

Homework 1

1. Problem 1

- a. Testing is context dependent – the engineer tried to utilize their understanding of testing in a safety-critical environment to testing in an environment where safety is definitely not a critical thing to consider: a web app.
- b. Beware of the pesticide paradox – when introducing new features/updates to an existing piece of software, you must add/update your tests as well. The same “comprehensive suite of automated tests” that the organization ran for each update will not always work if new defects are introduced that cannot be covered by those tests.
- c. Early testing saves money and time – the team waited until one of the later stages of the waterfall process before testing their software. And as we know from the cost of testing curve, the longer you wait until testing is done the more it’s going to cost at an exponential rate.
- d. Absence-of-errors is a fallacy – The manager fell into the belief that his software was “defect free”, which principles 1 and 2 tell us is impossible. Firstly, we’ll only see defects and not their absence, and secondly exhaustive testing where every possible scenario is covered is impossible.

2. Problem 2

a. Input Pairings

- i. (6, A): A test basis includes the actual implementation of the component/system (i.e., the code), and the test basis is needed during analysis.
- ii. (3, A): A test basis also includes requirements specification such as business/functional requirements and user stories/epics/cases.⁷
- iii. (5, B): Through design, we can answer the question “how to test” by understanding the inputs and expected outputs of a test condition.
- iv. (4, C): Test implementation specifies procedures which are a culmination of multiple test cases in execution order.
- v. (4, D): Test Cases are needed before any execution of them can be done
- vi. (6, D): The actual source code is required before any tests can be executed which will go through that code.
- vii. (2, E): We are able to monitor test progress only after tests are actually executed, which produce results and logs that we can look at
- viii. (3, F): Before making any plans to testing, we need to know what the requirements are of the system in order to understand the objectives of testing.

b. Output Pairings

- i. (A, 5): Through analysis, the test basis is identified and used to determine “what to test”, which is then used to create conditions.
- ii. (A, 1): The test basis also includes information about defects found, which is useful in the creation of a Defect Report
- iii. (B, 4): Through a test condition created from a design, we can elaborate upon it via the creation of actual test cases.
- iv. (D, 1): By executing a test, we can find any defects through failures which are useful to add in a Defect Report.
- v. (D, 2): By executing a test, we can achieve the result (pass/fail) as well as log any anomalies found
- vi. (E, 4): Through monitoring of test results, we can determine if the tests were adequate or if more test cases need to be created.
- vii. (F, 3): In a TDD environment, planning for tests can be useful in the actual creation of the code/system.

c. Testwares

- i. Test cases, Test Conditions, Test Results and Logs, Defect Reports

3. Problem 3

Input	Expected Output	Purpose
Example (1, 1, 1)	Equilateral	Triangle is an equilateral
(1, 1, 2)	Isosceles	Triangle is an isosceles
(1, 2, 3)	Scalene	Triangle is a scalene
(1, 1)	ERROR: Not enough inputs	Less than the required 3 inputs
(1, 1, 1, 1)	ERROR: Too many inputs	More than the required 3 inputs
(1, 1, null)	ERROR: Null input	One or more of the inputs is null
(1, 1, a)	ERROR: Non integer input	One or more of the inputs is not an integer
(1, 1, “a”)	ERROR: Non integer input	One or more of the inputs is not an integer
(1, 1, 1.1)	ERROR: Non integer input	One or more of the inputs is not an integer
(0, 1, 1)	ERROR: Input value too small	One or more of the inputs is less than the minimum required integer value of 1
(201, 1, 1)	ERROR: Input value too large	One or more of the inputs is more than the maximum required integer value of 200