

Automated testing of OpenMRS

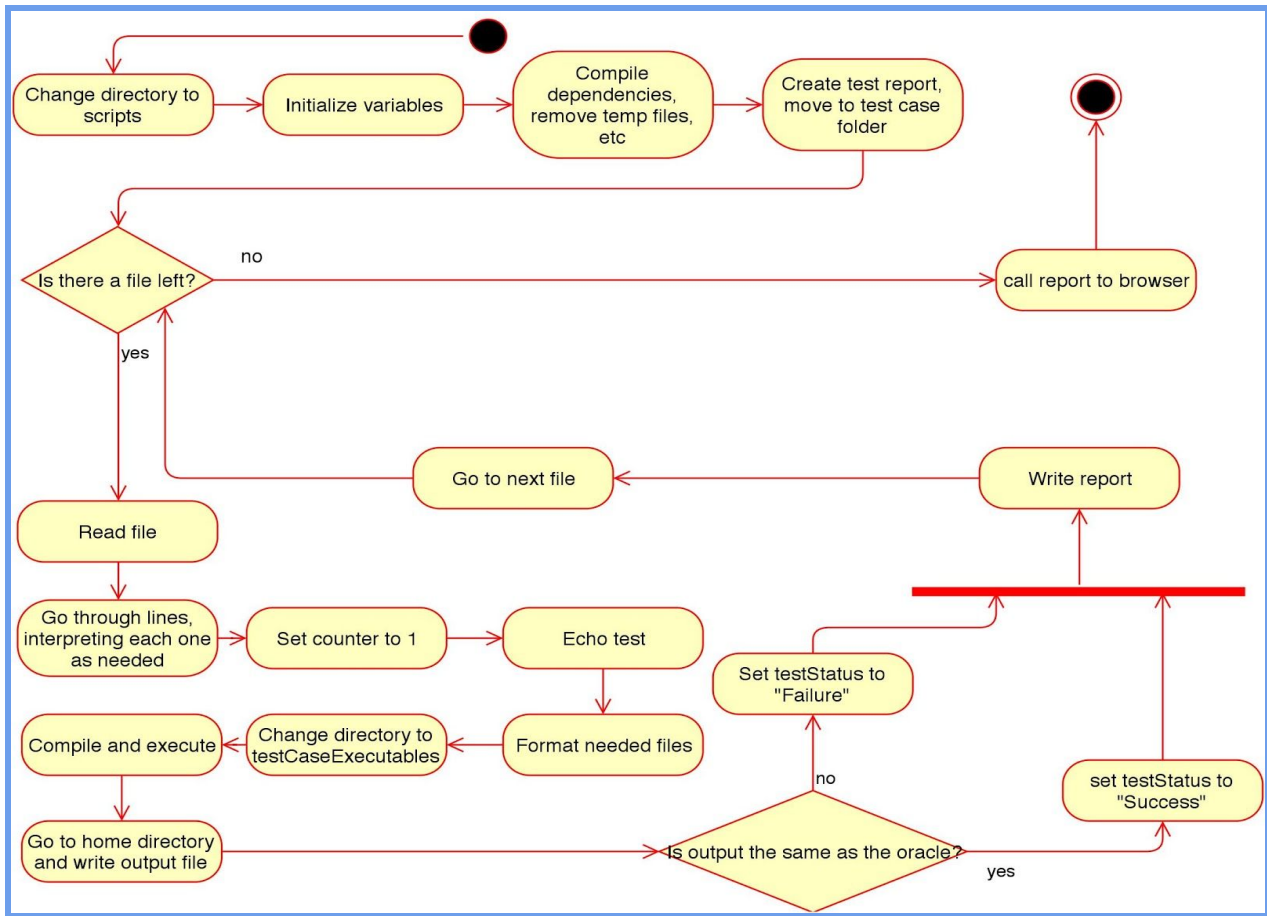
Team6

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OpenMRS is a software system designed to provide users with a free, customizable, electronic medical record system. We chose OpenMRS for our term project because it was well documented and easy to build.



