Assignement #4

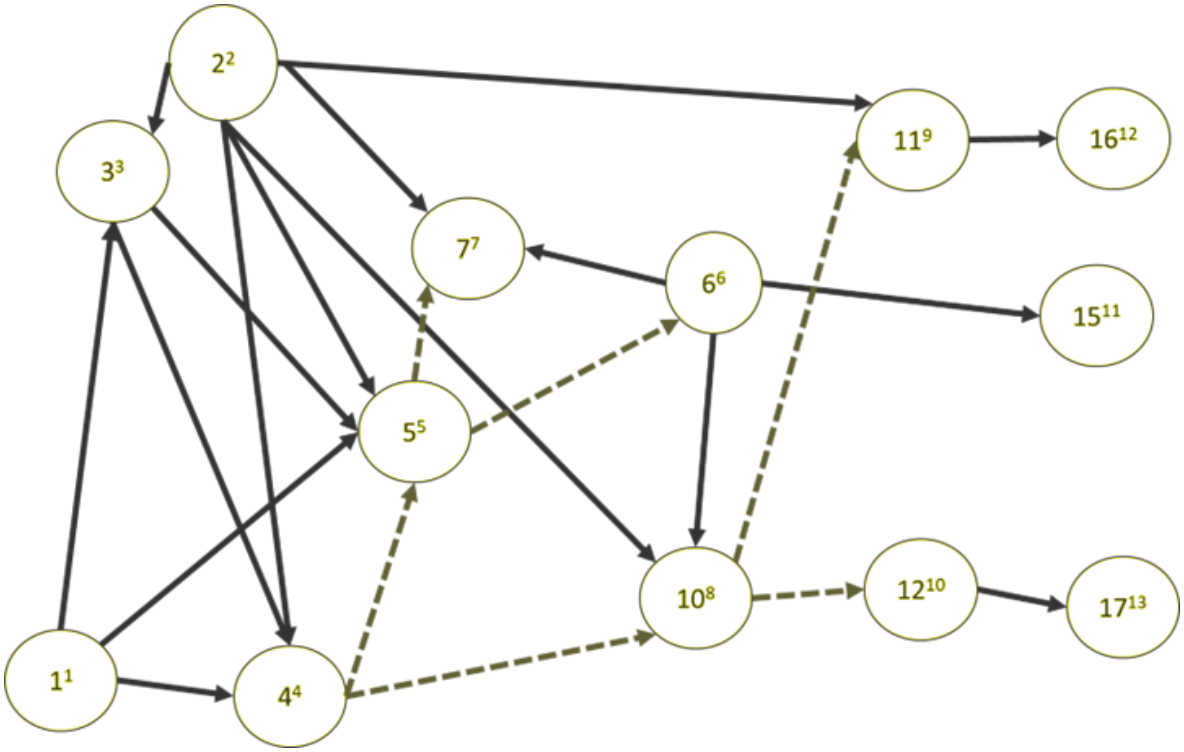
Due Date : 21/11/2023 at 23.55

Question #1

Given is the following program and initial input: a= 2; b = 3.

```
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.

Agree: The profile-based regression testing approach offers advantages in terms of efficiency, reduced test load, and focused risk mitigation. It can streamline testing efforts by targeting specific profiles impacted by changes, potentially saving time and resources. However, careful consideration is needed to ensure that critical scenarios and interdependencies are adequately addressed.