

Design Log

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App Idea and Features Discussion

Dates: Started 02/01/18 and finished 02/07/18 Estimated time: 2 hours

Summary: Various app ideas were initially discussed. Merits, risks and development time were all considered during the brainstorming of ideas. Examples of initial ideas that did not make the cut include:

- Tourism app due to google map API complications
- An app to help people with disability due to accessibility complications

The finalised app proposal was this:

Budgeting app target at students and possibly other users.

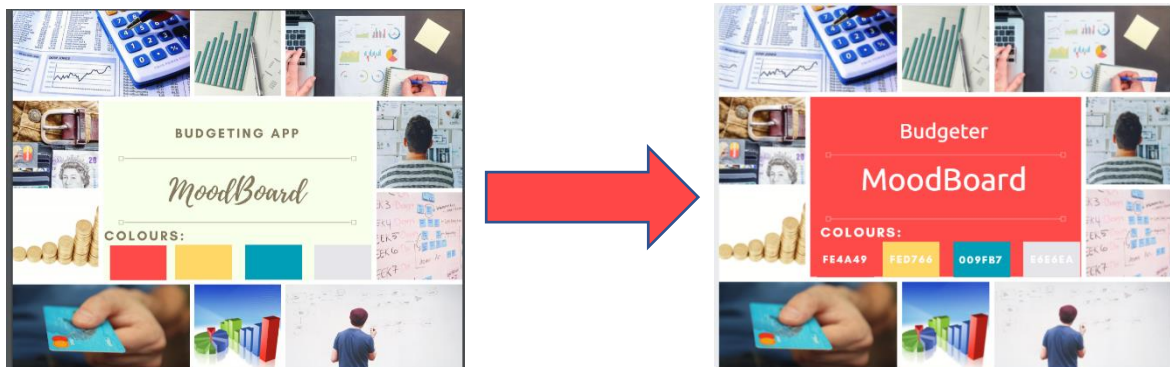
Potential Features:

- Home page summary
- Record transactions via home
- Helpful articles and posts
- Daily, weekly and monthly breakdowns
- Helpful tips based on spending data
- Helpful notifications based on spending data
- Log in system to back up
- helpful contacts

Moodboard Drafting

Dates: Started 02/08/18 and finished 02/20/18 Estimated time: 2 hours

Summary: Various moodboard templates from the website Canva were considered (e.g. “The Fall is Here” initially), but the final version stuck with “Sue’s Makeover Fest” template. Changes between drafts were minor and included changes to fonts and colours to fit other documents:



Fontboard Drafting

Dates: Started 02/08/18 and finished 02/23/18 Estimated time: 2 hours

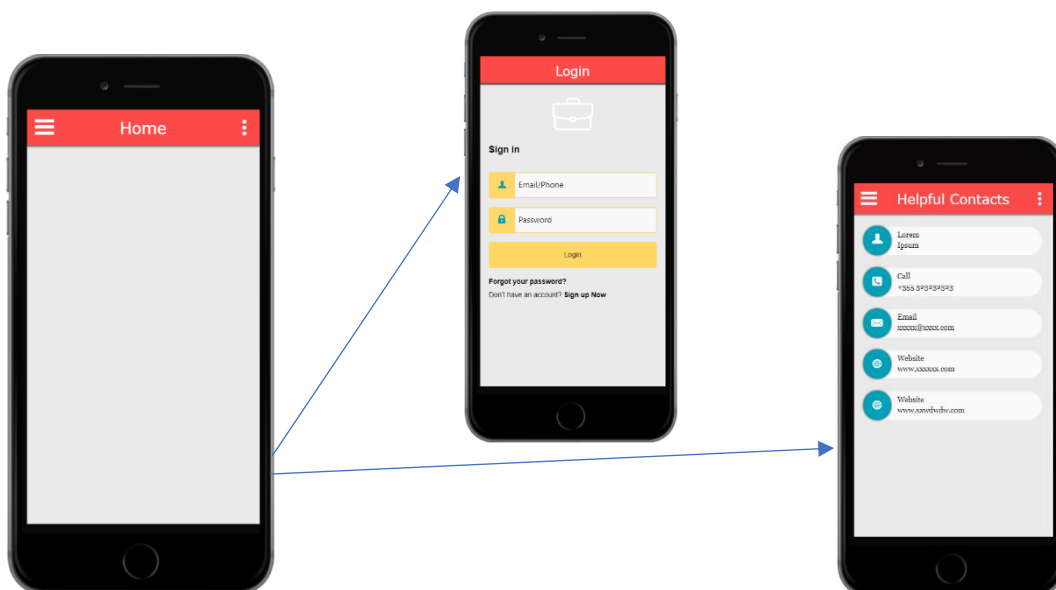
Summary: Initial drafts were like the drafts used in the Internet Technology module with simple colours, basic rectangular shape and various characters. Later drafts were modified to include navigation and more buttons to look more like template for a mobile app.