The main part of our project, RunAllTests.sh, is a shell script that runs through each test case, finds the corresponding test files and oracles, checks to see if each test was passed or failed, and displays the collected results on the user’s browser via html.

```
8 lines (8 sloc) | 251 Bytes
1 test16
2 Return true if double is in range and false otherwise, low end is inclusive, high end is exclusive
3 org.openmrs.util
4 boolean contains(double d)
5 DoubleRangeContainsTest
6 org.openmrs.util.DoubleRangeContainsTest
7 -1.0 1.0 0
8 [-1.0 : 1.0).contains(0)
```

We decided to test the DoubleRange and Result classes because their methods allowed us to come up with many different test cases. This meant that we didn’t have to look for test cases in other classes, which was important because other classes often had fewer methods and were more difficult to test.

test1.txt	fixed test case 1	2 days ago
test10.txt	Remaining test cases being done	39 minutes ago
test11.txt	Remaining test cases being done	39 minutes ago
test12.txt	Remaining test cases being done	39 minutes ago
test13.txt	Remaining test cases being done	39 minutes ago
test14.txt	Remaining test cases being done	39 minutes ago
test15.txt	Remaining test cases being done	39 minutes ago
test16.txt	Remaining test cases being done	39 minutes ago
test17.txt	Remaining test cases being done	39 minutes ago
test18.txt	Remaining test cases being done	39 minutes ago
test19.txt	Remaining test cases being done	39 minutes ago
test2.txt	Reworking first 5 test cases	2 days ago
test20.txt	Remaining test cases being done	39 minutes ago
test3.txt	Reworking first 5 test cases	2 days ago
test4.txt	Reworking first 5 test cases	2 days ago
test5.txt	Reworking first 5 test cases	2 days ago
test6.txt	Remaining test cases being done	39 minutes ago
test7.txt	Remaining test cases being done	39 minutes ago
test8.txt	Remaining test cases being done	39 minutes ago
test9.txt	Remaining test cases being done	39 minutes ago

As of now we have 25 tests. The first 10 (test1-test10) deal with the org.openmrs.logic.result component. The next 15 (test11-test25) deal with the org.openmrs.util component. However, only test11-test20 deal with the contains method from the DoubleRange class and only **test11-test15** deal with inclusivity and exclusivity.

```
Testing Range Function for within bounds
OpenMRS Util Component
contains()
DoubleRangeTest
1000.02 9999.1 3000
Success
=====

Test Being Run:
DoubleRangeTest2
Testing Range Function for exclusive upper bound
OpenMRS Util Component
contains()
DoubleRangeTest
1000.02 9999.1 9999.2
Success
=====

Test Being Run:
DoubleRangeTest3
Testing Range Function for exclusive upper bound
OpenMRS Util Component
contains()
DoubleRangeTest
1000.02 9999.1 9999.1
Success
=====
```

When developing our report format, we had little trouble getting the browser display functionality to work, but we had to rework the way the data was arranged. The in-console report display, shown above, was easy to create.

```
Tests run: 4123, Failures: 1, Errors: 0, Skipped: 30
[INFO] Reactor Summary for OpenMRS 2.3.0-SNAPSHOT:
[INFO] OpenMRS ..... SUCCESS [ 0.863 s]
[INFO] openmrs-tools ..... SUCCESS [ 0.527 s]
[INFO] openmrs-test ..... SUCCESS [ 0.023 s]
[INFO] openmrs-api ..... FAILURE [03:34 min]
[INFO] openmrs-web ..... SKIPPED
[INFO] openmrs-webapp ..... SKIPPED
[INFO] BUILD FAILURE
[INFO] Total time: 03:36 min
[INFO] Finished at: 2019-09-11T11:08:35-07:00
[INFO]
[ERROR] Failed to execute goal org.apache.maven.plugins:maven-surefire-plugin:2.19.1:test (default-test) on project openmrs-api: There are test failures.
[ERROR] Please refer to /home/mtsu/repositories/OpenMRS/openmrs-core/api/target/surefire-reports for the individual test results.
[ERROR] -> [Help 1]
[ERROR] To see the full stack trace of the errors, re-run Maven with the -e switch.
[ERROR] Re-run Maven using the -X switch to enable full debug logging.
[ERROR] For more information about the errors and possible solutions, please read the following articles:
[ERROR] [Help 1] http://cwiki.apache.org/confluence/display/MAVEN/MojoFailureException
[ERROR] After correcting the problems, you can resume the build with the command
[ERROR] mvn <goals> -rf :openmrs-api
```

In the course of development, we encountered several challenges and overcame them. When compiling OpenMRS for the first time, we encountered several errors, which we fixed by reverting to a previous version. When we were having difficulty getting a constructor method to work, we discovered the reason was that the method was private, meaning that we couldn’t use the class. This taught us to look for all possible causes of a problem, even if they seem unrelated to the problem.