Module Code
COM00112M

MSc Degree Examinations 2018–9

DEPARTMENT OF COMPUTER SCIENCE

Service-Oriented Architectures (SOAR)

Open Individual Assessment

Issued: December 03, 2018, 12:00 (noon)

Submission due: February 11, 2019, 12:00 (noon)

Feedback and marks due: March 11, 2019, 12:00 (noon)

All students should submit their answers through the electronic submission system: http://www.cs.york.ac.uk/student/assessment/submit/ by February 11, 2019, 12:00 (noon). An assessment that has been submitted after this deadline will be marked initially as if it had been handed in on time, but the Board of Examiners will normally apply a lateness penalty.

Your attention is drawn to the section about Academic Misconduct in your Departmental Handbook: https://www.cs.york.ac.uk/student/handbook/.

Any queries on this assessment should be addressed by email to Prof. Dimitris Kolovos at dimitris.kolovos@york.ac.uk. Answers that apply to all students will be posted on the VLE.

Rubric:

Your submission should consist of a single zip file containing your report in PDF and one or more compressed Eclipse projects containing your implementation files and any required libraries.

Your exam number should be on the front cover of your assessment. You should not be otherwise identified anywhere on your submission.

1 The Exercise

For this assessment, you are required to design and implement a note keeping system (Nevernote) that supports multi-user collaboration. The system should consist of a set of web services, and a graphical user interface that enables users to invoke these web services remotely. The web services should allow users to:

- Create a new user account by providing: a desired user name (consisting of no more than 16 alphanumeric characters), their real name, and an email address.
- Create/edit/delete notebooks (i.e. collections of notes). Each notebook has a name which must be unique among the user's notebooks.
- Create/edit/update notes in notebooks. Each note has a title, a description and a "starred" flag. Starred notes should be automatically listed under a virtual, unmodifiable, "Starred" notebook. Each user has their own "Starred" notebook.
- Share notebooks with other users of the system and specify their access level (read or read/write).
- Un-share previously-shared notebooks.

2 Questions

Answer **all** questions. Note the page limits for each question. Parts of answers that go beyond the page limit will not be marked. References must be listed at the end of the document and do not count towards page limits.

2.1 System Design

Use a UML class diagram and appropriate stereotypes to design services, service operations, entities and faults for the functionality described in Section 1. Discuss the class diagram, state any assumptions you have made, and also discuss any parts of the design of the system that are not reflected in the class diagram (e.g. the use of message queues). [20 marks] (max. 5 pages)

2.2 Implementation

Implement the service operations designed for Question 2.1 using Apache Axis, WSDL and SOAP. If your implementation needs to store data (e.g. the details and credentials of the users registered with the system), you can use XML files or an embedded Java database (e.g. H2[1]) for this purpose. Briefly discuss your implementation. [20 marks] (max. 5 pages)

2.3 Authentication

Add support for authentication to appropriate service operations. Briefly discuss your rationale (e.g. service operation X needs to be protected by authentication to avoid impersonation). [15 marks] (max. 3 pages)

2.4 Client Implementation

Implement a graphical client (e.g. a Java Swing application or a web application) that enables remote users to invoke the web services you have implemented in an end-user-friendly way. Briefly discuss your implementation and provide a screenshot of the graphical client. [15 marks] (max. 3 pages)

[1] http://www.h2database.com/

2.5 Push Notifications

Add support for push notifications so that users do not need to poll the system periodically to check for changes made by other users to notes in shared notebooks. Briefly discuss your implementation. [15 marks] (max. 2 pages)
Quality and conciseness of description and depth of analysis are more important than length. The report and the implementation will also be marked for the clarity, precision and conciseness with which your ideas are communicated. [15 marks]

End of examination paper