ASEProjectPlanIncrement-3.pdf
FOURTH INCREMENT REPORT	https://github.com/pruthvi6767/ASEFall16/blob/master/Project/Increment_4/Documentation/ASE_Team7_Increment_4.pdf
PRESENTATION	https://www.dropbox.com/s/sl5nubwci5u26se/ASE-IM-WORD-Presentation-Team-7.pptx?dl=0
YOUTUBE	https://youtu.be/YTaomnuRkp0

10. Project Management

10.1 Team Members Contribution

S.NO	Team Member Name	Task Assigned	Status
1	Pruthvi Raj Reddy Chukkanagari	Logo Gaming Logo Recognition Logic Implementation to upload images in Mongo DB UI for respective pages Testing for respective modules Documentation	Completed
2	Moulika Chadalavada	Word Gaming Logic for Kids & Adult Zone Tracking User Scored in Mongo DB Text to Speech API Implementation	Completed

		Settings Page to manage user profile information UI for respective pages Testing for respective modules Documentation	
3	Santhosh Kumar Gattu	Cordova Oauth Levels Maintaining in Mongo DB UI for respective pages Testing for respective modules Documentation	Completed
4	Bhargav Krishna Velagapudi	User Login & Registration in Firebase Graph Visualization using Google charts UI for respective pages Testing for respective modules Documentation	Completed



10.2 Final Project Evaluation

The project IM Word is successfully completed in the scheduled plan (as shown on Project Plan). We had good interaction with each other and always maintained one to one communication to maintain same understanding of entire project. Following Agile process model helped us to add few changes in the middle of project without facing any major milestone. Agile Process requires less documentation and more interactive between team members.

The work is equally divided between the team members so that we could able to meet the prescribed timelines without any delay. The management structure of entire team is described in Section 9.1. Testing each and every module efficiently helped us to reduce the errors during final integration of the project. Because of this we could reach all the goals and developed the project as proposed in the Project Proposal.

The success of every project involves in good collaboration with team members, maintaining quality of project, having good understanding of requirements, testing of every module efficiently, identifying blockers early and trying to solve them immediately.

11. Future Work

- Scanning any image or logo to get more information about it
- Using crowd analytics analyzing user emotions

12. Bibliography

http://stackoverflow.com/

http://grepicture.wordpress.com/2009/01/22/a-list-1-10/

http://ionicframework.com/

http://ngcordova.com/docs/plugins/