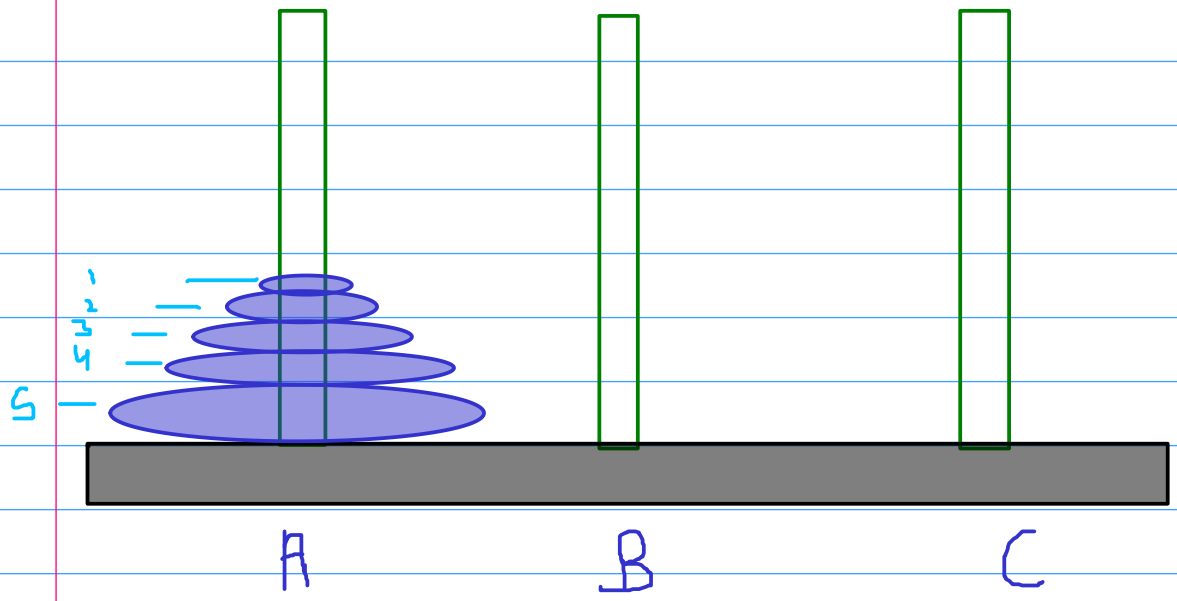
TOWER OF HANOI

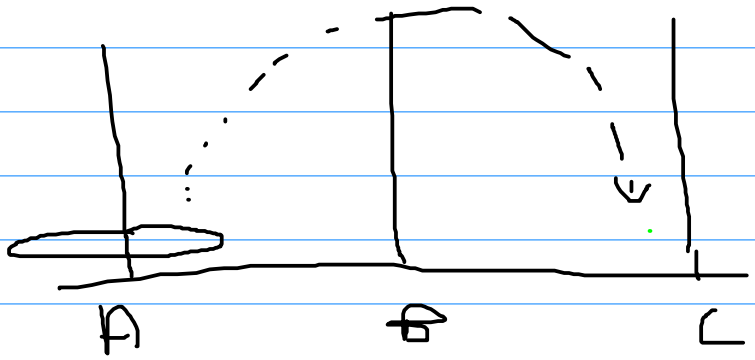


(1) ***MOVE RING TO C ONE BY ONE***

CONDITIONS

1. ***move one by one***
2. ***larger ring should not be placed on smaller one***

1 Disk →



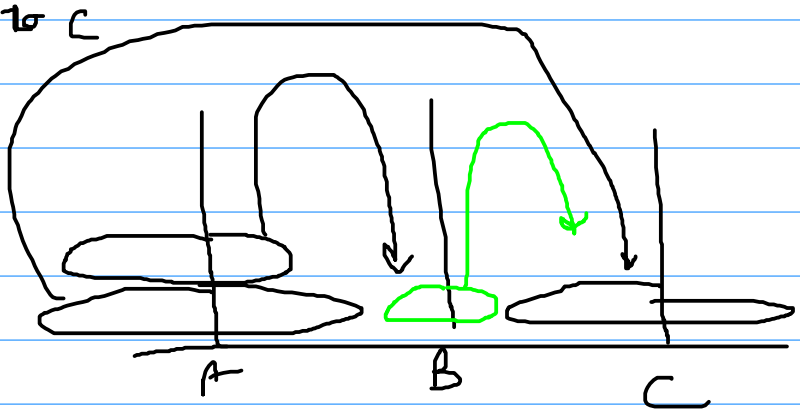

```
TOH(1, A, B, C)
{
```

from A using B to C

Move Disk from A to C

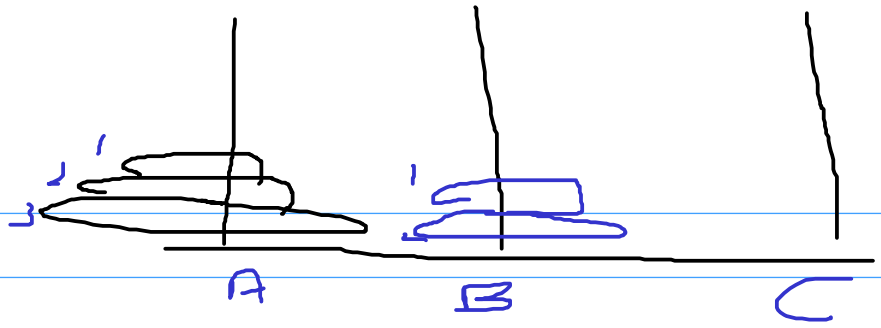
```
}
```

2 Disk




```
TOH(2, A, B, C)
{
    TOH(1, A, C, B);   // Move 1 Disk to B from A
    Move D from A to C;
    TOH(1, B, A, C);
}
```

