Recursion

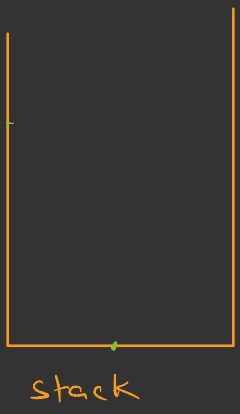
Functions

Memory management (functions)

```
p s  void print(int n) {
        Syso(n);
        print2();
}

p s void print2() {
    Syso("Hi");
}

p s void main() {
    int a = 10;
    Syso(a);
    print(a);

    print2();
    Syso("End");
}
```

Console

```
10
10
Hi
Hi
End
```



```
p s v print1(int n) {
    syso(n);
    print2(2);
}

p s v print2(int n) {
    syso(n);
    print3(3);
}

p s v print3(int n) {
    syso(n);
    print4(4);
}

p s v print4(int n) {
    syso(n);
    print5(5);
}

p s v print5(int n) {
    syso(n);
}

p s void main() {
    syso("start");
    print1(1);
    syso("End");
}
```

Console

```
Start
1
2
3
4
5
End
```

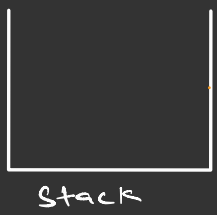
```
p s void pprint(int n) {
    if(n == 6) return;
    syso(n);
    pprint(n+1);
}

p s v main() {
    syso("main starts")
    pprint(1);
}
```

Base Case

Consol

main starts

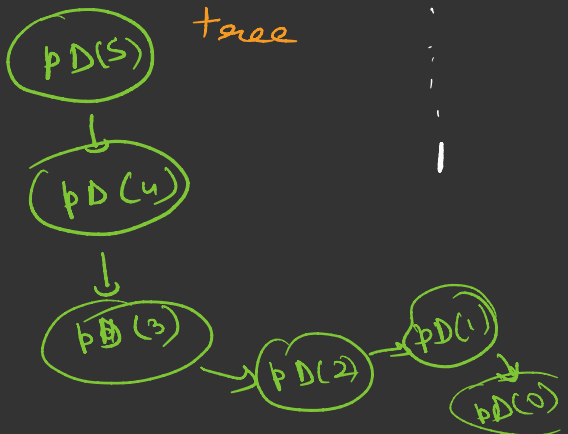
1
2
3
4
5



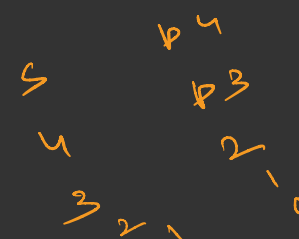
```
p s void pprintDecreasing(int n) {
    if(n == 0) return;
    syso(n);
    pprintDecreasing(n-1)
}
```

n
n-1
n-2
.
.
.
1

Recursion tree



pprintDecreasing(5)



Ques printDecreasing

Expectations	Faith	Combine
n=5 → 5, 4, 3, 2, 1	n=4 → 4, 3, 2, 1	syso(5) printDecreasing(4)

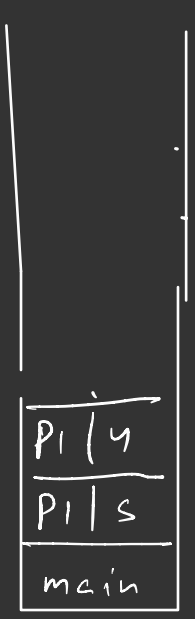
```
syso(n)
printDecreasing(n-1);
```

Ques Print Increasing 1 - n

Expectation	Faith	Combine
n=5 → 1, 2, 3, 4, 5	n=4 → 1, 2, 3, 4	printIncreasing(4); syso(5);

```
psv pI(n) {
    printIncreasing(n-1);
    syso(n)

}
```

```
if(n==0)
    return;
```



1
2
3
4

Ques Point Decreasing Increasing

Expectation

n=5

5
4
3
2
1
1
2
3
4
5

Faith

n=4

4
3
2
1
1
2
3
4

```
Syso(5);
PDI(4);
Syso(5);
```

```
if(n==0) return;
Syso(n)
PD1(n-1)
Syso(n)
```