

## Mathematricks

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As per our understanding so far, if there are  $N$  disks (say), first  $(N - 1)$  disks should be moved to Temporary (or Intermediate) pole and the  $N^{\text{th}}$  one is to be moved to Destination.

So it involves 3 step recursive procedure as shown below.

1. Move  $(N - 1)$  disks from Source to Temporary Pole
2. Move  $N^{\text{th}}$  (Last or Bottom) one to Destination
3. Move  $(N - 1)$  disks from Temporary to Destination

The required parameters for solving this puzzle are 'Number of disks', 'Source', 'Intermediate' and 'Destination'. Let us write a small function Called 'MoveDisk'.

```

MoveDisk(Num, Source, Temp, Dest)
{
    if (N equals 0) then Done
    else
    {
        MoveDisk(N - 1, Source, Dest, Temp) //Calling this function
                                           // within itself

        Move from Source to Destination
        MoveDisk(N - 1, Temp, Source, Dest)
    }
}

```

Let us test it for 3 disks.

So the function call becomes *MoveDisk(3, Source, Temp, Dest)*

As  $N$  is not equal to 0, it calls

```

MoveDisk(2, Source, Dest, Temp)
Source → Dest //Middle move
MoveDisk(2, Temp, Souce, Dest)

```

As  $N$  is not equal to 0 still, it calls

```

MoveDisk(1, Source, Temp, Dest)
Source → Temp

```

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*MoveDisk(1, Dest, Source, Temp)*

*Source → Dest //Middle move*

*MoveDisk(1, Temp, Dest, Source)*

*Temp → Dest*

*MoveDisk(1, Source, Temp, Dest)*

As N is not equal to 0 still, it calls

*MoveDisk(0, Source, Dest, Temp)*

*Source → Dest*

*MoveDisk(0, Temp, Source, Dest)*

*Source → Temp*

*MoveDisk(0, Dest, Temp, Source)*

*Dest → Temp*

*MoveDisk(0, Source, Dest, Temp)*

*Source → Dest //Middle move*

*MoveDisk(0, Temp, Source, Dest)*

*Temp → Source*

*MoveDisk(0, Dest, Temp, Source)*

*Temp → Dest*

*MoveDisk(0, Source, Dest, Temp)*

*Source → Dest*

*MoveDisk(0, Temp, Source, Dest)*

As N is 0, all MoveDisk functions terminate and we are left with.

*Source → Dest*

*Source → Temp*

*Dest → Temp*

*Source → Dest*

*//Middle move*

*Temp → Source*

*Temp → Dest*

*Source → Dest*

Similarly try for 2 disks, 4 disks etc. and check how it works. Don't you think it is easy? Yes! It is. We will bring some more puzzles soon.

(Let us continue in the next issue, till then good bye!)