How to Use this Template

1. Make a copy [File → Make a copy...]
2. Rename this file: “**Capstone_Stage1**”
3. Replace the text in green

Submission Instructions

1. After you’ve completed all the sections, download this document as a PDF [File → Download as PDF]
2. Create a new GitHub repo for the capstone. Name it “**Capstone Project**”
3. Add this document to your repo. Make sure it’s named “**Capstone_Stage1.pdf**”

GitHub Username: PPartisan

Fishless Cycle

Description

Fishless Cycle is a utility app for aquarists who wish to establish biological colonies in their new aquariums, essential for the wellbeing of aquatic wildlife. Fishless Cycle provides set-up guides, tracking utilities and "how-to"s that help chart the progress of a new tank using the "fishless cycling" technique, which is a more humane alternative to older methods that could be harmful and distressing for fish. Features include:

- Ability to monitor several tanks simultaneously.
- Set-up wizards for new tanks, including lists of items to purchase, ammonia dosage calculators and other advice.
- Home-screen widget that displays information for, and allows quick access to, a preferred tank.
- Notification reminders for ammonia dosage times.
- Track the progress of tanks over time with tables of data, bar charts and line charts.

The fishless cycle technique is cheap and compassionate to aquatic wildlife, but traditionally complicated. This app simplifies the process and only offers focused information at relevant times.

Intended User

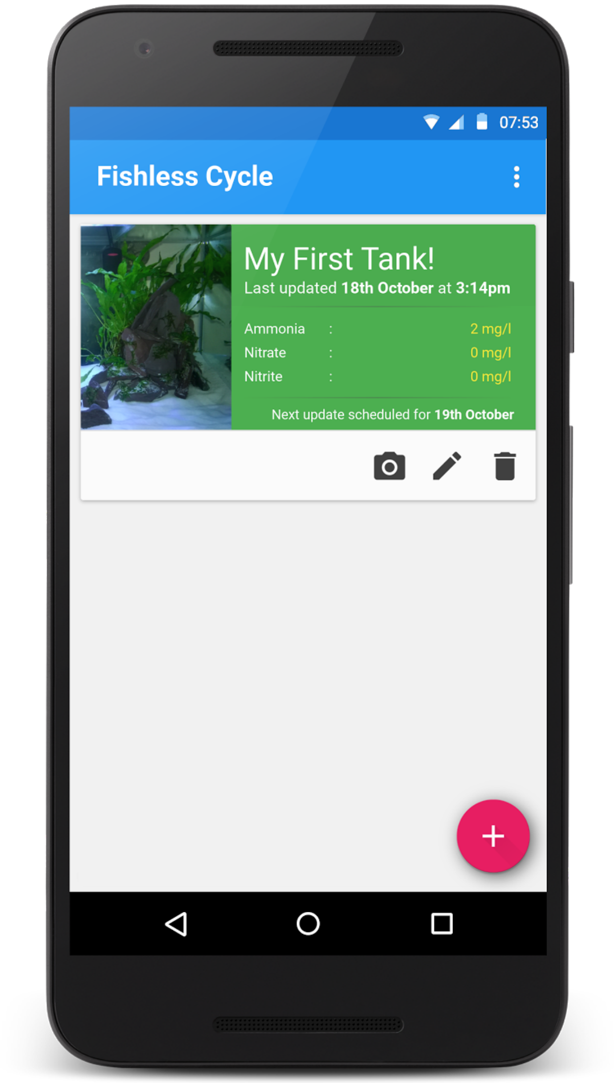
New and experienced aquarium hobbyists who have purchased new tanks.

Features

- Stores information on user-inputted fish tanks to local SQLiteDatabase with ContentProvider. This includes a name, link to an image (optional) and an id value that correlates to a second table containing details on data entries for user-specified dates.
- Interacts with the Camera and gallery to source photos to personalise each "Tank" entry on the home page.
- Adding a new tank launches a set-up wizard, comprised of a ViewPager wherein each page (Fragment) corresponds to a task that aids the set-up process. This includes:
    - An page containing a list of essential and optional items required to conduct a fishless cycle. There will also be an option to skip to the last page to enter all details covered in the set-up wizard manually.
    - A page that calculates the tanks volume based on its measurements, with an option to enter this value manually.

  - A page that calculates the dosage of ammonia based on the tank’s volume, required to reach 5mg/L (ppm) to encourage bacterial growth.
  - Advice on preparing the tank prior to beginning the fishless cycle, including its placement, washing substrate, etc.
  - Taking initial readings of ammonia, nitrite and nitrate levels as a control for future readings.
  - Optional steps, including adding a heater and seed material from another tank.
  - Final confirmation page, with the option to view and override any information generated by the wizard.
- A details page which shows a graph (line or bar) and data table for the tank, tracking levels of ammonia, nitrite and nitrate over time. A floating action button allows for a new entry.

User Interface Mocks



My First Tank!

