**ASSIGMENT 1**

**Iteration & Recursion**

Since, both the techniques used for creating algorithms and developing software.

In Iteration function, only some part of the code is repeated, while in recursive function the whole code is repeated if needed.   
Using a simple “for” loop to display numbers from one to ten is an iterative process. Examples of Simple recursive not easy to find, for creating a school timetable by rearranging the lesson or solving the n-queens problem are common example.

* Let’s take an example solved using both the techniques:

If we want to calculate the factorial of an integer n, we take the number n and multiply it by all of the integers between 1 and n. So, 2! , for example 2! = 2 x 1 = 2  
 3! = 3 x 2 = 6, etc.

Let’s solve this problem using **Iterative method**:

We have to loop all integers from 1 to n, multiplying as we go along.

**CODE: -**   
 Function factorial (n)

{   
 var loop, answer;  
 answer = 1;

for (loop=1; loop<=n; loop++)

{

answer= answer\*loop;

}

return answer;

}

Now using **Recursive method:**   
for every factorial except 0! , we can see that n! = n x (n-1)! , i.e. each factorial is the product of itself and the preceding one, so that 2! = 2 x 1!

3! = 3 x 2!,

4! = 4 x 3!, etc.

**CODE:**

Function factorial (n)

{

if (n==0)

{

Return 1;

}

else

{

Return n\*factorial (n-1);

}

}

**Verdict:** As we can see, the recursive approach is not only easier to follow, but requires fewer lines for code, and no variables, rather than the iterative method uses.