

QUESTION 1 - PHONE NUMBER NORMALISER

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Introduction

This app is implemented to illustrate how the project should look like after blending with scrum, agile development.

The design and coding standard in the project are optimised for scrum team and agile development.

The quality of the project should meet the industry standard.

Development approach

- MVP (Model-View-Presenter) design is adopted to achieve de-coupling and maximum the flexibility of implementing test cases.
- *ps. de-coupling / low coupling means less chance to update A feature break B feature.*
- BDD (behavior-driven-development) is adopted for unit testing. While one of the test is failed, meaning unexpected behaviour exists and you must not delivery the product before fixing it.
- UI layout are built with auto layout constraints, no nib files have been used - allows code review to be done for UI changes, no more unsolvable nib files conflict.
- objective-clean is using for coding style / standard enforcement
- cocoa-pod is using for external libraries management.
- git is using for source control

In terms of mobile development, an ideal scrum team should have the following:

- Code review process
 - Unit Testing
 - Automation Testing
 - QA Manual Testing
 - Proper documentation
 - Coding style alignment
 - Version control
 - CI (Continuous integration)
- etc... (more on team management)

Resource Limitation

The following is not included due to resource limitation.

- Localisation is out of scope
- Accessibility ID is not added due to no Automation Testing will be conducted.
- Only critical classes are implemented with unit test due to time limit, but it should be able to demo the general concept.
- No icons, no splashing screen, no assets.
- Not much UX design, but doesn't mean i'm not good at UI customisation or do not care about UI

The App - Phone Number Normaliser

Main components of the App.

PNPhoneBook, a phone book which accepts phone number in any characters with any formats.

PNPhoneBookView, it's the main view to layout and coordinate btw presenters. (although it's only one presenter in this project)

PNPhoneListViewPresenter and its presenting views, to display a list of phone numbers

PNPhoneNumberAnalyser, to handle number normalisation

PNGeolocationManager, retrieve current location, translate lat-long to human readable address format and asking user for granting access.

BDD Unit Testing

PNGeolocationManagerSpec

PNPhoneNumberAnalyserSpec

External libraries

libPhoneNumber-iOS - a phone number formatter from Google

Kiwi - BDD unit testing framework

Functionalities

The following are done

When country code and area code are there:

- Normalise a phone number, able to detect area code, country code, the number itself.
- Normalise a phone number in different format, with or without plus sign, spaces etc.
- Normalise a phone number with other non-digit characters in different format
- Determine if the number is mobile number and skip area code - it works for the most of the mobile numbers in the world
- Determine if the normalised number is a valid phone number, not in scope but i have implemented it.

When country code and area code are missing:

- geolocation detection
- Detect country code by geolocation

When country code and area code are missing and geolocation is not available:

- it will automatically detect the country code from sim card network

The following are not done and reason

- Detect area code by geolocation

Area code is much more tricky than country code, one single area with different timezone have different area code, and i can't quickly find a "one for all solution" without using external services. One of possible solution is to manually import a file contains mapping between administrative area name and area code, however, it's still not one for all solution. Time consuming, but it's possible.

Limitation

- Some non-mobile numbers do not have area code (eg. UK voice mail number +44 3069 990840).
- Some numbers are unable to tell if it's fix-line or mobile in US.
- Phone number maybe invalid if the country code is obtained by "Guess with geolocation"

Possible Improvement

Actually, we can do much more for a better country code detection.

We can find the possible country codes of the number by verifying the validity of the number against various country codes.

And pick the nearest to your current location.