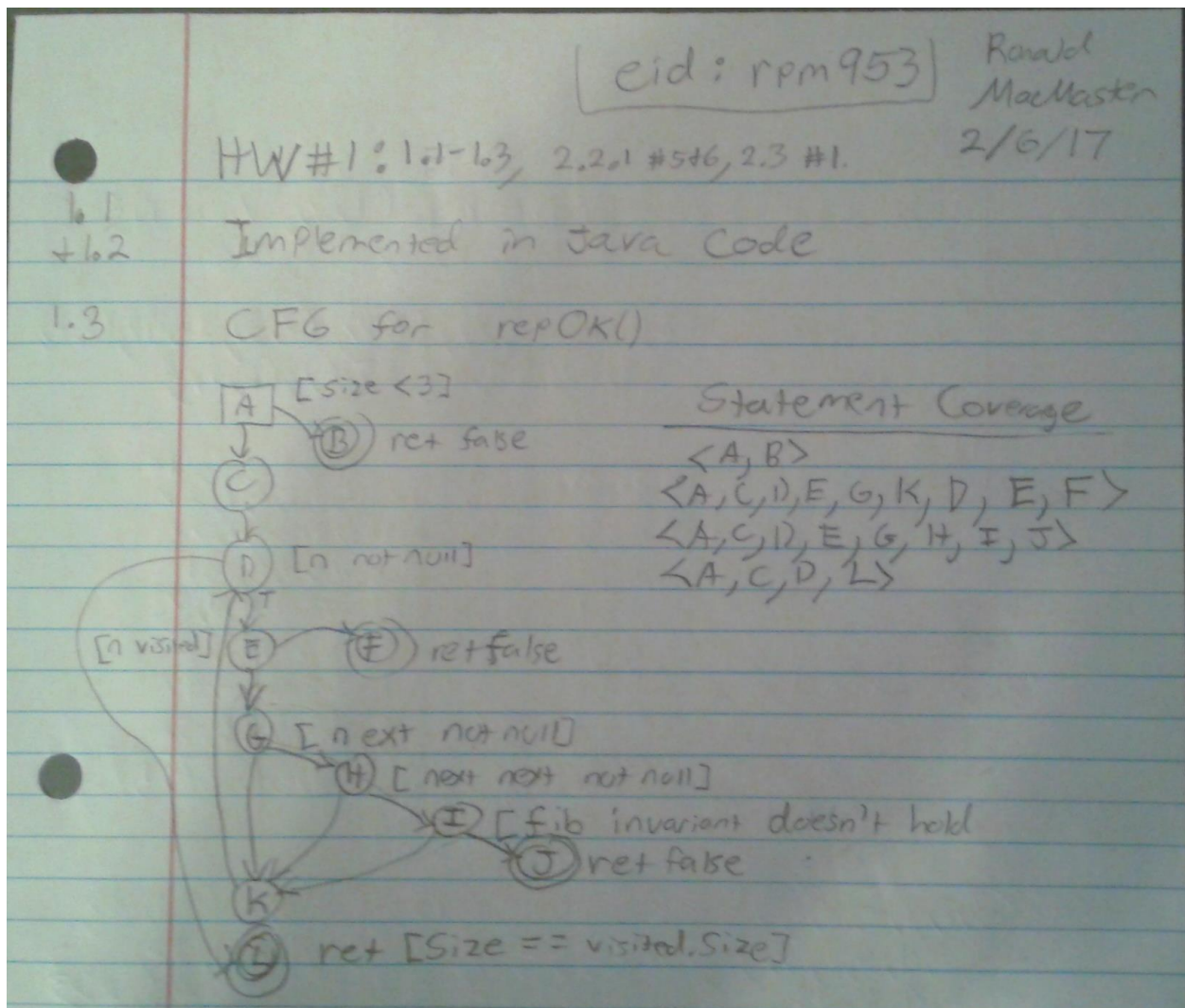


Software Testing HW 1

Sections 1.1, 1.2, and 1.3:

1.1, 1.2 and 1.3 are implemented in the .java files.



Section 2.2.1

Question #5: a-e on this page. f & g on next page.

20201
5. a.

