

# Recursion

a=2  
b=5

```
int add(int a, int b) {
    if (b == 0) return 0;
    int val = add(a, b-1);
    return a + val;
}
```

val	a	b
0	2	0
2	2	1
4	2	2
6	2	3
8	2	4
10	2	5

2 x 1 = 2 + 0

2 + 2 + 2 + 2 + 2

n	a	b
0	2	0
2	2	1
4	2	2
6	2	3

```
int add(int a, int b) {
    if (b == 0) return 0;
    int n = add(a, b-1);
    return a + n;
}
(b == 1) returns a
```

2+3

Print NumSeq(n)

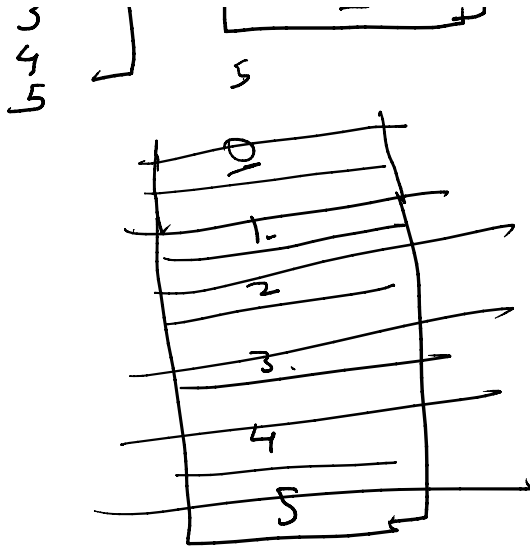
n=5

n	0	1	2	3	4	5
5						
4						
3						
2						
1						
1						
2						
3						
4						
5						

```
void PNS(n) {
    if (n == 0) return;
    Sout(n);
    PNS(n-1);
    Sout(n);
}
```

O/P

5  
4  
3  
2  
1  
1  
2  
3  
4  
5



Factorial

$$5! = 5 \times 4 \times 3 \times 2 \times 1$$

$$2 \times 5 = 32$$

$$n = 10$$

$$n = \frac{(n-1)}{2} + \text{Sout}(n)$$

$$n = 1$$

$$\text{Sout}(n)$$

$$\text{PNS}(n-1) ;$$

$$\text{Sout}(n)$$