Mock-up Design

Dates: Started 02/15/18 and finished 02/23/18 Estimated time: 2.35 hours

Summary: Various colours were initially considered, but the greyish white background and red colours from the moodboard fit best. The basic template mock was first design, then more detailed mock-ups were derived from it.



Business Case Drafting

Dates: Started 02/15/18 and finished 02/20/18 Estimated time: 3.35 hours

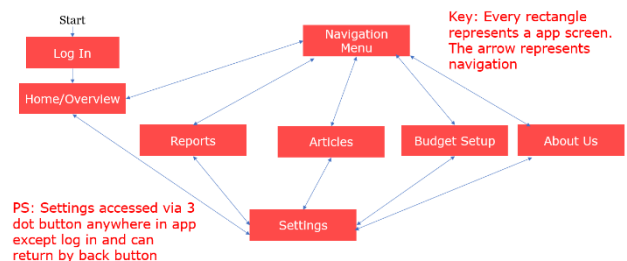
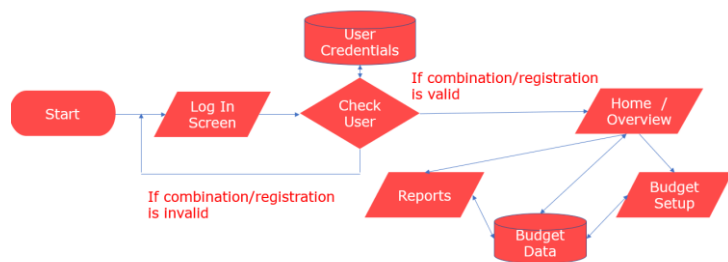
Summary: A Business Case document was first created and designed using similar layouts as the other documents. The Business case consisted of:

- Problem introduction: Why budget?
- Competition solutions: Competing apps like SimpleBudget.
- My solution: How to solve problem better than competition while taking lessons from their shortcomings.
- Other risks and market analysis

Basic Storyboard Drafting

Dates: Started 02/20/18 and finished 02/23/18 Estimated time: 3.5

Summary: A storyboard document – again using the same layout as other documents – was created and populated with mocks, navigation maps and charts. However, the initial draft seemed to lack descriptions of touch interaction which needs to be added later.



User Stories and Personas Outlines and Drafts

Dates: Started 02/23/18 and finished 02/23/18 Estimated time: 1.2 hours

Summary: Basic user stories that can be expanded and added to were created and the basic outline for the Personas was envisioned.

Name 1

- As a user of Budgeter, I want to be able to setup various income sources, so that I can compare my income to my spending.
 - Feature: Allow users to add various income sources and record them for reports and to allow users to compare
 - Importance: High
 - Development time: low

Personas

Name 1

Age:

Field of Study:

Location:

Relationship status:

Works?

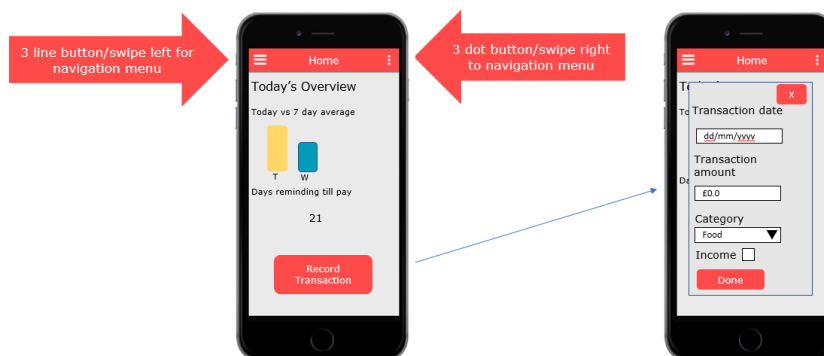
Story

Storyboard Finalisation

Dates: Started 03/03/18 and finished 14/03/2018 Estimated time: 3 hours

Summary: Remaining mock ups were completed, navigation structure explained and demonstrated with links in document. Final proof checks were done, and phone background changed due decision to switch to Android Development from iOS Development due to lack access to Mac machine.