$\langle 1 \rangle = \text{Visit path } P.$

b. $\{ \langle 1, 2, 3 \rangle, \langle 1, 2, 4 \rangle, \langle 2, 3, 2 \rangle, \langle 2, 4, 5 \rangle, \langle 3, 4, 6 \rangle, \langle 3, 2, 4 \rangle, \langle 4, 5, 6 \rangle, \langle 4, 6, 1 \rangle, \langle 5, 6, 1 \rangle, \langle 6, 1, 7 \rangle, \langle 6, 1, 2 \rangle, \langle 3, 2, 3 \rangle \}$

c. Nope, test requirements $\langle 3, 2, 3 \rangle$ and $\langle 6, 1, 2 \rangle$ are not satisfied.

d. There is a side trip: $\langle 4, 6, 1, 2, 4 \rangle$.

e-g on back

e. node coverage: $\{ \forall n \in \text{range}(1, 7), \text{visit } n \}$
 $\{ 1, 2, 3, 4, 5, 6, 7 \}$

edge coverage: $\{ \text{visit: } (1, 2), (1, 7), (2, 3), (2, 4), (3, 2), (4, 5), (4, 6), (5, 6), (6, 1) \}$

Find:

Prime Paths

1	1, 2	1, 2, 3	1, 2, 3, 2 X	1, 2, 4, 5, 6	1, 2, 4, 5, 6, 1 X
2	1, 7	1, 2, 4	1, 2, 4, 5	1, 2, 4, 6, 1 X	2, 4, 5, 6, 1, 2 X
3	2, 3	2, 3, 2 X	1, 2, 4, 6	2, 4, 5, 6, 1	2, 4, 5, 6, 1, 7 !
4	2, 4	2, 4, 5	2, 4, 5, 6	2, 4, 6, 1, 2 X	3, 2, 4, 5, 6, 1
5	3, 2	2, 4, 6	2, 4, 6, 1	2, 4, 6, 1, 7 !	3, 2, 4, 6, 1, 7 !
6	4, 5	3, 2, 3 X	3, 2, 4, 5	3, 2, 4, 5, 6	4, 5, 6, 1, 2, 3
7	4, 6	3, 2, 4	3, 2, 4, 6	3, 2, 4, 6, 1	4, 5, 6, 1, 2, 4 X
	5, 6	4, 5, 6	4, 5, 6, 1	4, 5, 6, 1, 2	5, 6, 1, 2, 4, 5 X
	6, 1	4, 6, 1	4, 6, 1, 2	4, 5, 6, 1, 7 !	3, 2, 4, 5, 6, 1, 7 !
		5, 6, 1	4, 6, 1, 7 !	5, 6, 1, 2, 3	
		6, 1, 7 !	5, 6, 1, 2	5, 6, 1, 2, 4	
			5, 6, 1, 7 !		

Prime Path coverage:

$\{ \langle 3, 2, 4, 5, 6, 1, 7 \rangle, \langle 1, 2, 4, 5, 6, 1 \rangle, \langle 2, 4, 5, 6, 1, 2 \rangle, \langle 3, 2, 4, 6, 1, 7 \rangle, \langle 4, 5, 6, 1, 2, 4 \rangle, \langle 5, 6, 1, 2, 4, 5 \rangle, \langle 1, 2, 4, 6, 1 \rangle, \langle 2, 4, 6, 1, 2 \rangle, \langle 3, 2, 3 \rangle, \langle 2, 3, 2 \rangle \}$

$$f. T = \{ \langle 1, 2, 3, 2, 4, 5, 6, 1, 7 \rangle \}$$

(misses edge (4,6))

