**White box Testing Techniques**

**Data flow testing:**

Data flow testing is a type of structural testing. It examines the data flow with respect to the variables used in the code.

1. Read a, b;

2. if(a>b);

3.x=a\*a;

4. else

5. x=b\*b;

6. print x;

Example: a=4,b=3;

Path 1=1,2,3,6

Output=12

Set a=3, b=4;

Path=1,2,4.5,6

Output=12

* **Condition Coverage:** In this technique, all individual conditions must be covered as shown in the following example:
  1. READ X, Y
  2. IF(X == 0 || Y == 0)
  3. PRINT ‘0’
  4. #TC1 – X = 0, Y = 55
  5. #TC2 – X = 5, Y = 0
* **Multiple Condition Coverage:** In this technique, all the possible combinations of the possible outcomes of conditions are tested at least once. Let’s consider the following example:
  1. READ X, Y
  2. IF(X == 0 || Y == 0)
  3. PRINT ‘0’
  4. #TC1: X = 0, Y = 0
  5. #TC2: X = 0, Y = 5
  6. #TC3: X = 55, Y = 0
  7. #TC4: X = 55, Y = 5
* **Loop Testing:** Loops are widely used and these are fundamental to many algorithms hence, their testing is very important. Errors often occur at the beginnings and ends of loops.
  1. **Simple loops:** For simple loops of size n, test cases are designed that:
     + Skip the loop entirely
     + Only one pass through the loop
     + 2 passes
     + m passes, where m < n
     + n-1 ans n+1 passes
  2. **Nested loops:** For nested loops, all the loops are set to their minimum count and we start from the innermost loop. Simple loop tests are conducted for the innermost loop and this is worked outwards till all the loops have been tested.
  3. **Concatenated loops:** Independent loops, one after another. Simple loop tests are applied for each. If they’re not independent, treat them like nesting.

**White Testing is Performed in 2 Steps:**