Budgeter Mock ups: Home/Overview page



Personas Finalisation

Dates: Started 03/03/18 and finished 14/03/2018 Estimated time: 1.8 hour

Summary: Persona stories added, and ratings of budget ability added for extra personality. Also, final proof checks were done.

Experience with budgeting



User Stories and Business Case Finalisation

Dates: Started 14/03/18 and finished 14/03/2018 Estimated time: 0.3 hour

Summary: Names and images were added to user stories, moreover they were modified to be more in line to what a user would say (i.e. not directly related to specific feature). Business case and User stories got their final proofs as well.



Moodboard and Fontboard Finalisation

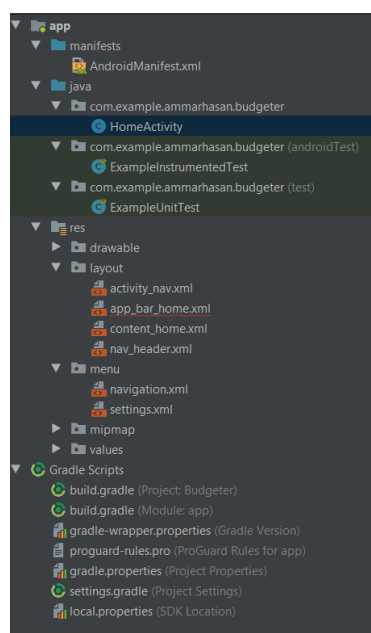
Dates: Started 14/03/18 and finished 14/03/2018 Estimated time: 0.3 hour

Summary: Final drafts were deemed complete here and simply double checked

Android Studio Initial Experiences

Dates: Started 26/03/18 and finished 30/03/18 Estimated time: 4.5 hours

Summary: Basic tutorials were done in Android Studio website. The creation of a project and was tested (setting up Git, navigation panels, titles, etc.). However, progress was limited and the need for a full set of video tutorials was clear. Moreover, The Decision to use Java against Swift was made here, as Swift proved to be difficult to learn in a limited time period.



Application Setup Planning

Dates: Started 27/03/18 and finished 27/03/18 Estimated time: 0.5 hours

Summary: Basic plan and database setup was brainstormed and outlined. A list of tasks and tables was made.

Dev tasks:

- Add all screens
- Connect screens via navigation
- Setup login system
- Setup transactions system
- Setup saving targets
- Setup budgets
- Setup salaries
- Setup data display

Database structure (tables):


- Users
 - userId
 - name
 - bank
 - monthSavingTarg
- UserPref
 - userId
 - pref1
 - pref2
 - ...
- Transactions
 - transId
 - userId
 - amount
 - in
- Salaries
 - salId
 - userId
 - date
 - amount
 - expires

First Tutorials and Prototype Planning

Dates: Started 03/04/18 and finished 03/04/18 Estimated time: 1.8 hours

Summary: I followed Android Studio Build Your First App tutorial (Google, 2018a). Notes about Android studio were taken, and comments added to the project for future reference. The tutorial provided me with the basic understand of Android Studio's layout and useful tools like String Resources.

This is a [string resources](#) file where you should specify all your UI strings. Doing so allows you to manage all UI strings in a single location, which makes it easier to find, update, and localize (compared to hard-coding strings in your layout or app code).

2. Click **Open editor** at the top of the editor window. This opens the [Translations Editor](#), which provides a simple interface for adding and editing your default strings, and helps keep all your translated strings organized.
3. Click **Add Key**  to create a new string as the "hint text" for the text box.
 1. Enter "edit_message" for the key name.
 2. Enter "Enter a message" for the value.
 3. Click **OK**.
4. Add another key named "button_send" with a value of "Send".

