University of London International Programmes
CO2226 Software engineering, algorithm design and analysis

Coursework assignment 1 (2015–16)

Testing Android applications

***Note**: You may need to undertake some background reading on Search Based Software Testing (SBSE/SBST) as part of this coursework assignment. This is factored into the time you are expected to spend on thinking, developing test cases and writing and checking your answers to the questions. It is recommended that you devote between one fifth and one third of the time you devote to this coursework assignment on targeted background reading, primarily focused on the answer to Task 2.*

Submission details

Please submit **one** pdf document which is named using the following convention:

FamilyName_SRN_COxxxxcw#.pdf (e.g. Zuckerberg_920000000_CO3323cw2.pdf)

- **FamilyName** is your family name (also known as last name or surname) as it appears in your student record (check your student portal)
- **SRN** is your Student Reference Number, for example 920000000
- **COXXXX** is the course number, for example CO1108, and
- **cw#** is either cw1 (coursework 1) or cw2 (coursework 2).

Scenario

You have been working at a start-up company called Basehook, for just over a year, after graduating. Basehook has developed a reputation for games with a wide user base and compelling and addictive game play (the hook). The games are deployed as apps in the Google Play and Apple App stores.

More recently, Basehook has decided to diversify into other smartphone apps, building on its reputation as a games developer. Your task is to test the recently developed train travel app. The travel app provides several features. You are going to be focusing on testing the Android version of the app, but your test cases may also be reused for testing the Apple app.

The primary features to be tested are the following four:

Journey planner: This allows users to select a home station as the default start and end point for journeys. It allows the user to plan journeys, reporting estimated journey times, and find optimal roots connecting different train services. The planning of the journey is also linked to purchasing tickets. In order for this to work, the app has to connect to a backend database implemented using PHP, running on the web server. Tickets can also be purchased through a web-based interface, and the 'look and feel' of the web-based interface is to be maintained by the app, albeit on a reduced screen size. The algorithm for journey planning has been implemented successfully in the backend PHP system, and needs to be reused for journey planning through the app.

Live updates: Users can register for live updates, which are sent via SMS to the user's smartphone. The user can also see the progress of a particular train on the network via a map view.

Personalisation: The app must provide personalisation facilities so that users can save journeys, ticket choices, seating preferences and other personalised information to make the app more usable.

Sharing: In order to advertise and promote the train companies, their routes and special offers, the app needs to communicate with other apps such as Facebook and Twitter. This functionality is intended to allow the user to choose to share information about journeys they have purchased and will be undertaking via Facebook and Twitter and other social media.

Task 1

Design a set of black box test cases for the travel app. Your test cases should concern both the functional and the non-functional properties of the app. Non-functional properties concern the resources consumed by the app, such as, but not limited to: battery life, response time and network bandwidth. Explain any assumptions you make in the design of your test cases.

[60 marks]

Task 2

Your boss recently attended the International Conference on Software Testing, Verification and Validation (ICST 2015) at which she learnt about Search Based Software Testing (SBST). She believes that search based techniques could be used to automate some of the testing tasks Basehook is currently undertaking manually. In particular, she would like to automate the generation of test inputs to test Android apps. She has seen that SBST has been used to test desktop applications, although it seems less widely used in testing mobile apps. Write a report, explaining, with simple examples, what SBST is, and how SBST can be used to help generate test cases to automatically find faults in Android apps.

Note: Approximately half the marks for this task are available for explaining what SBST is (with suitable simple examples), while the remaining half of the marks will be awarded, based on your explanation of how SBST could be applied to test data generation for Android apps.

[40 marks]

[Total 100 marks]

[END OF COURSEWORK ASSIGNMENT 1]