General Ideas: Web App Testing

CS 3250
Software Testing

[R. Chopra, "Software Testing," Ch. 11]

[G. Bath and J. McKay, "The Software Test Engineer's Handbook: A study Guide for the ISTQB Test Analyst and Technical Test Analyst Advanced Level Certificates"]

Web App Testing

- Increasingly reliance on web apps

- Many types of users connected – web apps should respond according to the user requirements

- Reliable behavior of the apps is crucial

- Two main categories
  - Functional testing
  - Non-functional testing *(good to know, will not be tested)*

Functional Testing

Verify and Validate (V&V) that

the software behaves as expected

(static and dynamic)

CS 3250 mainly focuses on functional testing

using **coverage criteria**

Non-Functional Testing

- Configuration testing

- Usability Testing

- Performance testing

- Scalability testing

- Security testing

- Recoverability testing

- Reliability testing

- Requirements and assumptions are understood by the development team

- Test environments with those choices are put in place to properly test

Non-Functional Testing

- Configuration testing

- Usability Testing

- Performance testing

- Scalability testing

- Security testing

- Recoverability testing

- Reliability testing

- Compliance with standards and guidelines established throughout the industry

- Shneiderman's 5 criteria for measuring usability:
  - Time to learn
  - Speed of UI performance
  - Avoiding user errors
  - Retention of skills
  - Subjective satisfaction

- Accessibility (for example, Section 508*)

* https://www.section508.gov/manage/laws-and-policies/

Non-Functional Testing

- Configuration testing

- Usability Testing

- **Performance testing**

- Scalability testing

- Security testing

- Recoverability testing

- Reliability testing

- Timely responses: compare time needed to complete an action against
  - Time to perform a similar action in previous version of the same program
  - Time to perform the identical action in a similar program

- Load testing: test for performance slow-downs that occur as additional users use the app

- Done through "browser" or directly on the "server"

Non-Functional Testing

- Configuration testing
- Usability Testing
- Performance testing
- **Scalability testing**
- Security testing
- Recoverability testing
- Reliability testing

- Ability to sustain its required number of simultaneous user and/or transactions while maintaining adequate response times to its end users

- Configuration of the server under test is critical
  - (Almost) identical on the test environment and the production environment

- Threshold requirement
  - Based on existing traffic levels

Non-Functional Testing

- Configuration testing

- Usability Testing

- Performance testing

- Scalability testing

- Security testing

- Recoverability testing

- Reliability testing

- Regulate access to information

- Verify user identities

- Encrypt confidential information

- Http POST vs. Http GET

- State maintenance: cookies, server-side sessions

- Forward vs. redirect control connections

Non-Functional Testing

- Configuration testing

- Usability Testing

- Performance testing

- Scalability testing

- Security testing

- **Recoverability testing**

- Reliability testing

Test the rerouting mechanism
- A backup, duplicate, or distributed server to which the traffic is rerouted when the primary server fails

Non-Functional Testing

- Configuration testing

- Usability Testing

- Performance testing

- Scalability testing

- Security testing

- Recoverability testing

- Reliability testing

Evaluate the product's ability to perform its required functions and give responses under stated conditions for specified period of time