Now you can set these strings for each view. So return to the layout file by clicking **activity_main.xml** in the tab bar, and add the strings as follows:

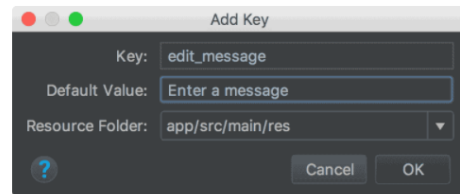


Figure 7. The dialog to add a new string

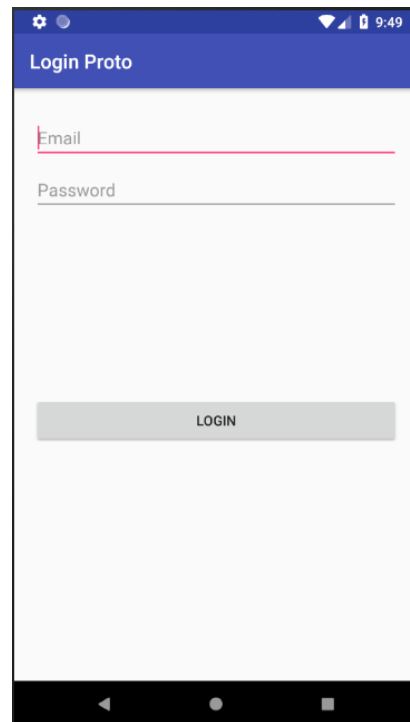
Moreover, the tutorial provided inspiration for the next steps in the App development process. Instead of trying to create the app in one go which was difficult, a prototype with functional navigation and Log In will be created based on other independent prototypes. The prototype will act as the starting point of development containing mock pages for Budgeters pages, and will be based on two separate prototypes:

1. A Log in Prototype, which will be created with the help of online tutorials. It will provide log in functionality via database back end and will send the user to an empty activity if combination is correct.
2. A Navigation Prototype, which will navigate users throughout separate mock pages which will be created using online tutorials as well.

Log in Prototype

Dates: Started 04/04/18 and finished 04/04/18 Estimated time: 3.4 hours

Summary: A Firebase database was constructed to allow for authentication and linked to the application via added dependencies to gradle. It uses FirebaseAuth and FirebaseAuthListener to react to login action. This was done with the help of a tutorial (TVAC Studio, 2018).



```
// get Firebase authenticator instance
firebaseAuth = FirebaseAuth.getInstance();
firebaseAuth.signOut(); // clear token

firebaseAuthListener = (AuthStateListener) (firebaseAuth) -> {
    // on state change check if a user exists
    if(firebaseAuth.getCurrentUser() != null){
        // go to welcome screen via intent
        startActivity(
            new Intent( packageContext: MainActivity.this, AccountActivity.class));
    }
};
```

Navigation Prototype

Dates: Started 07/04/18 and finished 07/04/18 Estimated time: 4 hours

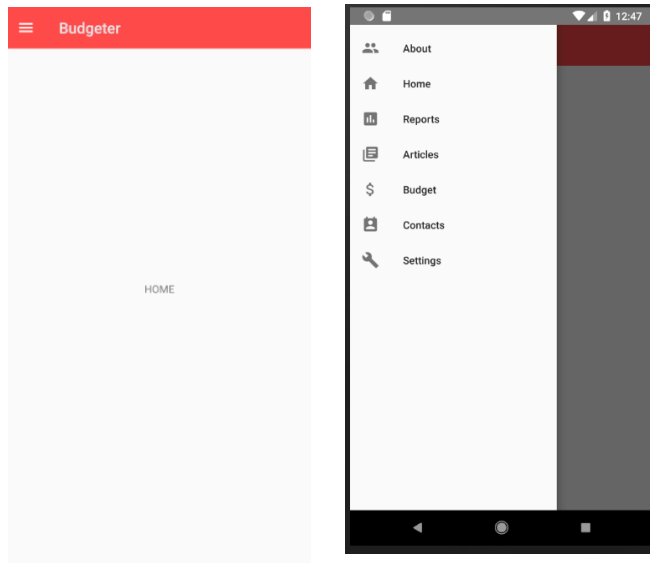
Summary: By following these guides ((Google, 2018b) and (Simplified Coding, 2018)) a navigation page was constructed based on a XML DrawerView with a FrameLayout and a Navigation views as children. Via the use of Fragments, pages would be swapped.