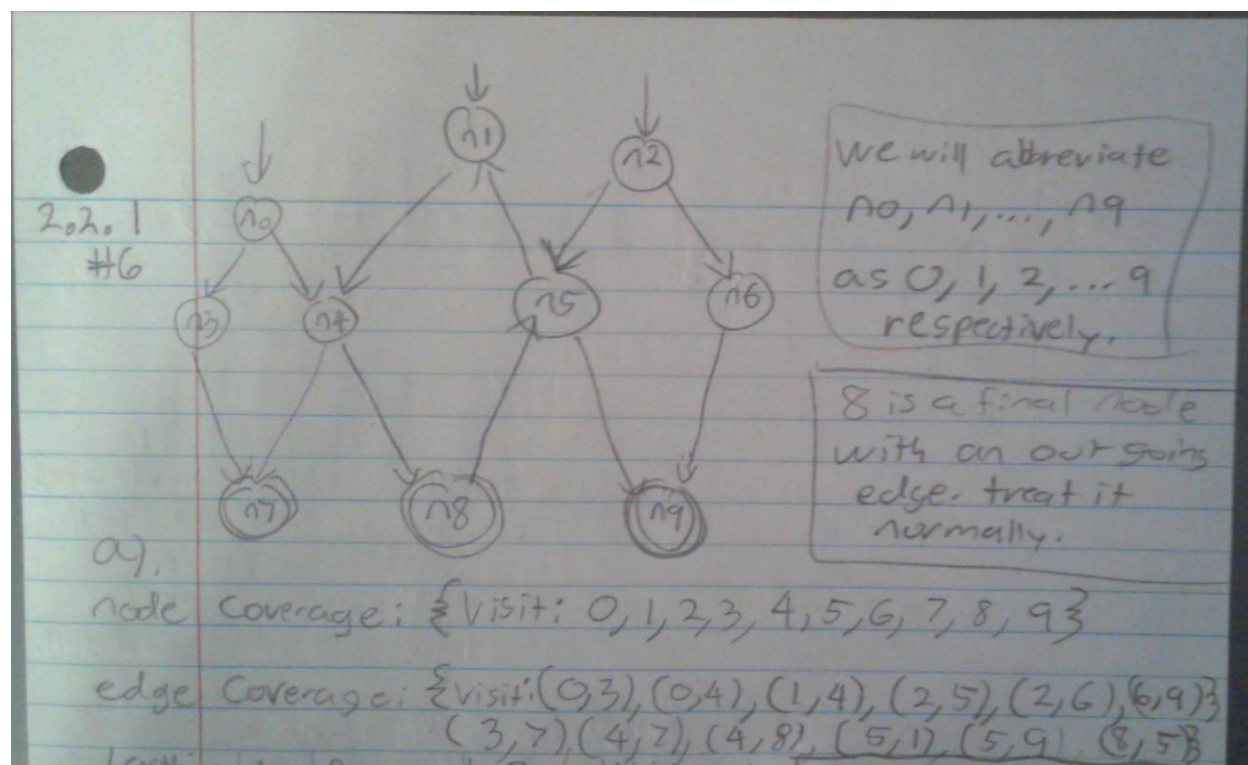
$$g. T = \{ \langle 1, 2, 3, 2, 4, 5, 6, 1, 7 \rangle \}$$

$$\langle 1, 2, 4, 6, 1, 7 \rangle$$

misses print path

$$\langle 3, 2, 3 \rangle.$$

Question #6:



