Activity: Coverage-Based Test Design

CS 3250
Software Testing
Coverage Criteria in Action

Test design (You have 5 minutes to complete this task)

• Form a team of 7-8, each team gets two bags of candies

• Examine **bag #1**

• Imagine you are conducting a “candy testing” – Yes, imagine, don’t eat yet .. You will execute your tests later

• Discuss in your team, use the worksheet (pages 1-2)
  
  • Come up with one criterion to test the candy
    (example, C = taste one candy of each texture)

  • Derive a set of test requirements
    (example, TR = {hard, soft}, where tr1 = hard, tr2 = soft)

  • Design a minimal set of test cases
    (example, T = {two sweet tarts, one sour patch}, where t1 = two sweet tarts, t2 = one sour patch)
    *assuming two sweet tarts are consumed at once – what if one is consumed at a time?*
Coverage Criteria in Action (2)

Coverage Level of your tests (2-3 minutes)

• Discuss in your team, analyze the coverage level of your test set
  • Given a set of test requirements derived from your test criterion
  • How many requirements are satisfied by a set of test cases

• Use the worksheet (page 3, question 6):
  • Record which test requirements are satisfied by your test set
  • Compute the coverage level
Coverage Criteria in Action (3)

Test execution and evaluation (3-4 minutes)

- Execute your tests against bag #1
  - You will now transform yourself into a “human-PUT”
  - For each test case, the “human-PUT”
    - Takes input (candy)
    - Performs a “consume” operation
  - Expected output: normal behavior, “human-PUT” does not crash

- Evaluate your tests, use the worksheet (page 3, question 7)
  - Document the number of failed test cases
    - Given a test case, expected output ≠ actual output
  - Document the number of test cases that are infeasible
    - Given a test case, the test cannot be executed
Coverage Criteria in Action (4)

Coverage Level of another team’s tests (5 minutes)

• Trade your set of test cases with another team

• Discuss in your team, analyze the coverage level of their tests
  • Given the set of test requirements derived from your test criterion
  • How many requirements are satisfied by their set of test cases

• Use the worksheet (page 3, question 8):
  • Record which test requirements are satisfied by their test set
  • Compute the coverage level
Coverage Criteria in Action (5)

Test execution and evaluation (3-4 minutes)

- Execute another team’s tests against bag #2
  - You will now transform yourself into a “human-PUT”
  - For each test case, the “human-PUT”
    - Takes input (candy)
    - Performs a “consume” operation
  - Expected output: normal behavior, “human-PUT” does not crash

- Evaluate the tests, use the worksheet (pages 3-4, questions 9)
  - Document the number of failed test cases
    - Given a test case, expected output ≠ actual output
  - Document the number of test cases that are infeasible
    - Given a test case, the test cannot be executed
Wrap-up Questions

• Use the worksheet (page 4)

• Is your criterion appropriate? Justify, why?

• [Additional thought questions]
  • How were test requirements derived?
  • How were test cases designed?

• Is there redundancy in the test set?

• Given your criterion, consider the coverage levels of your test set and another team’s test set. Are they different? What does it mean if one is higher than another?