Exam Part 1 – Software Configuration Management

Student ID: UPXXXXXXX

You have decided to use GitHub as your Software Configuration Management (SCM) system because it is a popular, feature rich and SCRAMBLES Ltd have previous experience with this tool.

This exam **must** be submitted via GitHub using this repository. It is private and accessible only to you.

a) There are 7 files in this repository that you will edit for this mock exam parts 1-7. They are written in Markdown.

- In each of the 7 files replace the Student ID placeholder (UPXXXXXX) with your StudentID. (Approx line ~4 of each of the seven files, see example below)

    Student ID: UP1234567

- Commit these changes to Git
- Push the changes to GitHub
- On the master branch. Verify that your Student ID is visible on each file using the GitHub webpage. Ensure you can see your Student ID as shown in the example below (e.g. UP1234567).

b) You will probably generate images for some Parts 2-7. If you do they must be linked into the Markdown as only the Markdown files will be graded. Please insert the University Logo into **this** Markdown file so that it is visible on GitHub.

- The University logo is stored in the images folder of this repository `images/UoPLogo.jpg`.
- Edit end of the ExamPart1.md file to include the image
- Commit the changes and push to GitHub.
- Using a web browser go to Github and view the Markdown file. The image must be visible on the webpage.

This is how you should include images if required for Parts 2-7

c) Marks will be allocated for the use of Markdown and GitHub in all Parts 2-7.

d) Create a file with the filename `Student.id` on the root of this repo, add **your** Student ID to the content of this file. Commit and push your to your repo `Student.id`. Note:

- Invalid ID = No marks
- The file extension is `.id` other file extensions e.g. `.txt` are not permitted
- The content of the file should be your ID ONLY, e.g. `UP1234567`
- You may have a return character at the end of line one
- You need the `UP`
- Filename is case sensitive
- File contents are case sensitive
- File should contain one line of **text** only
- Markdown formatting is NOT permitted e.g. `*` or `-`

[10 Marks]

Exam Part 2 – Software Process Models

Student ID: UPXXXXXXX

SCRAMBLES Ltd do not want to use an agile development process as they think this is very adhoc and is too similar to their existing style. In reality they do not have a software development process, they are just hacking. You have to convince the senior management to pick a suitable software development model. Propose, describe and justify a software development process, then compare and contrast your selected model with the existing *hacking* development process.

a) Clearly state which Software Process Model you are proposing.

b) Present a comparison table of your process versus the existing *hacking* process; your rationale MUST be specific to the given scenario.

[15 Marks]

Exam Part 3 – Architectural Design

Student ID: UPXXXXXXX

a) Draw ONE architectural diagram that captures all the components of the SCRAMBLES Ltd scenario. Include at least the following components: Mobile phone app, Coop Door, Temperature logger.

b) Provide a short description of the component relationships. This can be either as a separate table or shown as labels on the architectural diagram.

c) Describe in fewer than **50** words:

- one limitation that your chosen architecture imposes on the SCRAMBLES coop door

OR

- one feature your chosen architecture enables. For example a feature that will help SCRAMBLES Ltd sell more coop doors. It must be a new feature that is not listed in the scenario and must be a feature that the end user needs.

[20 Marks]

Exam Part 4 – Testing

Student ID: UPXXXXXXX

Testing is paramount to building a robust software project. Recommend a testing strategy for SCRAMBLES Ltd.

a) Provide an overview of the testing strategy.

b) Recommend tooling to assist with the testing.

c) Provide a testing example for a particular function or feature.

[15 Marks]

Exam Part 5 - System Modeling

Student ID: UPXXXXXXX

Draw a sequence diagram for the “Mobile application, Open Coop Door button” use case. Your diagram must show the calls between components as function calls and include a minimum of one alternative/error case.

[15 Marks]

Exam Part 6 – Implementation

Student ID: UPXXXXXXX

a) Describe **one** feature of the chosen Software Configuration Management (SCM) system (GitHub) that would benefit SCRAMBLES Ltd. State how this will be of benefit.

Example features include, but are not limited to:

- branching,
- continuous integration,
- pull requests,
- insights,
- code documentation,
- release management.

b) Provide a scenario specific example that demonstrates your chosen feature. You can either describe this feature and/or demonstrate it using your submission GitHub repository for **this** exam by including a screenshot of the feature in action.

[15 Marks]

Exam Part 7 – Reflection

Student ID: UPXXXXXXX

The M30819 Coursework CW[1:5] required you to work in groups to design and develop a medium-size 3-tier software system within an application domain.

The final artifact was a 4-page retrospective account of the group project describing, but not limited to:

- what worked
- what did not work
- how the risks were met
- any limitations with estimates

The retrospective account provided examples of lessons learned and guidelines for mitigating problems in future team projects.

Reflect on *your* personal experience within the group. Compare your reflective account with the 3-page retrospective account submitted by your group.

You may want to:

- describe any problems of scale in the group software development
- provide a critical analysis of the problems within your group project
- reflect on the technical and process solutions you applied to the software development
- suggest improvements that you would implement if starting this group project again

[500 words max, 10 Marks]

Checklist

- ☐ CW3.1
- ☐ CW3.2
- ☐ CW3.3
- ☐ CW3.4
- ☐ CW3.5
- ☐ CW3.6
- ☐ CW3.7
- ☐ Submitted