(#) Static variable

↳ static keyword

↳ initialized only once

↳ They remain alive throughout the program.

↳ Example :- See in program section.

(#) $n! = 1 * 2 * 3 * \ldots (n-1) * n$

$5! = 1 * 2 * 3 * 4 * 5.$

```
int n, i, fact = 1;
for(i=1; i<=n; i++)
{
    fact = fact * i;
}
printf("fact = %d", fact);
```

1 2 3 4 5

i = n

1 2 6 24

fact

1 * 1 * 2 * 3 * 4

Recursion :-

$5! = 5 * 4!$ ← 24

$4 * 3!$ ← 6

$3 * 2!$ ← 2

$2 * 1!$

$1 * 0!$

1

$n! = n * (n-1)!$

Recursive function

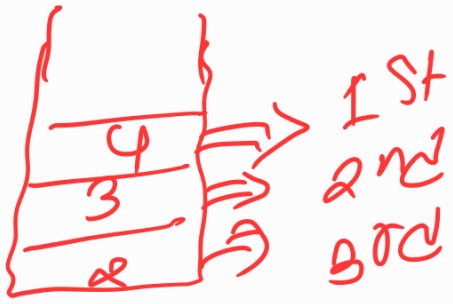
↳ Function calling itself.

```
long factorial (int n)
{
    if (n == 0)
        return 1;
    else return (n * factorial (n-1));
}
```

4 * factorial(3)

Implementation using Stack

LIFO



⇒ push, pop

2, 3, 4