

Inf2C Software Engineering 2017-18

Tutorial 4 (Week 10)

Software development processes, testing

Study this tutorial sheet and make notes of your answers **BEFORE** the tutorial.

1 Introduction

This question gathers together Inf2C-SE exam questions from recent years that pose example software development scenarios and ask about which processes and testing approaches might be most appropriate for each.

2 Exam questions

Each question is allocated a number of marks appropriate for the exam style in recent years where, for a one hour exam, students are expected to complete 50 marks-worth of questions.

1. You are the technical lead in your company for a new product aimed at university research scientists: an electronic lab notebook (ELN). The marketing team has given you the following information.

The scientists who will use the ELN traditionally record their experiments in paper notebooks, but increasingly they are looking for digital solutions which allow them to share their information with other scientists they are working with, such as Wikis and Dropbox, which make frequent functionality changes. A small amount of market research indicates that the scientists vary considerably in what the capabilities they would like in an ELN, and the ELN solution will need to change over time as the scientists' needs change. However the scientists all say an ELN should be easy to use and quick to use. The scientists work in labs headed by a senior academic (the Lab Head). Provision of computing resources for the lab (hardware and software) varies between labs. Some have all their needs met by the central university IT department; others manage all their own hardware and software and depend on central IT only for network connections; most are somewhere in between.

Which software development process is likely to be most appropriate for developing the software system? Explain why, contrasting your choice with one other software development process. **[5 marks]**

2. You are part of a large, high-ceremony project in an ISO9001 certified organisation which builds embedded software for televisions. Your new manager complains that it takes too much time to do code reviews as well as unit testing, and wants to limit both to where they are most effective. She points out that Extreme Programming does not include code reviews, and suggests that your project should drop them completely so that there will be enough time to do testing to find all bugs.
 - (a) Write an explanation, suitable for inclusion in an email, of the different advantages of unit testing and code reviews (mention three). Respond to her point about XP, mentioning three relevant XP practices and the utility of testing to prove software is bug-free. **[10 marks]**
 - (b) Assume that you cannot unit test every piece of code, that you cannot review every piece of code, and that you cannot both review and unit test any piece of code. How would you decide whether a given piece of code should be unit tested, reviewed, or neither? **[3 marks]**
3. You are in charge of a large team based in London, Manchester and Edinburgh, developing the train operations control system for the new HS2 high speed train. Would you adopt XP? If not, then what process would you adopt and why? **[4 marks]**
4. Which software process model best supports development of applications with user interfaces, and why? **[3 marks]**