
A test that reveals a bug has succeeded, not failed. —Boris Beizer

PLEASE PRINT ALL PARTICIPANT NAMES ON TOP OF THE PAGE

Class, Section _____

Total Points (Out of 100 points) _____

Instruction:

1. Answer to the problem on a **PDF** file (**PDF file only**) and save it as HW#_YOUR-Team#.PDF
 2. Submit the **PDF** file to eLearning before the due date
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1. (30 points) The following set of edges defines a graph:

- $E = \{ (1, 2), (1, 3), (1, 4), (2, 7), (3, 2), (3, 4), (3, 5), (3, 6), (4, 7), (5, 2), (5, 7), (6, 4), (6, 7), (7, 8), (7, 9) \}$
- $N_0 = \{ 1 \}$
- $N_f = \{ 8, 9 \}$

Use this graph to answer the following questions:

- a. (5 points) Draw the graph. Be sure to annotate the initial and final nodes correctly.
 - b. (2 points) Is the sequence [1, 3, 6, 4, 7, 9] a Test Path?
 - c. (2 points) Is the sequence [1, 3, 2, 7] a Test Path?
 - d. (2 points) Is the sequence [1, 2, 4, 7, 9] a Test Path?
 - e. (3 points) What is the reach set for node 4?
 - f. (3 points) What is the length of the shortest test path?
 - g. (3 points) Does the Test Path [1, 3, 6, 7, 9] tour subpath [6, 4, 7, 9]?
 - h. (5 points) Give the test requirements for edge-pair coverage.
 - i. (5 points) Give the test requirements for prime path coverage
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2. (60 points) (Ch7- Exercises #7 of Section 7.3) Use the method printPrimes() for questions a–f below.
 - a. (10 points) Draw the control flow graph for the printPrimes() method.
 - b. (10 points) Consider test cases $t_1 = (n = 3)$ and $t_2 = (n = 5)$. Although these tour the same prime paths in printPrimes(), they do not necessarily find the same faults. Design a simple fault that t_2 would be more likely to discover than t_1 would.
 - c. (10 points) For printPrimes(), find a test case such that the corresponding test path visits the edge that connects the beginning of the **while** statement to the *for* statement without going through the body of the **while** loop.
 - d. (10 points) List the test requirements for Node Coverage, Edge Coverage, and Prime Path Coverage.
 - e. (10 points) List test paths that achieve Node Coverage but not Edge Coverage on the graph.
 - f. (10 points) List test paths that achieve Edge Coverage but not Prime Path Coverage on the graph.
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Remember to describe who did what (10 points)