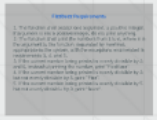
CS1699 - Lecture 4 - Test Plans



Developing a Test Plan

So you have requirements...

how do you test them?

Think About What You're Testing

1. Throw-away script?
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3. Internal website?
4. Enterprise software?
5. Operating system?
6. Avionics software?

Your test plan should flow from the functional requirements through the non-functional requirements.

Example

System shall fail gracefully.

This will mean something very different for an MRI machine and a website.

The Seven Testing Principles

1. Testing shows presence of defects.
2. Exhaustive testing is impossible.
3. Test early.
4. Defects cluster.
5. Avoid the "pesticide paradox".
6. Testing is context dependent.
7. Absence of errors fallacy.

- ISTQB (International Software Quality Testing Board Foundational Syllabus)

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How much you test
What tools you use
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Let's say we gave a fully tested and vetted FizzBuzz regression solution to a customer.

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Test Cases / Runs / Plans / Suites

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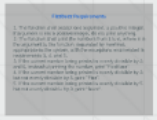

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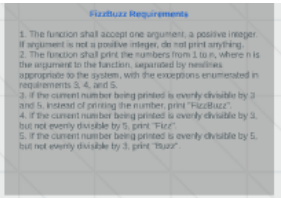
FizzBuzz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Test Cases / Runs / Plans / Suites

Test Cases

A test case is the lowest level of a test plan.
It consists of:
1. Input values
2. Preconditions
3. Execution steps (or Procedure)
4. Output values
5. Postconditions

See IEEE 829, "Standard for Software Test Documentation", for more details

Example

Assuming an empty shopping cart, when I click "Buy Widget", the number of widgets in the shopping cart becomes one.

Preconditions: Empty shopping cart
Execution Steps: Click "Buy Widget"
Postconditions: Shopping cart displays one widget

Example

Assuming that the SORT_ASCENDING flag is set, calling the sort method with [9,3,4,2] will return a new array sorted from high to low, i.e., [2,3,4,9].

Precondition: SORT_ASCENDING flag is set
Input values: [9,3,4,2]
Execution steps: Call .sort method
Output values: [2,3,4,9]

Test Plan

A group of test cases makes up a test plan. These are usually associated functionally or in other ways.

Examples:
Database Connectivity Test Plan
Pop-up Warning Test Plan
Calculator Subsystem Test Plan
Pressure Safety Lock Test Plan
Regression Test Plan

Pressure Safety Lock Test Plan

LOW-PRESSURE-TEST
HIGH-PRESSURE-TEST
SAFETY-LIGHT-TEST
SAFETY-LIGHT-OFF-TEST-
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RESET-SWITCH2-TEST
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SENSOR-FAILURE-TEST
SENSOR-INVALID-TEST

A Group of Test Plans is a Test Suite

Regression Test Suite

Pressure Safety Regression Test Plan
Power Regulation Regression Test Plan
Water Flow Regression Test Plan
Control Flow Test Plan
Security Regression Test Plan
Secondary Safety Process Test Plan

Test Run

The actual execution of a test plan or suite.

During this execution, the status of each test case is recorded. Possible statuses include:

PASSED FAILED PAUSED
RUNNING BLOCKED ERROR

PASSED - The test case met all postconditions and expected values. No other problems were observed (e.g., test met all postconditions, but screen turned fuchsia afterwards).

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Note that this need not be official; if you're doing preliminary testing, it may be sufficient to just talk to the developer.

Developing A Test Plan or Suite

Start top-down: what is a good way to subdivide the system into features (test plans)?

For a given feature (test plan), what aspects do I want to test?

For each aspect, what test cases do I want that will hit different equivalence classes / success or failure cases / edge or corner cases / etc.? How deep should I go down?

Try to have test cases be independent of each other, and reproducible!

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Argument: 20

1
2
Fizz
4
Buzz
Fizz
7
8
Fizz
Buzz
11
Fizz
13
14
FizzBuzz
16

Example Output

Let's Come up with a Test Plan!

Equivalence Classes?
Boundary Values?
Base case?
Success vs Failure Cases?
Edge cases, Corner/Pathological cases?

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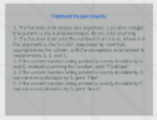

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