11. Test tools

Automated testing
Test tools – overview
Assignment 2

Automated testing

- Computer systems that are being developed today are increasingly complex

- Manual testing with acceptable levels of coverage becomes less and less realistic

- Test tools which (partially) automate the testing process would be of great benefit

Automated testing

"Automation is the integration of testing tools into the test environment in such a fashion that the test execution, logging, and comparison of results are done with minimal human intervention."

(R Craig & SP Jaskiel)

Test tools

- Tools can
  - Automate repetitive tasks
  - Automate tedious tasks
  - Produce quantitative measures and metrics
  - Help to maintain the documentation

- Tools cannot
  - Make up the tests for you
  - Tell what the right answers should be – YOU have to supply the correct answers (always in consultation with the user!)

Automated testing

- Common pitfalls

  - Great expectations
  - No clear strategy for the tool use
  - Automating the wrong thing
  - Choosing the wrong tool
  - Underestimating time and resources
  - Poor software / poor training
  - Cost of buying the tools / temptation to develop some at home

Automated testing

- Test tools are about automating an **existing manual** testing process
- A formalised manual testing process should already be in operation – if not, it should be developed before the introduction of any test tools.
- Examples of formal components:
  - Detailed test cases, including predictable "expected results", which have been developed from Functional Specification and Design documentation
  - A standalone Test Environment, including a Test Database that is restorable to a known constant, such that the test cases are able to be repeated each time there are modifications made to the application

Zambelich

Test tools

- There are many different categories of software testing tools

- Normally a tool of a given type is associated with a particular stage of the software development cycle

- Some tools straddle across several stages, for example Automated Regression Testers

Test tools

- Requirements testing tools
- Static (source code) analysis tools
- Regression testing tools
- Test design tools
- Test input data preparation tools
- Test running tools
- Comparison tools
- Test harnesses and drivers
- Test script generators
- Simulators

- Performance (load/stress) test tools
- Dynamic analysis tools
- Debugging tools
- Test management tools
- Coverage measurement / analysis tools
- Hyperlink testing tools
- Monitoring tools
- Security testing tools
- Test oracles

BCS classification (http://www.bcs.org/upload/pdf/practsyll.pdf)

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Test tools for group presentations

1. Static (source code) analysis tools
2. Regression testing tools
3. Test script generators
4. Test input data preparation tools
5. Comparison tools
6. Test harnesses and drivers
7. Dynamic analysis tools & debugging tools
8. Test management tools
9. Coverage measurement / analysis tools

Assignment 2

- Groups

- Topics

- Dates

Assignment 2

- Presentation
  - 15 minutes
  - PowerPoint or PDF (Acrobat) presentations
  - Electronic presentation files with me 2 hrs before the presentation <u>at the latest</u>

- Written summary
  - About 1,500 words (2-3 pages)
  - Appendix with the presentation slides
  - Deadline: 12:00 4 April 2011
  - Copies of all the presentations will be given to all the students on the course – essential for exam preparation

Assignment 2

- Marking
  - A single mark for both components of this assessment
  - All members of the group will be given the same mark
  - The key factors for the assessment of the presentations and the written description outlined