Recursion

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1 Overview

Recursion is a general programming technique used to solve problems with a “divide and conquer” strategy

Note:-

most computer programming langauges support recursion by allowing a function or member function to call itself within the program text.

Example of recursion

```
int factorial(int n)
{
  if (n == 1)
  {
  return 1 ;
  }
  else
  {
  return n * factorial(n-1);
  }
}
```

A recursive function call will always by conditional. There must tbe at least one base case for which the function produces a result trivially without a recursive call. For example:

```
int factorial(int n){
  if (n == 1 ){   // Base case - no recursion
    return 1;
  }
  else
  {
    return n * factorial(n-1);
  }
}
```

A function withno base cases leads to “infinite recursion” (similar to an infinite loop)

In addition to the base cases, a recursive function will have one or more recursive cases. The job of a recursive case can be seen as breaking down complex inputs into simpler ones.

In a properly designed recursive function, with each recursive call, the input problem must be simplified in such a way that eventually the base case must be reached. For example