Non-Regression Test Automation

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Regression Automation

Regression Testing
Selective testing of a system or component to verify that modifications have not caused unintended effects (IEEE 610.12)
Common methods of regression testing include re-running previously run tests and checking whether previously fixed faults have re-emerged (Wikipedia)

Non-Regression Testing
Testing of a system or component to find errors
Running of new tests and checking for new faults
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Why Run Regression Tests

Error fix verification
- One time (assuming error was fixed)
- Easy to look for this error
- 15-60% non-fix rates are common

Error return verification
- Frequently run (assuming error might return)
- Unlikely event

Check for unintended side-effects
- “Regression tests” already exist
- But, any test will do

Manual Versus Automated Regression Tests

Repeats the same exercise
- Does exactly the same thing the same way
- Already explored territory

Automation reduces variability
- Sometimes a good thing
- Not so good for finding new failures
- Limits what you can do

You should look elsewhere for new failures
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Tests That Require Automation

- Buffer overruns (huge sizes, long runs)
- Non-boundary special cases (large number of tests)
- Memory leaks, stack overflows (long series)
- Memory or stack corruption (in memory)
- Resource consumption/exhaustion
- Timing errors (windows of opportunity)

Non-Regression Automation Examples

- Data driven / data configured
- Model based
- Random walks
- Function equivalence
- A/B Comparison
- Statistical models
- Real-time external monitors
- Cooperating processes
- Duration, life, load testing
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Pseudo Random Numbers

Used for selection or construction of inputs
  • With and without weighting factors
  • Selection with and without replacement

Statistically “random” sequence

Randomly generated “seed” value

Requires oracles to be useful

Test Case Styles

• Data-driven commercial program
• Real-time monitoring utility
• Driver/stub combination
• Configurable or data-driven custom program
• Individual program/test
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**Program Touch-Points**

- Public API
- GUI API
- Non-GUI API
- Individual program/tests
- Trusted objects

**Test Oracles**

- Reference functions
- Computational or logical modeling
- Heuristic functions
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What Automation Can’t Do (Yet)

• Know all expected results
• Notice things we haven’t thought of
• Internal boundary analysis
• Decide new courses of action

Conclusions

• Regression vs. non-regression tests
• Automation of regression tests
• Alternatives to regression automation
• Many styles, approaches, techniques
• Key enabler is the oracle
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Regression Test Or Demo Script

- Conceive and create an exercise
- Run it and inspect the results
- If error – report problem
- If works, record the steps and results
- Stick closely to the script when rerun