(Q) Sum of 1st n numbers

ways → parameterised
→ functional

} These are patterns. understand & learn them.

① parameterised

```
f(i, sum) {
    if (i<1) { X
        cout << sum;
        return;
    }
    f(i-1, sum+i)
}
int main() {
    int n;
    cin>>n;
    f(n,0)
}
```

i sum
f(3,0)
f(2,3)
f(1,6)
f(0,6)

f(2,3){ if( ) x f(i-1, 3+2) }

f(1,5){ if( ) x f(i-1, 5+1) }

f(0,6){ if(i<1){ cout<< sum; return; } f( ) x }

② functional

n=3
↓
3 + f(2)
↑
2 + f(1)
↓
1 + f(0) → 0

```
f(n){                                    f(2){            f(1){            f(0){
    if (n==0) return 0; X                    if() x           if() x           if (n==0)
                                                                                 return 0;
    return n + f(n-1);                   return 2 + f(1);  return 1 + f(0) 0
}            3                           }          1      }
int main(){
    n ← 3
    cout << f(n); → 6
}
```

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(8) factorial of n:

Parameterised	Functional

```
f( int n, int fact){
        if (n<1){cout<< fact;
            return n; }
        f(n-1, fact*1);
}
int main(){
        int n;
        cin>>1;
        f(n, 1 );
}
```