App Mock Pages and Base App Setup (Log In and Navigation Combined Prototype)

Dates: Started 15/04/18 and finished 15/04/18 Estimated time: 3 hours

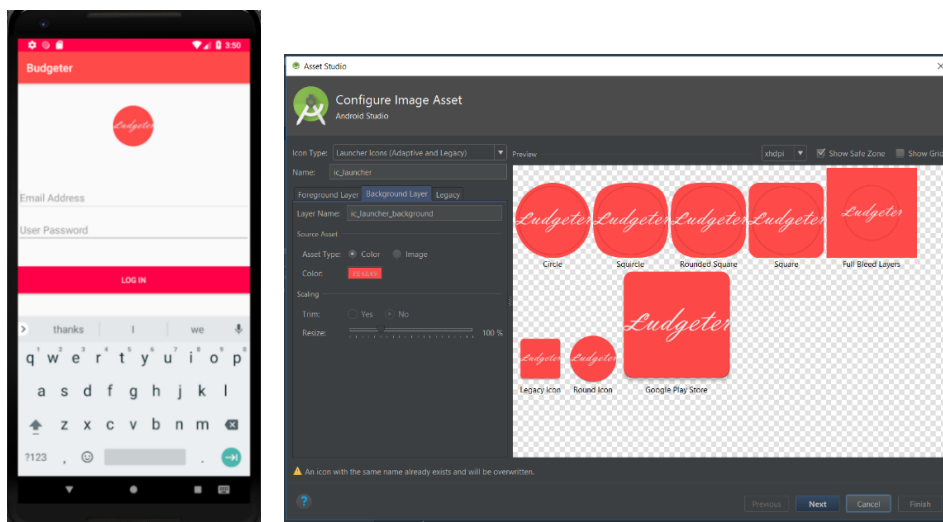
Summary: The previous two prototypes were used in a new project that would be used as the starting point of the project. This was done by following the same steps but this time with mock up pages for the project. Some bugs with dependencies and builds were faced and required adjustment of versions of some dependencies and a clean build to fix. A basic theme was setup alongside the app.



Theme Adjustments and Logo

Dates: Started 24/04/18 and finished 24/04/18 Estimated time: 1 hours

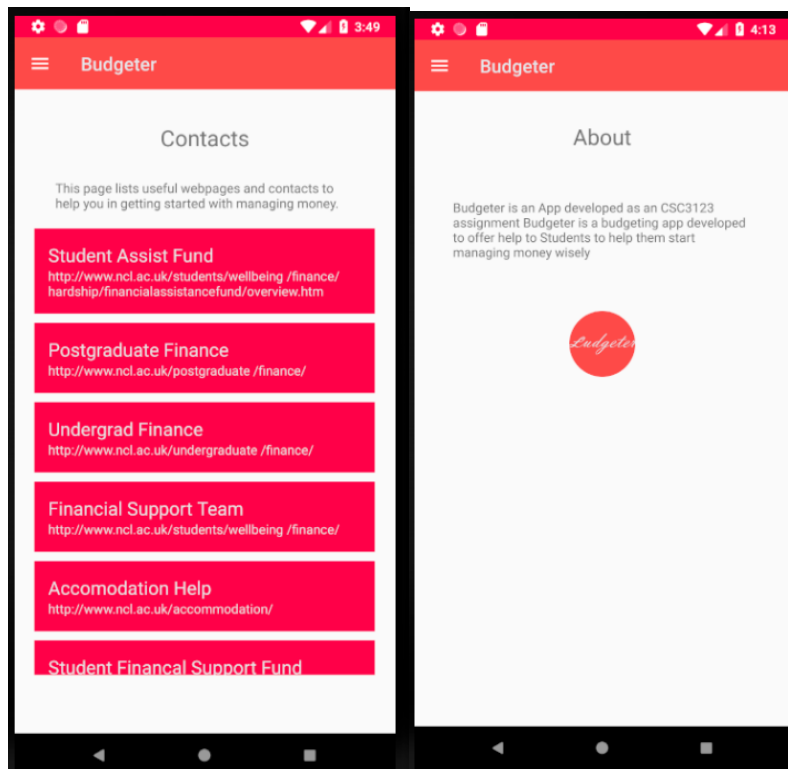
Summary: An app logo was construct using Android Studio's Image Asset Studio. This logo was added to the login page (and later to the about page in the next task). Also, a bug that caused that app to become grey and app name to be black after login was fixed.



