# Lecture 13 - In Class Exercise

**Goal:** Get familiar working with def-use terms and analysis.

## 1   Def Use Coverage

*Instructions:* Work with your neighbors in groups of 2.

Consider the following graph and test paths:

```
N  = { 1, 2, 3, 4, 5, 6, 7, 8 }
N0 = { 1 }
Nf = { 8 }
E  = { (1, 2), (2, 3) (2, 8), (3, 4), (3, 5), (4, 3), (5, 6) (5, 7), (6, 7), (7, 2) }
def(1) = def(4) = use(6) = use(8) = { x }

Test paths:
t1 = [1, 2, 8]
t2 = [1, 2, 3, 5, 7, 2, 8]
t3 = [1, 2, 3, 5, 6, 7, 2, 8]
t4 = [1, 2, 3, 4, 3, 5, 7, 2, 8]
t5 = [1, 2, 3, 4, 3, 4, 3, 5, 6, 7, 2, 8]
t6 = [1, 2, 3, 4, 3, 5, 7, 2, 3, 5, 6, 7, 2, 8]
```

Based on the graph above, answer the following questions:

1. Draw the graph

2. List all of the du-paths with respect to x. (Note: Include all-du-paths, even those that are subpaths of some other du-path).

3. Determine which du-paths each test path tours. Write them in a table with test paths in the first column and the du-paths they cover in the second column. For this part of the exercise, you should consider both direct touring and sidetrips.

4. List a minimal test set that satisfies all defs coverage with respect to x. (Direct tours only.) Use the given test paths.

5. List a minimal test set that satisfies all uses coverage with respect to x. (Direct tours only.) Use the given test paths.

6. List a minimal test set that satisfies all-du-paths coverage with respect to x. (Direct tours only.) Use the given test paths.