Author: Hung Nguyen – hungnv86@gmail.com
Last updated: Feb 7, 2018

This document explains how to reproduce the results presented in the WebTest paper. At any point where the steps are not clear, please let me know.

1. Download required source code
    a. WebTest project: https://github.com/git1997/VarAnalysis/tree/master/WebTest. This is the main project.
    b. Related projects that are required by WebTest project:
        i. featureexprlib_2.9.1-0.3.3_plugin: https://github.com/git1997/VarAnalysis/tree/master/featureexprlib_2.9.1-0.3.3_plugin
        ii. Symex: https://github.com/git1997/VarAnalysis/tree/master/Symex
        iii. SymexUI: https://github.com/git1997/VarAnalysis/tree/master/SymexUI
        iv. WebParsers: https://github.com/git1997/VarAnalysis/tree/master/WebParsers
    c. Download WebTesting workspace (different from the previous one): https://drive.google.com/open?id=0BwnUQwHWAHAWSlg3eUxQN2xISzQ, which includes the following:
        i. quercus-4.0.39 project: Instrumented version of the PHP interpreter quercus, used to create the S-Model and gather test execution information
        ii. Test Cases project: Uses crawljax to generate test cases
2. Install required software
    a. Eclipse for Scala: To run projects in 1a & 1b
        i. Also install PDT (PHP Development Tools) plug-in for this IDE
    b. Eclipse for JavaEE: To run projects in 1c
3. Install web applications
    a. Download a subject system from sourceforge.net
    b. Copy the subject system into quercus-4.0.39/WebContent
    c. Install the system (which might also require setting up a database in advance)
4. Collect test execution information (In Eclipse JavaEE):
    a. Add these statements to PHP entry points in a system: "error_reporting(E_ALL); ini_set("display_errors", 1);" to show errors and warnings. Entry points are PHP pages that HTTP requests are sent to.
    b. In quercus-4.0.39/edu.iastate.webtesting.util.Config.java: Change the value of SUBJECT_SYSTEM and file path constants
    c. In Test Cases / edu.iastate.hungnv.webtesting.GeneratedTestCasesWithCrawljax.java: Change WEBSITE constant, crawling configurations, and add input specifications (based on the provided examples in the code) if necessary
    d. Start the web server to let quercus wait for requests
    e. Run GeneratedTestCasesWithCrawljax to start sending requests

    f. Information about the test runs are collected to a folder specified earlier by Config.java
    g. Manually extract errors during a test run from a PHP log file (e.g., " /Applications/MAMP/logs/php_error.log")---the specific file path may depend on your computer setup. Copy the extracted content into folder Data/[Subject System]/PHP Errors, next to folder Test Cases which contains information in the previous step. Name the file as "php-errors-raw.txt".
5. Compute output universe (In Eclipse Java)
    a. WebTest/edu.iastate.webtesting.util_clone.Config.java: This file should be identical to quercus-4.0.39/edu.iastate.webtesting.util.Config.java
    b. In WebTest/edu.iastate.webtesting.evaluation.Config2.java: Update entry points for subject systems. Entry points are PHP files that symbolic execution will run on.
    c. Run edu.iastate.webtesting.evaluation.RunSymexForProject to generate D-Model for a subject system
    d. The D-Model is stored in SUBJECT_SYSTEM_FOLDER specified by Config2.java
6. Run WebTest/edu.iastate.webtesting.evaluation.Evaluation to generate evaluation results