Contact and About Fragments (Pages)

Dates: Started 24/04/18 and finished 24/04/18 Estimated time: 2 hours

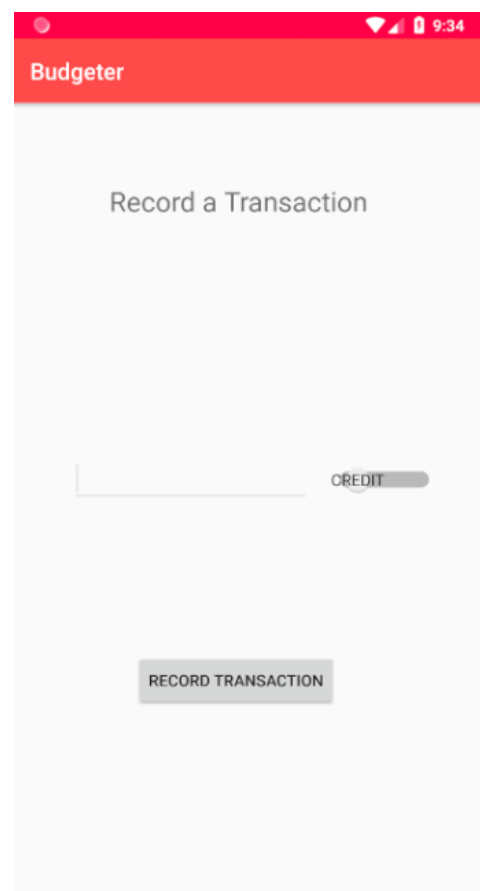
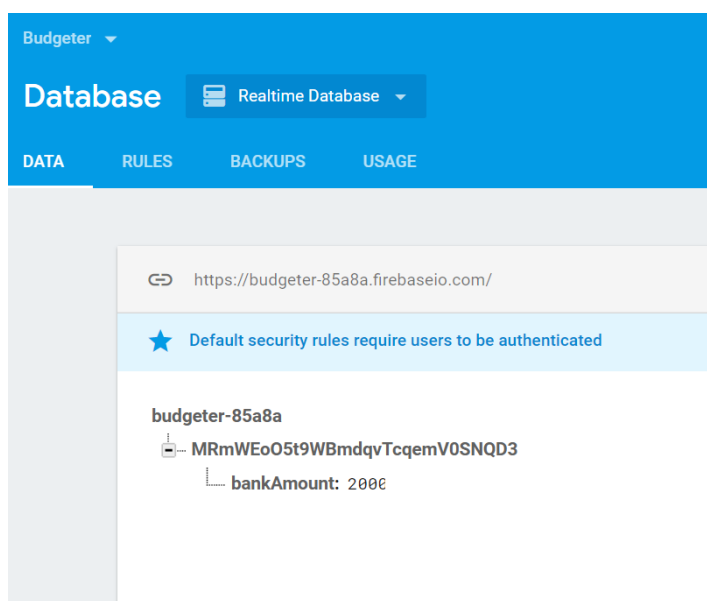
Summary: A basic About page with two text views (one for content one for one for the page heading) and an image view of the app logo was created. Moreover, a contact page with a scroll view with useful contacts was created (this involved a lot of work in the string values files ...). While these pages aren't that essential when it comes to the functionality of the app, their creation provided a lot of help in understanding layouts in Android Studio.



Adding Transactions Base Functionality

Dates: Started 27/04/18 and finished 05/05/18 Estimated time: 3.5 hours

Summary: A new page linked to the home page using Firebase users and real time database methods to add transactions was added and tested. The task extended over a long period of time due to disruption from dissertation work, but the app nonetheless was able to record credit/debit transaction over to the database by the end of task.

