

# Software Testing Tutorial LO 5

There are *five* tutorial topics scheduled for the Software Testing course. Each of these will be discussed over two weeks. In the first week the group will work on a preparatory task without a tutor and in the second the group will work with the tutor. The goal is to use the software you are working with to demonstrate your capability in relation to the specific learning outcome.

Recall LO 5 is “*Conduct reviews and inspections and design and implement automated testing processes.*” This is an ambitious LO and we have decided that the requirements should be moderated to reduce workload. See the detailed descriptions of the LO at the end of this note. This section of your portfolio should consider:

- The code for your software,
- The quality attributes you want for the code as reflected in the requirements,
- The types of inspection you would like to use,
- How you would go about automating some aspects of the quality checking.

For all but the most trivial requirement there will always be a gap between the requirement and what can be achieved through testing. Review and inspections provide a different approach to quality assurance that is more based on expertise so it can provide more confidence the code is correct.

There are some key points to note in developing this section of your portfolio. It may be that some parts of the portfolio section will not be possible to write until later in the semester:

- Ideally you will have some test case specifications developed but these may still be in development, and you may not have the tests that meet the specifications and the software is still in development.
- It is likely that your evaluation of tests will reveal possible areas of weakness that you feel you cannot adequately test. In this LO you should consider what you can gain from review and inspections..
- Remember you have limited time to consider some review approaches and so you will not be able to do all the work to review your code. Being able to identify such limitations whether you do anything about them is an important part of your testing evaluation effort.

The LO 5 section should build on the LO 3 and LO 4 sections of your portfolio. The LO 5 section should provide good evidence that you understand the limitations of your test suites and how reviews and inspections can increase your confidence the code is fit for purpose. This can comprise some detailed analysis of a small subset of some requirements and a summary of what could be done for the whole test suite.

## Preparation session, week 10 (21 Nov – 25 Nov)

A good preparation for this activity is to read Young & Pezze chapters 18 and 23. These chapters consider approaches to inspections and review and the automation of test.

It is likely that your testing activity will not be complete when you begin the work of considering your LO5 portfolio section. In the preparation tutorial you should split into small groups and do the following three activities. After each, have a short discussion on the issues raised across all the groups. This should identify similarities and differences in approach across the groups

1. Choose one of the functional requirements at least one of the group members is considering. You should each have a small set of requirements you have been considering recently. Then consider:
  - The requirement.
  - What code you intend to implement the requirement.
  - Your planned testing to see if the requirement has been satisfiedCan you see any clear deficiencies in the proposed testing that are difficult to improve by adding additional testing. Can you think of an approach involving inspecting the code that might help tackle the issue?
2. As in 1. above, but this time choose one of the measurable attributes you have been working with. Again, think of potential deficiencies in your approach to the measurable attribute. Do you think some approach to review or inspection could improve your confidence that your code can achieve the required level for the measurable attribute?
3. Now, compare the deficiencies you have identified – are they similar or different? Why do you think this is the case. To what extent do you think the reviews or inspections you have considered could be automated?

## Tutored session, week 11 (28 Nov – 2 Dec)

The goal of this tutorial is to consider what would be a good section on LO 5 for your portfolio. This involves considering the grading scheme. Here are the four sub-criteria LO 5 is graded on (recall each is graded in the range 0-5) with the interpretation provided in the Marking Scheme.

In the tutored session the tutor will briefly present an outline of the sorts of evidence that could support your LO 5 portfolio section and the groups will assess the document and consider the construction of a portfolio section for LO 5.

5. Conduct reviews and inspections and design and implement automated testing processes. This section covers review processes and the place of testing in modern software development in a DevOps environment using CI/CD. The remaining three sections relate to the section of the portfolio that describes the CI pipeline constructed (5.2). **On reviewing this LO, it seems that this may require too much work to complete in the time available so the subcriteria have been modified to reflect this.**
  - 5.1. Identify and apply review criteria to selected parts of the code and identify issues in the code. Software quality depends on many different elements and review is important. The portfolio should identify appropriate review techniques and point to the results
  - 5.2. Construct an appropriate CI pipeline for the software: **Here you should describe the design of an appropriate CI pipeline, indicating how you would go about building the pipeline but you are not required to build a pipeline.**

- 5.3. Automate some aspects of the testing. Here you should consider the embedding of testing in the pipeline and what would be required level of testing for a CI environment.
- 5.4. Demonstrate the CI pipeline functions as expected. Here you should indicate the kinds of issues your proposed CI pipeline would identify and provide some examples of how you propose these issues would be identified.