Last updated **18th October** at **3:14pm**

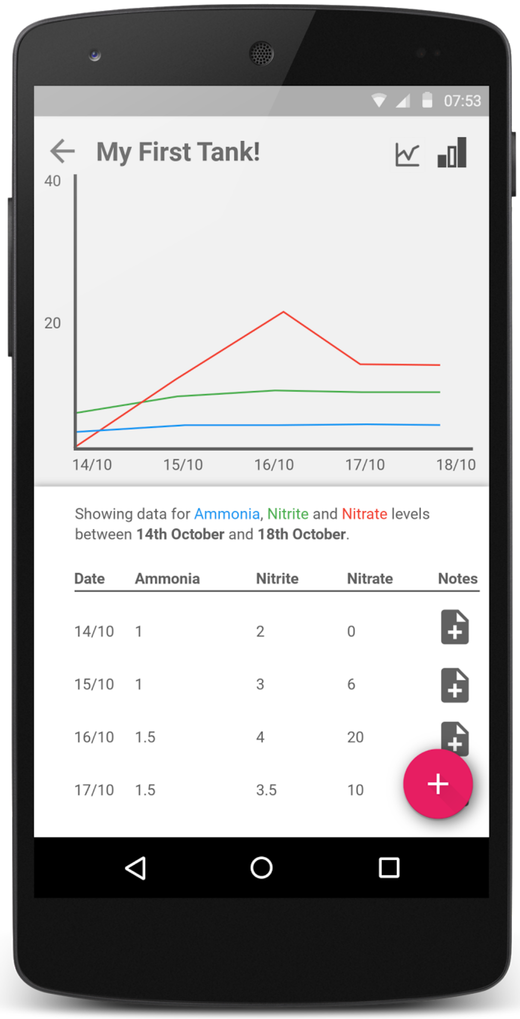
Ammonia	:	2 mg/l
Nitrate	:	0 mg/l
Nitrite	:	0 mg/l

Next update scheduled for **19th October**

Home Screen

- Separate cards for each Tank.
- Pressing the Floating Action Button launches a set-up wizard for creating a new Tank/Card.
- Card contains basic data on the tank: Its name, the date it was last updated, the date the next update is due, and the levels of ammonia, nitrite and nitrate recorded at the last reading.
- Card contains an optional image, sourced from the camera or gallery.

- Card contains buttons to update image, edit title or delete.
- Clicking the card will launch a “details” Activity (see second mock).
- Pressing the Overflow button on the Toolbar will show a Settings option. App wide settings will be limited to setting a “preferred tank”, which will be used in the home-screen widget, and enabling/disabling notifications.



Showing data for Ammonia, Nitrite and Nitrate levels between **14th October** and **18th October**.

Date	Ammonia	Nitrite	Nitrate	Notes
14/10	1	2	0	
15/10	1	3	6	
16/10	1.5	4	20	
17/10	1.5	3.5	10	

Detail Screen

- Reached by clicking a card on the Home Screen
- Shows a line chart/bar graph containing all previously entered data, showing chemical levels in the tank over time.
- Option to switch between graph type on the Toolbar.
- Graph contained inside recessed CollapsingToolbarLayout, which will parallax collapse when the table is scrolled up,

- Option to add a new data row to table with the Floating Action Button.

Key Considerations

How will your app handle data persistence?

App will build a ContentProvider backed by SQLiteDatabase for main data persistence. Settings options will be saved to SharedPreferences.

Describe any corner cases in the UX.

Tablet screens will make use for Master-Detail flow patterns where practicable. For instance, both Home and Detail screens will appear as Fragments on Tablet devices. The Set-Up wizard ViewPager will also show the final “confirmation” Fragment constantly on Tablet devices.

Describe any libraries you’ll be using and share your reasoning for including them.

Picasso for image loading. MPAndroidChart for displaying charts and graphs.

Describe how you will implement Google Play Services.

Google Mobile Ads for displaying interstitial ads when transitioning between Main/Detail Activities. Google Analytics.

Next Steps: Required Tasks

This is the section where you can take the main features of your app (declared above) and decompose them into tangible technical tasks that you can complete incrementally until you have a finished app.

Task 1: Project Setup

Configure gradle imports for:

- Android Design Support Library
- CardView library
- RecyclerView library
- Google Play Services:
    - Analytics

  - Mobile Ads
- ChartView

Task 2: Implement UI for Each Activity and Fragment

- Build UI for MainActivity
- Build UI for DetailActivity
- Build UI for Set-Up Wizard ViewPager
- Adjusts layouts for tablet devices.

In each case use dummy data to populate UI.

Task 3: Build BackEnd

- Create SQLiteDatabase with two tables for Tanks and Tank Data Entries.
- Create ContentProvider.
- Create Model classes for data.

Confirm data is being retrieved correctly with Log calls and tests.

Task 4: Tie BackEnd to UI

- Implement CursorLoaders in necessary activities.
- Replace dummy data with data retrieved from ContentProvider. Remove Log calls.
- Use IntentService to load data from ContentProvider on app start, and after data changes triggered by user action (adding a new tank, adding a new row to a tank's data table, etc.)

Task 5: Widget, Notifications and Services

- Create layout for Widget displaying current Tank information, including time and date of next dosage, and sync updates with ContentProvider.
  - Inside AppWidgetProvider, set an inexact non-repeating alarm with AlarmManager `set()` method to launch six hours and one hour before the next ammonia dose. This will update the widget to show a reminder of the time remaining until next dosage.
- Include Notifications.
- Implement Interstitial Ads and Analytics.

Add as many tasks as you need to complete your app.

Submission Instructions

1. After you’ve completed all the sections, download this document as a PDF [File → Download as PDF]
2. Create a new GitHub repo for the capstone. Name it “**Capstone Project**”
3. Add this document to your repo. Make sure it’s named “**Capstone_Stage1.pdf**”