Tutorial 4 – Statistics Part 1

1. Briefly state the difference between

   (i) Categorial Data and Continuous Data
   (ii) Primary Data and Secondary Data
   (iii) Random Sampling and Stratified Random Sampling
   (iv) Observational Data and Experimental Data

2. When performing *data analysis* why sometimes is a **sample** of the data used and not the entire **population**?

3. Complete the table below and use a bar chart to display the data:

Country	Frequency	Relative Frequency
Ireland	10	
England	12	
Scotland	11	
Wales	9	
France	13	
Spain	15	

4. The system administrator in a college is interested in determining the amount of time that computing students spend logged in for each day. To do this the administrator monitors 98 randomly selected computing students for an entire day. The study provides the following information:

Logged In Time	Frequency (No. of Students)
< 2 hours	6
≥ 2 hours and < 4 hours	14
≥ 4 hours and < 6 hours	34
≥ 6 hours and < 8 hours	26
≥ 8 hours and < 10 hours	10
≥ 10 hours and < 12 hours	8

   (i) Draw a histogram of the data
   (ii) What information does the histogram present and what insights to the data understudy does it provide?

5. Explain what is meant by the terms '*mean'*, '*median'*, '*mode'* and '*standard deviation'*. Using the following data: 38, 40, 55, 60, 65
   Compute the
   i. Mean (Average)
   ii. Standard deviation
   iii. Median

6. Using the following data: 10, 12, 7, 6, 3, 15, 21, 4, 9, 5, 13, 19
   Compute the
   i. Mean (Average)
   ii. Standard deviation
   iii. Median
   iv. Quartiles

7. a) Compute the *mean*, *median* and *standard deviation* for the following list of ages: 17, 21, 17, 18, 17, 19, 18, 17, 63

   b) Arrange the values in ascending order and remove the largest value in the list. Recalculate the *mean* and *median* for the modified list of values. Discuss the effect of adding or removing an extreme value on the *mean* and *median* values.

Formula Sheet

Mean: $\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$

Standard Deviation (1): $s^2 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}$

Standard Deviation (2): $s^2 = \frac{\sum_{i=1}^{n} x_i^{\,2} - n(\bar{x})^2}{n-1}$