

**INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM 695 547**

**First Year B. Tech. - Assignment Sheet
MA122-Computer Programming and Applications**

20.02.2017

Maximum Marks: 10

Assignment Sheet 7

- a. Pascal's Triangle is a triangular array of numbers that begins like this:

```
n = 0:           1
n = 1:          1   1
n = 2:         1   2   1
n = 3:        1   3   3   1
n = 4:       1   4   6   4   1
```

Each number in the Pascal's Triangle is one of the combinations

$$C(n, k) = \frac{n!}{k!(n - k)!},$$

where n is row and k is the column. For example, $C(4, 3) = 6$ is in row number 4 and column number 3. Write a program that uses `comb()` function to print Pascal's Triangle down to row number 12.

- b. The following data for students are available in the file named "studentdata.txt": (i) name of students, (ii) heights of students for five years. Write a program to :
- (a) find the average height of the students for each year and display the answer. Display should be like this: year, average height (total five lines)
 - (b) find the name of the student who is having maximum height in each year and display the answer. Display should be like this: year, name, height (total five lines).

Program notes: Read the data from the file "studentdata.txt" using *ifstream*. Use a single structure to declare three data types: 1) char name (students name), 2) int year, 3) double height(students height). These three data types can be an array.

- c. Write a program which displays the height of 5 students stored in a array:
double height [5]={155.2, 173.6, 166.0, 158.7, 169.3};
Your program should display the height in two different ways. (1) Using a pointer 'p'.
(2) Using height as address.

Program submission:

Name the programs as XXXA7Y.cpp, where XXX is the last three digits of your student id and Y is program number. For example, if the student id is 'sc17b150' and your program number is 'a' then the file name should be 150A7a.cpp. Submit the program using ftp to the server: 172.20.2.200