

# $N^{\text{th}}$ ROOT USING BINARY SEARCH

★ In this problem, we need to find and return the  $N^{\text{th}}$  root of given number using Binary search.

Can obviously be solved by using math library in any programming language or just run a linear search till  $M$  to find it's  $N^{\text{th}}$  root. Time complexity is  $O(M \log_2 N)$ .

By using Binary search, we can decrease this. Just that our rules for scrapping out a part of the array will change

Pseudocode :

```
n RootBS(N, M) {
```

```
    low = 1
```

```
    high = M
```

```
    ans = -1
```

```
    while (low <= high) {
```

```
        mid = (low + high) / 2
```

```
        if (pow(mid, N) == M) {
```

```
            ans = mid
```

```
            return ans
```

```
        } else if (pow(mid, N) > M) {
```

```
            high = mid - 1
```

```
        } else low = mid + 1
```

```
}  
return ans  
}
```