**A-5: Static Single Assignment**

**Question 1:**

Dou you notice that each usage of local variable as an operand user a suffix that can be tracked to it’s assignment? Why do some variables have a suffix ‘(D)’?

**Answer:**

Suffix of local variables represents the assignment. Suffix of local variables are unique numbers. The variables which are used before any assignment are suffixed with ‘(D)’ to indicate that the assignment was implicit in the declaration.

e.g.

‘d\_3’ represents the usage of variable ‘d’ before assignment.

**Question 2:**

Find the point in the CFG in which the paths of the two assignments to variable ‘a’ and ‘b’ merge. You will notice that PHI statements have been induced. Can you guess the syntax of the PHI statements?

**Answer:**

A PHI creates a new assignment by merging assignments from different paths.

Point in which the paths of two assignments to variable ‘a’ and ‘b’ merge are

# a\_1 = PHI <a\_5(3), a\_7(4)>

# b\_2 = PHI <b\_6(3), b\_8(4)>

Above paths represents if control comes from basic block 3 then assign value of ‘a\_5’ and ‘b\_6’ to ‘a\_1’ and ‘b\_2’ respectively. And if control comes from bb 4 then use the value of ‘a\_7’ and ‘b\_8’.

**Question 3:**

Can you think of an example in which a PHI node merges more than two versions of a variable?

**Answer:**

#include<stdio.h>

int main()

{

int a, b, c, d;

d=10;

if (c>d)

a=-3;

b=5;

else if (c=d)

a=5;

b=-5;

else

a=-5;

b=3;

}

c = a + b;