3 Disk



TOH (3, A, B, C)

TOH(2, A, C, B)

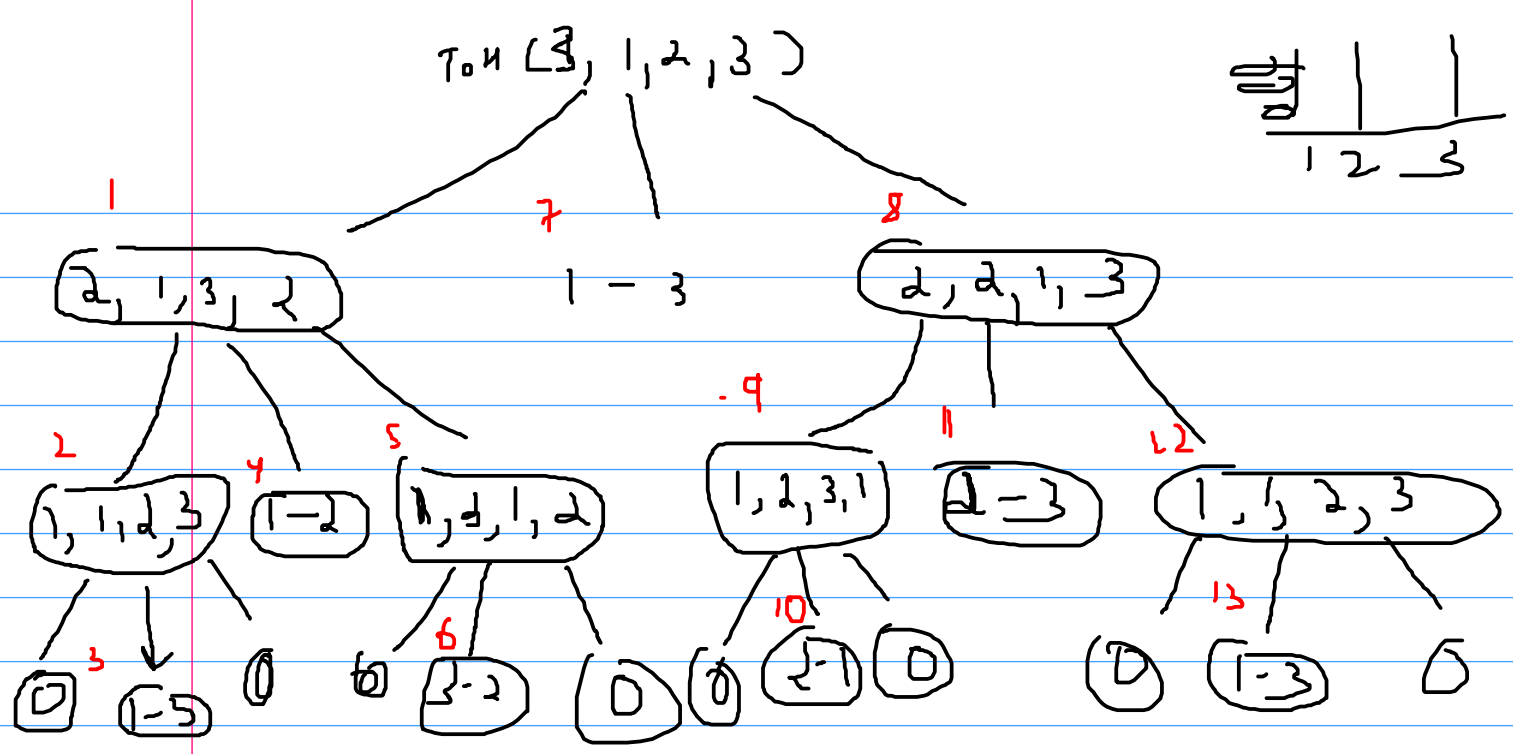
Move D to C from A;

TOH(2, B, A, C);

→ General :-

```
TOH(n, A, B, C){
    TOH(n-1, A, C, B)
        Move D to C from A
        TOH(n-1, B, A, C)
}
```

```
TOH(n, A, B, C)
{
    TOH(n-1, A, C, B);
    Cout<<"From"<<A to B;
    TOH(n-1, B, A, C);
}
```



MOVES :- (1) (1, 3)
(2) (1, 2)
(3) (3, 2)
(4) (1, 3)
(5) (2, 1)
(6) (2, 3)
(7) (1, 3)

→ To move disc to C

for $n = 3$ call → $15 = 1 + 2 + 2^2 + 2^3 = 2^4 - 1$

$n = h$ → $2^{n+1} - 1$

time → order → $O(2^n)$

→ exponential (slow algo)