

# HATFD1035

## Problem Statement :

### Print Pascal's Triangle

Write a program to generate and print the first  $n$  rows of Pascal's triangle without using built-in math or array functions. For  $n = 5$ , the output should be:

```
    1
   1 1
  1 2 1
 1 3 3 1
1 4 6 4 1
```

## Solution Code:

### Shell Script:

```
#!/bin/bash
```

```
pascal_tri() {
    local r=$1
    for (( i=0; i<r; i++ )); do
        # Print leading spaces for alignment
        for (( j=i; j<r-1; j++ )); do
```

```

        echo -n " "
    done

    local co=1

    # Print each coefficient in the current
row
    for (( k=0; k<=i; k++ )); do
        echo -n "$co "
        # Calculate the next coefficient using
the previous one
        co=$(( co * (i - k) / (k + 1) ))
    done
    echo # Move to the next line after
finishing the row
done
}

# Main execution
read -p "Enter the value of num " num_r
pascal_tri $num_r

```

Solution Screen Shots :

```
Welcome  $ pascals_triangle.sh X
C:\Users> bhush > Downloads > codes > $ pascals_triangle.sh
1  #!/bin/bash
2
3  # Function to display Pascal's Triangle
4  pascal_tri() {
5      local r=$1
6      for (( i=0; i<r; i++ )); do
7          # Print leading spaces for alignment
8          for (( j=i; j<r-1; j++ )); do
9              echo -n " "
10             done
11
12             # Initialize the first coicient
13             local co=1
14
15             # Print each coicient in the current row
16             for (( k=0; k<=i; k++ )); do
17                 echo -n "$co "
18                 # Calculate the next coicient using the previous one
19                 co=$(( co * (i - k) / (k + 1) ))
20             done
21             echo # Move to the next line after finishing the row
22         done
23     }
24
25     # Main execution
26     read -p "Enter the value of num " num_r
27     pascal_tri $num_r
```

```
MINGW64/C:/Users/bhush/Downloads/codes
bhush@MSI MINGW64 ~/OneDrive/Desktop
$ cd c:/Users/bhush/Downloads/codes

bhush@MSI MINGW64 ~/Downloads/codes
$ sh pascals_triangle.sh
Enter the value of num 5
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1

bhush@MSI MINGW64 ~/Downloads/codes
$ sh pascals_triangle.sh
Enter the value of num 3
1
1 1
1 2 1

MINGW64/C:/Users/bhush/Downloads/codes
bhush@MSI MINGW64 ~/Downloads/codes
$ sh pascals_triangle.sh
Enter the value of num 8
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1
1 7 21 35 35 21 7 1

bhush@MSI MINGW64 ~/Downloads/codes
$ sh pascals_triangle.sh
Enter the value of num 9
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1
1 7 21 35 35 21 7 1
1 8 28 56 70 56 28 8 1
```