

CS 6340 - Fall 2016  
Assignment 4 (100 points)  
Due on: 8am EDT, October 3, 2016

**Objective:** The goal of this assignment is to become familiar with Randoop, a popular automated unit test case generation technique that employs a feedback-directed random testing approach.

**Resources:**

1. Randoop Project Page: <http://randoop.github.io/randoop/>
2. Randoop Download Page: <https://github.com/randoop/randoop/releases/tag/v3.0.4>
3. Randoop User Manual: <https://randoop.github.io/randoop/manual/index.html>
4. Randoop Paper: <http://homes.cs.washington.edu/~mernst/pubs/feedback-testgen-icse2007.pdf>

**Setup:** To start this assignment, you need to have the following software installed:

1. JDK 7 or newer, available at <http://www.oracle.com/technetwork/java/javase/downloads/index.html>
2. Randoop jar file available at the Randoop Download Page.

**Problem:** You are provided with two programs graph.zip and geometry.zip with this assignment. Each program contains at least two errors. For each program, perform the following steps:

1. Unzip the zip file containing the program. Each unzipped folder should contain multiple java files that constitute the source code of the program.
2. Run Randoop on the program to generate error-revealing tests. The Randoop user manual provides details on how to run and configure the command-line parameters for Randoop. You should generate tests to uncover at least two errors in the program. Please do not generate or submit regression tests for this assignment.
3. An error-revealing test generated by Randoop can contain many lines that are irrelevant for triggering the error. Minimizing a test means modifying the test to only include lines relevant for triggering the error. Choose any two tests which reveal any different errors in the program and minimize these tests. **Note that minimization refers to the number of lines or statements - we ask that you only remove lines, not modify them.**
4. Fix the two errors discovered by your minimized tests. Fixing the error will require modifying the source code of the program. You should not suppress the error by just tweaking the Randoop command-line parameters. Since no specification for the programs has been provided, we will accept a broad interpretation of what constitutes a “fix”. Use your best judgement.

**Items to Submit:** For each program, submit the following files in a zip archive called <program>.zip:

1. File named command.txt that includes the command-line that you used to run Randoop.
2. All the files like ErrorTest.java generated by running Randoop. **Please do not generate or submit regression tests for these programs.**
3. File named ErrorTestMinimized.java that contains only the two minimized tests.
4. Java source files with the two bugs corrected.