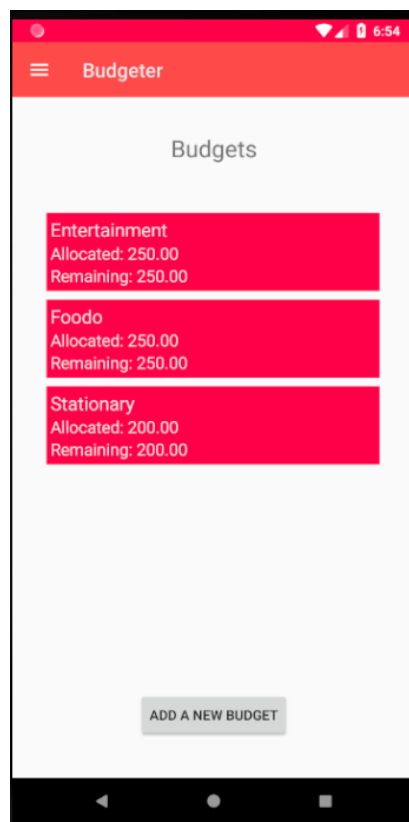


Budget Allocation Functionality

Dates: Started 05/05/18 and finished 05/08/18 Estimated time: 20 hours

Summary: A full budget allocation and management system was created via the budgets page and linked to the transaction page to allow users to select which budget they want to spend from. This feature took an excessive amount of time due to various reasons:

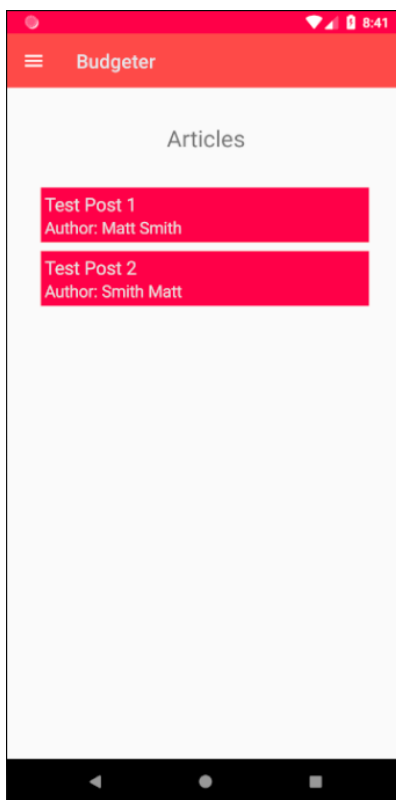
1. Various error checks needed to be done (<0 budgets, budgets that don't fit bank, etc.).
2. Database work, as the plan provided in the Application Setup task needed to be significantly reworked and simplified (e.g. salary system was removed, user object maintains transactions, budgets and other information) as Firebase was used to store objects not tables, and the salary feature was considered redundant as transaction can add funds via credit option.
3. Creating layouts programmatically to generate budget list takes a lot of code and time.
4. Bugs due to getActivity() and context becoming null due to Android Concurrency and Firebase anonymous classes.



Article Functionality

Dates: Started 08/05/18 and finished 08/05/18 Estimated time: 1.5 hours

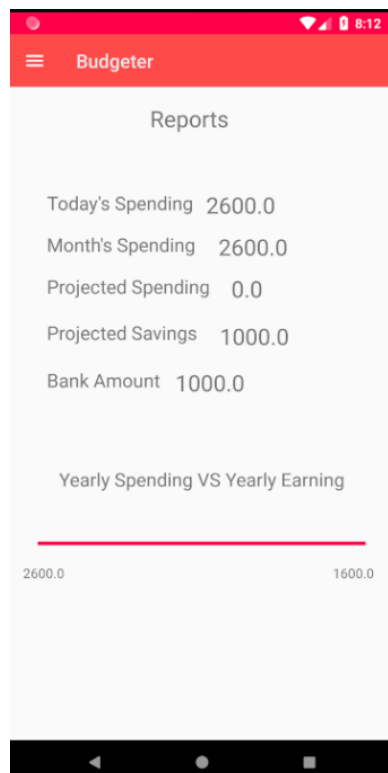
Summary: A feature that allows users to read articles posted in the Firebase database was added. This was programmed similarly to the previous features, but the articles were added to Firebase directly. This task took a lot less since the code was like the previous functionality and it required a lot less checks compared to the previous tasks (user doesn't upload articles).



