

5a) The file "student_height.txt" has been uploaded on Blackboard. It contains the height of 40 students measured in meters. Write a C++ program that reads from the file and calculates the sample mean \bar{x} and sample standard deviation s^2 . Use the formula:

$$\bar{x} = \frac{1}{n} \sum x_i \quad s^2 = \frac{1}{n-1} \left(\left(\sum x_i^2 \right) - n\bar{x}^2 \right)$$

Your output should be formatted as below corrected to 3 d.p. calculated from the data:

The sample mean is 1.???

The sample sd is 0.???

5b) Write a C++ program that reads an integer as the number of layers, and a character for a basic pattern, then display a upper-right triangular shape as in the examples:

Sample 1

```
Enter a number: 6
Enter a character: @

@@@@@
 @@@@@
  @@@@@
   @@@@
    @@@
     @@
      @
```

Sample 2

```
Enter a number: 4
Enter a character: A

AAAA
 AAA
  AA
   A
```