

CS 3250: Software Testing (Fall 2025)

POTD 3: Graph coverage criteria

Due 2-Oct-2025, 11:00am EST

Purpose: Understand the basic concept of graph and apply graph coverage criteria

You may make a copy of a worksheet and complete this activity, or type your answers in any text editor.
You may work alone or with at most two other students in this course

Consider the following graph and test paths

$N = \{ 1, 2, 3, 4, 5, 6, 7, 8 \}$

$N_0 = \{ 1 \}$

$N_f = \{ 8 \}$

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

Test paths

$t_1 = [1, 2, 8]$

$t_2 = [1, 2, 3, 5, 7, 2, 8]$

$t_3 = [1, 2, 3, 5, 6, 7, 2, 8]$

$t_4 = [1, 2, 3, 4, 3, 5, 7, 2, 8]$

$t_5 = [1, 2, 3, 4, 3, 4, 3, 5, 6, 7, 2, 8]$

$t_6 = [1, 2, 3, 4, 3, 5, 7, 2, 3, 5, 6, 7, 2, 8]$

1. Draw the graph (You may draw the graph by hand, take a screenshot of your graph, and embed it in your write-up)
2. Use the given test paths, list a **minimal set of test paths** that achieve **Node** coverage
3. Use the given test paths, list a **minimal set of test paths** that achieve **Edge** coverage

4. Does the given set of test paths satisfy Node Coverage? If not, what is missing?
5. Does the given set of test paths satisfy Edge Coverage? If not, what is missing?
6. *[optional]* List the **test requirements** for **Edge-Pair** Coverage (hint: you should get 14 requirements of length 2) and then list a **minimal set of test paths** that achieve Edge-Pair coverage
7. *[optional]* Does the given set of test paths satisfy Edge-Pair Coverage? If not, what is missing?
8. *[optional]* If, instead, the given test path t_6 is $[1, 2, 3, 4, 3, 5, 6, 7, 2, 8]$, does the given set of test paths satisfy Edge-Pair Coverage? If not, what is missing?

Grading rubric

[Total: 10 points]: Done (or provide evidence of your attempt, full or reasonable effort)

- (5 points) — Providing evidence of your attempt, minimal effort
- (-2.5 points) for 24 hours late (submitted after 2-Oct-2025 11am EST, by 3-Oct-2025 11am EST)
(-5 points) for 48 hours late (submitted after 3-Oct-2025 11am EST, by 4-Oct-2025 11am EST)

Submission

- Save your report as a .pdf file
- Log in to Canvas, then upload your report (.pdf) to **POTD 3 on Gradescope**.
- Connect your partner to your group on Gradescope so that everyone receives credit
- Each team submits only **one** copy

Making your submission available to instructor and course staff is **your** responsibility; if we cannot access or open your file, you will not get credit. Be sure to test access to your file before the due date.

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