

factorial of a number

Iterative approach

```
int factorial (int n)
{
    int fact = 1;
    for (int i=2; i<=n; i++)
    {
        fact = fact * i;
    }
    return fact;
}
```

Let $n = 5$

Iteration 1

$$2 \leq 5$$

$$f = 1 \times 2$$

$$= 2$$

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Iteration 2

$$3 \leq 5$$

$$f = 2 \times 3$$

$$= 6$$

Iteration 3

$$4 \leq 5$$

$$f = 6 \times 4$$

$$= 24$$

Iteration 4

$$5 \leq 5$$

$$f = 24 \times 5$$

$$= 120$$

Iteration 5

$$6 \leq 5$$

Loop ends

factorial =

$$120$$

Recursive Approach

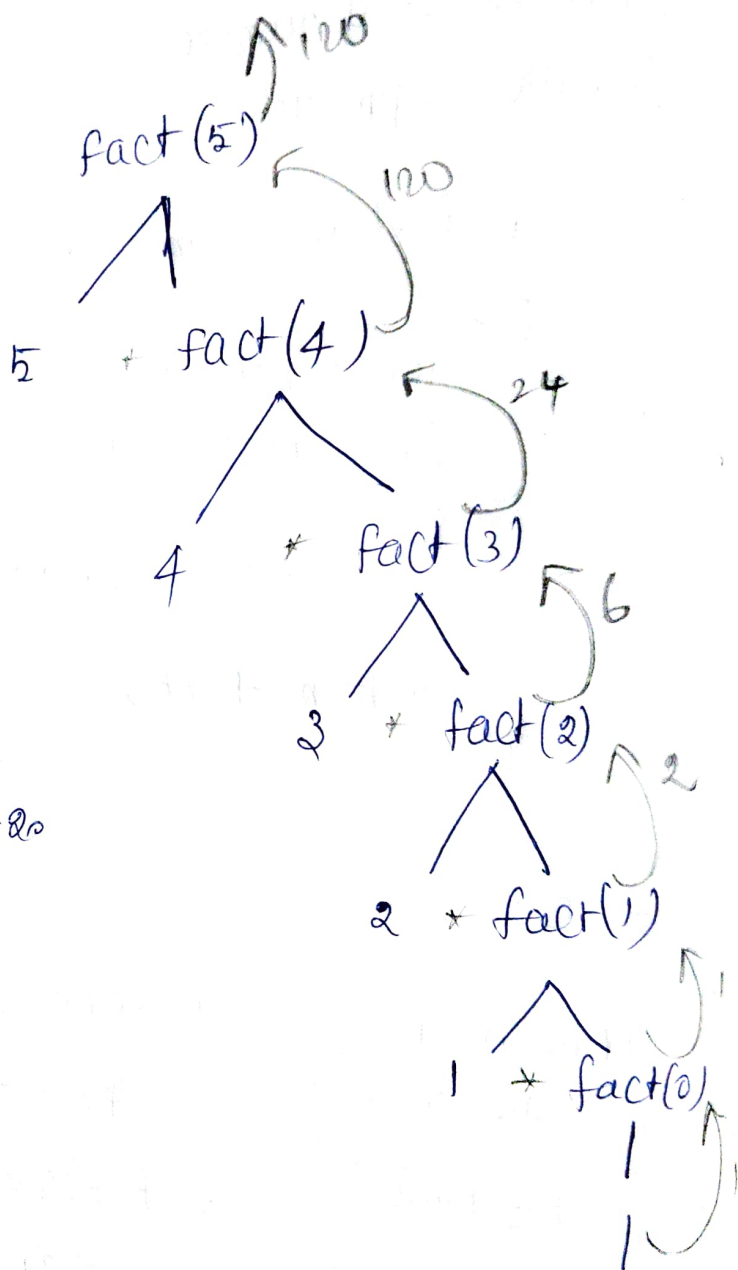
```
int fact (int n) {
```

```
    if (n == 0)
```

```
        return 1
```

```
    return n * fact(n-1)
```

3



factorial of 5 = 120