Due Date : 21/11/2023 at 23.55
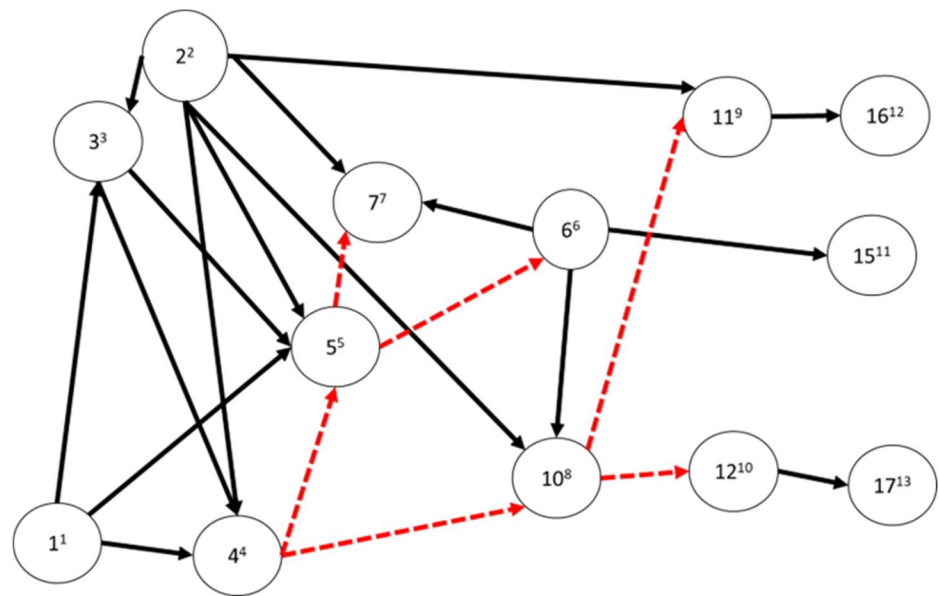
Question #1

Given is the following program   Dynamic PDG

```
1. cin >> a;
2. cin >> b;
3. c= a+b;
4. if (a> (b-c))
   {
5.       if (b == (c-a))
         {
6.               c=2;
7.               a=b+c;
         }
8.       else
         {
9.               a=3;
         }
10.      if (c < b)
         {
11.        b++;
12.        a=3
         }
13.      else
         {
14.        b=0;
         }
   }
15. cout << c;
16. cout << b;
17. cout << a;
```


a.) Create a dynamic PDG and compute a dynamic backward slice for S (c,15,last execution position), given the following input: Initial input: a= 2; b = 3

Execution trace: 1^1, 2^2, 3^3,4^4,5^5,6^6,7^7, 10^8,11^9,12^{10},15^{11},16^{12},17^{13}

Dynamic PDG shown on the top

Slice $S(c,15^{11})$ = (1,2,3,4,5,6,15)

b.) Compute dynamic forward slices for the given the following input: initial input: a= 2; b = 3.
Calculate the slices for all variables until the end of the program. Make sure you show all the
steps at each execution position - like what we did during the lecture.

	A	B	C
1. CIN>>A;	1		
2. CIN >>B;	1	2	
3. C = A+B	1	2	1,2,3
4. IF (A>(B-C)) {	1,2,3,4	1,2,3,4	1,2,3,4
5. IF (B ==(C-A)) {	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5
6. C=2;	1,2,3,4,5	1,2,3,4,5	6
7. A=B+C;	1,2,3,4,5,6,7	1,2,3,4,5	6
}			
	1,2,3,4,5,6,7	1,2,3,4	6
10. IF (C<B){	1,2,3,4,5,6,7,10	1,2,3,4,6,10	1,2,3,4,6,10
11. B++;	1,2,3,4,5,6,7,10	1,2,3,4,6,10,11	1,2,3,4,6,10
12. A=3;	12	1,2,3,4,6,10,11	1,2,3,4,6,10
}	12	1,2,3,4,6,10,11	6
}	12	1,2,3,4,6,10,11	6
15. COUT <<C;	12	1,2,3,4,6,10,11	6
16. COUT <<B;	12	1,2,3,4,6,10,11	6
17. COUT <<A;	12	1,2,3,4,6,10,11	6

Question #2

You have started a new position as a software maintainer. At your first department meeting your new boss is making the following announcement. "I am excited to announce that we are replacing our traditional regression testing approach with a profile based regression testing approach, which not only reduces the number of regression tests which we have to perform but also is safe.

Do you agree/disagree with this statement? Briefly justify your answer.

Disagree, while the profile based regression testing approach does reduce the number of regression test, it is not considered safe. Profile based regression testing might omit some test cases which might reveal regression faults.