Report Functionality

Dates: Started 09/05/18 and finished 09/05/18 Estimated time: 3 hours

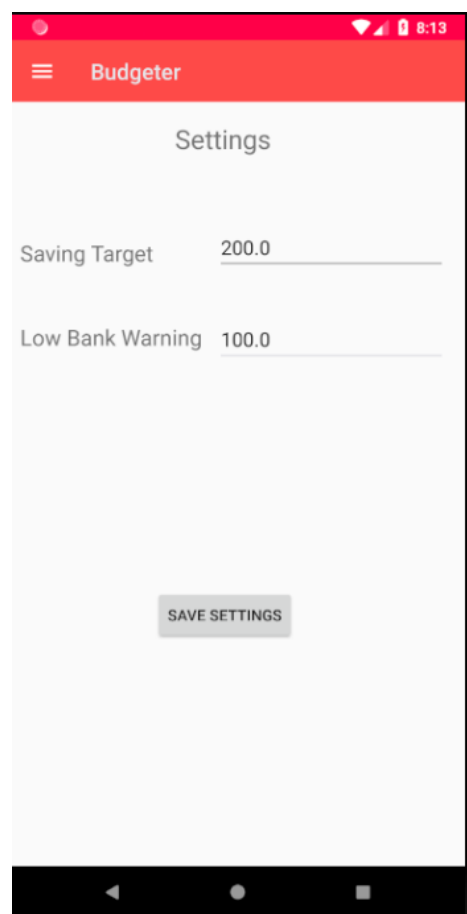
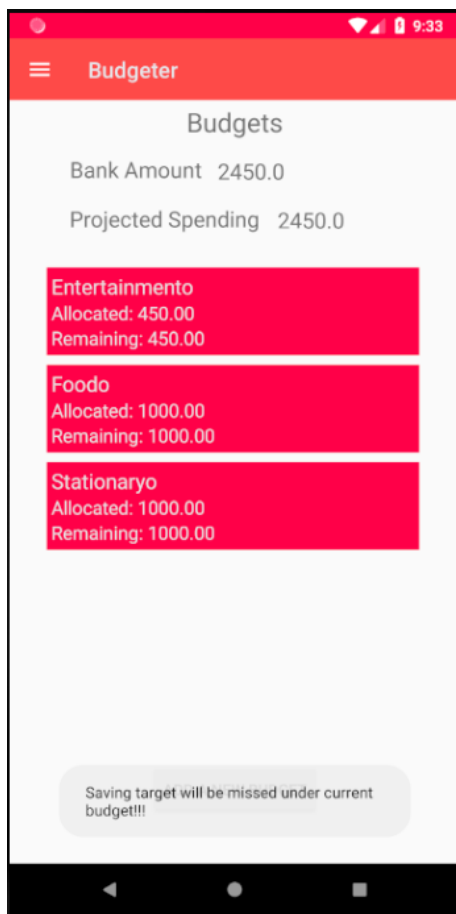
Summary: The report page was completed using methods that read a transaction list and checks its transactions values and dates. Date storage was particularly difficult and this wasn't helped by the fact that many people online seem to fail to comprehend the difference between an instance and a date. Nonetheless, date was stored using a class to wrap the `ZonedDateTime` class to help provide the various values (month spending, year spending, etc.). Similar values were also added to other pages (e.g. day spending to home)



Settings and Warnings Functionality

Dates: Started 09/05/18 and finished 09/05/18 Estimated time: 1 hours

Summary: The notifications were scrapped as it found to be not very useful, since the user will be interacting with the app when they occur (e.g. adding a budget that leads to missing the saving target), and that notifications for articles could be annoying. Hence, warnings using toasts were posted for low bank and budget setups that could miss a saving target. The values of these warnings are controlled in the settings page



References

1. Google (2018a). *Build your first app / Android Developers*. [online] Android Developers. Available at: <https://developer.android.com/training/basics/firstapp/index.html> [Accessed 3 Apr. 2018].
2. TVAC Studio (2018). *Android Studio Tutorial - Firebase User Authentication - User Sign In - Part 9*. [online] YouTube. Available at: <https://www.youtube.com/watch?v=oi-UAwiBigQ> [Accessed 4 Apr. 2018].
3. Google (2018b). *Create a navigation drawer / Android Developers*. [online] Android Developers. Available at: <https://developer.android.com/training/implementing-navigation/nav-drawer.html> [Accessed 7 Apr. 2018].
4. Simplified Coding (2018). *Android Navigation Drawer Tutorial using Fragments - Updated*. [online] YouTube. Available at: https://www.youtube.com/watch?v=J8GB_b8qyK8 [Accessed 7 Apr. 2018].