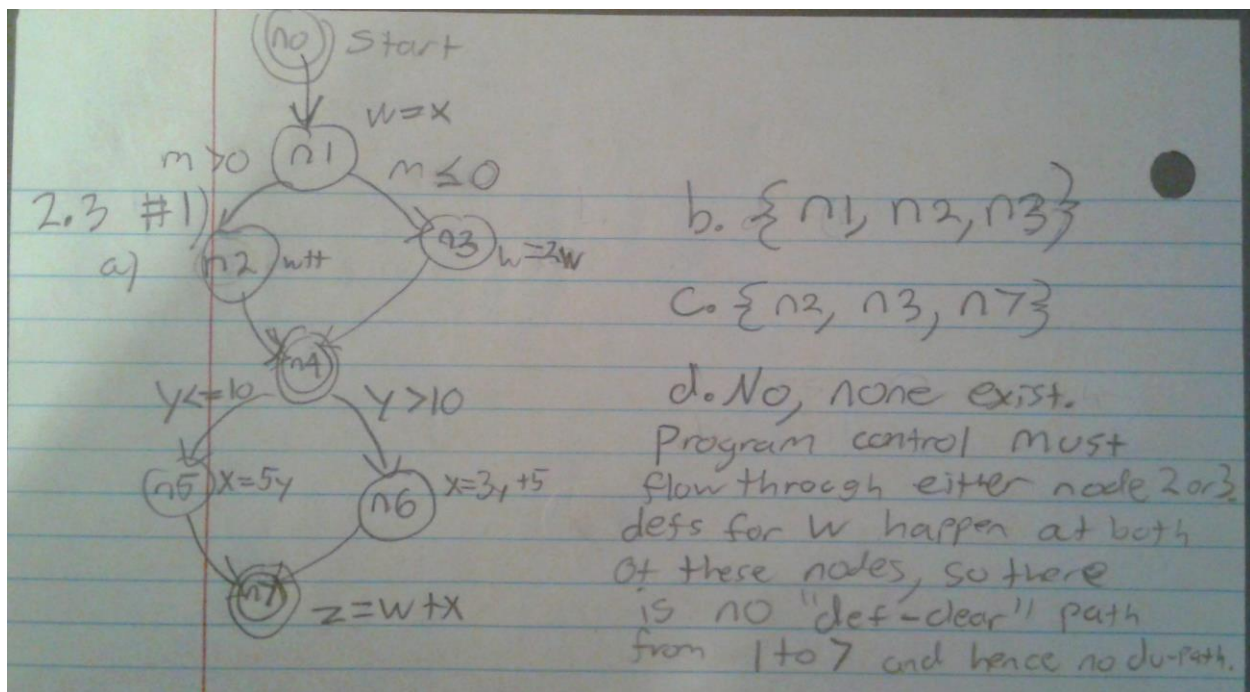
Length:	0	1	2	3	len 4 cont.	Prime Path Coverage
Find	1	0,3	0,3,7!	0,4,8,5	5,1,4,8,5*	$\{ \langle 8,5,1,4,8 \rangle, \langle 8,5,1,4,7 \rangle \}$
Prime Paths	2	0,4	0,4,7!	1,4,8,5	8,5,1,4,7!	$\{ \langle 5,1,4,8,5 \rangle, \langle 2,5,1,4,8 \rangle \}$
	3	1,4	0,4,8	2,5,1,4	8,5,1,4,8*	$\{ \langle 2,5,1,4,7 \rangle, \langle 1,4,8,5,1 \rangle \}$
	4	2,5	1,4,7!	5,1,4,7	4,8,5,1,4	$\{ \langle 1,4,8,5,9 \rangle, \langle 0,4,8,5,1 \rangle \}$
	5	3,7!	1,4,8	5,1,4,8		$\{ \langle 0,4,8,5,9 \rangle, \langle 4,8,5,1,4 \rangle \}$
	6	4,7!	2,5,1	8,5,1,4		$\{ \langle 2,6,9 \rangle, \langle 3,5,9 \rangle, \langle 0,4,7 \rangle \}$
	7	4,8	2,5,9!	4,8,5,1		$\{ \langle 0,3,7 \rangle \}$
	8	5,1	2,6,9!	0,4,8,5,9!		
	9	5,9!	5,1,4	1,4,8,5,9!		
		6,9!	8,5,9!	2,5,1,4,7!		
		8,5	4,8,5	2,5,1,4,8!		

b) $T = \{ \langle 0,3,7 \rangle, \langle 1,4,8,5,9 \rangle, \langle 2,6,9 \rangle \}$
SKIPS $(0,4)$ and $(4,7)$

c) $T = \{ \langle 0,3,7 \rangle, \langle 0,4,7 \rangle, \langle 2,5,1,4,8,5,9 \rangle, \langle 2,6,9 \rangle \}$
SKIPS the simple loop: $\langle 8,5,1,4,8 \rangle$.

Section 2.3

Question #1:



e. Variable W : $\{ \langle n1, n2 \rangle, \langle n1, n3 \rangle, \langle n2, n4, n5, n7 \rangle, \langle n2, n4, n6, n7 \rangle, \langle n3, n4, n5, n7 \rangle, \langle n3, n4, n6, n7 \rangle \}$

Variable X : $\{ \langle n0, n1 \rangle, \langle n5, n7 \rangle, \langle n6, n7 \rangle \}$ (X is defined at start)
 X is defined at start as program input ($n0$)