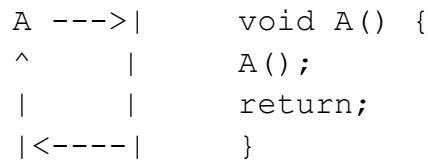
Recursive Function

A recursive function (DEF) is a function which either calls itself or is in a potential cycle of function calls. As the definition specifies, there are two types of recursive functions. Consider a function which calls itself: we call this type of recursion immediate recursion.

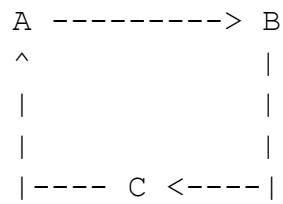
One can view this mathematically in a directed call graph.



A() is a recursive function since it directly calls itself.

The second part of the defintion refers to a cycle (or potential cycle if we use conditional statements) which involves other functions.

Consider the following directed call graph



This can be viewed in the following three functions:

```
void C() {          void B() {       void A() {
A();                C();             B();
return;             return;          return;
}                   }                }
```

Factorial progaram

```
int Factorial(int n) {
        // Simple case: 0! = 1
    if (n == 0) return 1;
        // General function: n! = n * (n - 1)!
    return (n * Factorial(n - 1));
    }
```