COMP 3111: Introduction to Software Engineering

Activity 3: Final System Implementation and Testing

Assigned: March 22, 2016 — Value: 40% of project grade
Due dates: See When and What to Submit (**REVISED** on 21/04/2106) — Activity type: Team

FINAL SYSTEM IMPLEMENTATION

You are required to implement all the functionality for the web-based securities portfolio management system stated in the problem statement as well as the additional feature that you proposed in the System Requirements Specification and any additional/amended requirements added in the *System Requirements Q&A* web page. Your final system implementation will undergo three types of tests: unit testing, peer acceptance testing and final acceptance testing.

UNIT TESTING

Requirements for unit testing will be released after the unit testing lab.

PEER ACCEPTANCE TESTING

Peer Acceptance Testing will be performed using a set of acceptance test cases constructed by each project team that will be used to validate and verify another project team's system implementation.

A. Test Case Rules and Restrictions

The following rules and restrictions apply to the acceptance test cases constructed by each project team.

1. ***There must be exactly 20 test cases.*** The goal of the test cases should be to uncover as many defects (functional or internal) as possible. If there are less than 20 test cases, then the team being tested will be awarded the test case testing points for each test case less then 20.
2. ***The test cases do not have to cover all of the system requirements.*** You are free to choose which system requirements you want to test with your test cases.
3. ***Each test case can test at most one system requirement.*** Each test case must state what requirement it is testing and its purpose. A list of the system requirements that can be tested is given below. While there can be multiple test cases for the same requirement, each test case must be for a *unique* aspect of the requirement. For example, while there can be several test cases that test the search capability of a system, each test case must exercise a *different* aspect of the search capability (e.g., search for an item that exists; search for an item that does not exist, etc.).
4. ***Each test case can use at most one browser window.*** Support for multiple users/concurrency is not a requirement of the system and so cannot be tested.
5. ***A test case cannot disable required browser functionality.*** For example, if JavaScript is required to run the system, then it cannot be disabled.
6. ***A test case cannot require that a URL be entered directly into a browser.*** All test cases that test user functionality must make use of the user interface of the system only. However, accessing system administration functions or external systems is an exception where a URL may be typed directly into the browser.
7. **A test case cannot require that the database be directly modified.** All test cases must use the user interface provided by the system. However, manually changing the database may be allowed at the discretion of the assessor if required to change the database so as to allow further test cases to be run.
8. ***A test case cannot use SQL injection or include HTML code either as input or in a search condition.***

B. Required Test Case Information

Each test case must be numbered and include the following information.

1. The *requirement that is being tested* as numbered and stated in the problem statement.
2. The *purpose of the test case* (i.e., what unique aspect of the requirement is being tested).
3. All *data values that are required* to execute the test case, if any.
4. The *type of the test case*, which should be one of the following.
   - Valid – should execute normally without raising an error condition.
   - Invalid – should cause an error condition to be raised.
5. The *expected output* of the test case, which should be one of the following.
   - *For a valid test case*, the expected data output, if any, or result.
   - *For an invalid test case*, the expected error message and the reason why the test case is invalid.

Note: ***There is a required format for the test cases that can be downloaded from the Project Resources module of the course web page.***

C. Testing Session Rules and Restrictions

1. ***Restarting the system is allowed.*** *Debugging is not allowed*. The first restart will incur a penalty of 10%. Each subsequent restart will incur an additional 1% penalty.
2. ***At least three members from a team must be present during a testing session.*** Two team members will execute the test cases that are provided by another team on their own system, while a third team member will direct the testing of another team's system.
3. ***A testing session will last at most 50 minutes.*** A testing session will end either when all test cases have been performed ***or*** the system being tested cannot perform further test cases ***or*** the testing session ends, *whichever comes first*.
4. ***Any test cases not attempted by the end of a testing session will not be considered for scoring.*** Test cases not attempted will not be counted in the score for either the team being tested or the team doing the testing.

D. Scoring System

For test case construction (60 points)

1. Each test case is worth 3 points.
2. Each test case will be evaluated as to its correctness, completeness and adherence to the testing rules and restrictions. *No points will be awarded for a test case that breaks a testing rule or restriction.*
3. A project team may be required to construct a new test case for any test case found to be incorrect, incomplete or that does not adhere to a testing rule or restriction. No points will be awarded for a new test case. Failure to provide a new test case will result in further loss of points during testing.

For test case testing (40 to 80 points)

1. Each test case is worth 2 points.
2. Each team will be scored out of 40.
3. The points for each test case will be awarded as follows.
   - *If the system passes the test case:* to the team whose system is being tested.
   - *If the system fails the test case:* to the team that constructed the test case.

   The assessor will be the final arbitrator of whether the system passes or fails a test case.
4. The maximum possible score is 80 out of 40, which occurs if a team's system passes all of the test cases constructed by another team and all of the team's test cases cause another team's system to fail.

E. System Requirements That Can Be Tested

1. Account application
2. Client login accounts
3. Securities searching
4. Buying and selling securities
5. Client support tools
6. Report generation

Testing Schedule

Peer acceptance testing will take palce in the lab sessions on May 3.

FINAL ACCEPTANCE TESTING

Final Acceptance Testing will be performed by the course teaching team using a set of acceptance test cases constructed by them to validate and verify your final system implementation.

WHEN AND WHAT TO SUBMIT

1. **On Tuesday, April 19 by 5:00 p.m.**

   Submit the test cases for Peer Acceptance Testing. ***Test cases cannot be changed after submission unless required by the course teaching team.***

2. **On Monday, May 9 by 11:59 p.m.**

   To submit your final system implementation, place your web application folder inside a folder named with your team number (e.g., "Team101"), zip it and submit it via CASS before the submission deadline. as described in Activity 1.

3. **On Thursday, May 5 in the lecture**

   Submit the completed **Activity 3: Final System Implementation and Acceptance Testing—Individual Contribution** form, which can be downloaded from the Project Resources module of the course web page.

WHERE TO SUBMIT

1. Submit your test case documentation into the box that will be provided on the counter in the CSE Admin office (Room 3528).
2. Submit your completed **Activity 3: Final System Implementation and Acceptance Testing—Individual Contribution** form in the lecture along with your final minutes and final burndown chart.

ACTIVITY 3 GRADING

Item	Marks	% of Project Mark
Additional Feature Implementation	10	4%
Project Management (weekly minutes and burndown chart)	10	4%
Unit Testing	20	8%
Peer Acceptance Testing	20	8%
Final Acceptance Testing	40	16%

CLARIFCATION AND AMENDMENT OF PROJECT/ACTIVITY REQUIREMENTS

Further clarification of general issues related to the course project is provided in the *Project General Q&A* module of the course web page. Please read this information.

Furthermore, each project team can ask clarification questions of the client representative regarding the requirements stated in the problem statement or the Final System Implementation and Acceptance Testing activity. ***All questions should be submitted to the client representative by email at 3111rep@cse.ust.hk or by Twitter at @3111rep.*** The submitted questions and their replies will be posted on the appropriate web page, which can be accessed from the *Project Specific Q&A* module of the course web page. ***You should check these web pages on a regular basis for further clarification and amendment of project requirements.*** Any requirement added or amended on a web page in the *Project Specific Q&A* module of the course web page becomes part of the project requirements.