Project: Continuous Integration Environments, 5 ECTS.

Deadline: 2018-03-16 **Grade:** Pass/fail

Background:

The movement towards agile and more continuous ways-of-working have promoted speed and frequent delivery to the point that manual testing is no longer a feasible option for most types of testing. This is mostly justified by the benefits of more frequent feedback that allows developers to quicker find defects and mitigate defect synergy effects that add cost and effort for quality assurance.

To support continuous testing and feedback, automated tests are crucial. Preferably on all levels of system abstraction: unit-, integration-, system- and acceptance-tests. In addition, these tests should be run often, executed automatically without human interaction or input in a so-called continuous integration environment.

Project description:

In teams of four (4) students, set up a continuous integration (CI) environment that can execute tests. The system shall respond to developer code pushes and from push, build the entire system and run, at least, unit and integration test cases but preferably system tests. The environment must include:

1. An integrated development environment (e.g. Eclipse or intellij IDEA)
2. A version control software (e.g. SVN, SourceTree or EGit plugin for Eclipse)
3. A version control server (e.g. Bitbucket or Github)
4. A continuous integration (CI) tool (e.g. Jenkins)
5. An automated build tool that connects to the CI tool (e.g. Maven or Ant)
6. An automated test framework for AT LEAST unit and integration tests (e.g. XUnit)
7. (optional) A system test tool (e.g. EyeAutomate or Selenium)

You are free to choose and constellation of tools that you like but it shall be able to run the pre-prepared Maven Java application associated with the student group-project. Three tasks shall be performed with the Java project as explained in the following sub sections:

Task 1: CI-environment setup.

Setup the CI environment with components from the above list that can automatically build the project and run its unit and integration tests. Once the system runs, make a screen recording of the environment executing. You must also supply a model of your CI system, its components, and how they interact (e.g. how they are triggered and in what order). **OBS: You don't need to setup a remote Jenkins server (Local server is acceptable) if you lack the resources to do so.**

Task 2: Test-driven development

In the project, a set of test cases have been added that do not have any associated functional code. Run the tests and record that they all fail because the code is missing. Implement the code and run the tests, showing that the code builds successfully and all tests pass. The code needs to be implemented by all team members that should individually commit/push some code. Hence, after the project there should be AT LEAST one push from each team member. A screenshot shall be supplied verifying this!

Task 3: Continuous development and testing

Extend the java project with new code and tests. The new tests should include at least unit and integration styled tests that follow best test practices but preferably (optional) also some type higher-level system tests performed with Selenium or EyeAutomate. **Note! ALL tests, regardless of type, must be executed AUTOMATICALLY from the CI environment!**

Deliverables:

In addition to above stated screen-recordings, screenshots and models of the environment, each group must supply a report that describes the CI environment, motivate the technical choices of tools, report the challenges that they came across during development of the environment and report solutions to said challenges. The report can be maximum 5 pages. Each group must also provide a link to the code repository where the code is stored.

Additionally:

We have a set of extra tests that we will run on your code to "as customers" to acceptance test your code! This means that you need to consider the quality of your solution such that we can EASILY extend the test suite with our tests. Hence, no hard-coding values, etc. **Obs! Make sure that all team-members are mentioned when you submit your report, recordings, screenshots, etc., on ITSLearning. The submission shall be in a .zip or .rar file (Remember to rename it to .txt to submit).**

Good luck!