1. A manager wants to estimate the proportion of faulty resistors produced (in a particular week). Individual units are selected at random times during the morning shift of each day and then tested for faults. In total 1520 resistors were tested and 18 if these were found to be faulty.

   (i) What is the population?
   (ii) What is the sample?
   (iii) What is the parameter? What symbol do we use? What is its value?
   (iv) What is the statistic? What symbol do we use? What is its value?
   (v) Identify any potential bias.

2. ITD wish to determine the duration of time that a UL student spends on Facebook each day. They send an email of enquiry to 500 students (by randomly selecting ID numbers) - 286 students respond. The mean time spent on Facebook in this sample was found to be 1.5 hours per day.

   (i) What is the population?
   (ii) What is the sample?
   (iii) What is the parameter? What symbol do we use? What is its value?
   (iv) What is the statistic? What symbol do we use? What is its value?
   (v) Identify any potential bias.

3. A researcher wants to know if the Irish public are in support of a new government policy - she believes that less than 30% of the public support it. She wishes to test this hypothesis by carrying out a survey. From a list of all individuals living in her local area, shes draws a random sample of 80 individuals and finds that 23 are in favour.

   (a) What is the population?   (b) What is the sample?   (c) What is the value of n?
   (d) Identify the the parameter and statistic - give the symbol and value for both.   (e) What type of data was collected on each of the individuals in the sample?   (f) Identify any potential bias.   (g) Can we confirm her hypothesis?

4. A researcher wants to know if the Irish public are in support of a new government policy - she believes that less than 30% of the public support it. She wishes to test this hypothesis by carrying out a survey. From a list of all individuals living in her local area, shes draws a random sample of 80 individuals and finds that 23 are in favour.

   (a) What is the population?   (b) What is the sample?   (c) What is the value of n?
   (d) Identify the the parameter and statistic - give the symbol and value for both.   (e) What type of data was collected on each of the individuals in the sample?   (f) Identify any potential bias.   (g) Can we confirm her hypothesis?

5. Employees of a software firm were each assigned the task of developing a tool. Once completed, they each submitted their code and executable file. A number of details were recorded:

   (a) The number of lines of code.   (b) Time taken to develop the tool.   (c) Experience level of the employee (high, average, low).   (d) The size of the executable file (megabytes).
   (e) Does the tool work? (yes/no)   (f) The employee's age.   (g) Gender.

   For each of the above, identify the data type.

6. A researcher wants to know if the Irish public are in support of a new government policy. The researcher believes that less than 40% of the public support it, and wishes to test this hypothesis by carrying out a survey. From a list of all individuals living in the local area, shes draws a random sample of 200 individuals and finds that 70 are in favour.

   (a) What is the population?   **(b)** What is the sample?   **(c)** What is the value of n?
   (d) Identify the the parameter and statistic - give the symbol and value for both.   **(e)** What type of data was collected on each of the individuals in the sample?   **(f)** Identify any potential bias.

7. Employees of a software firm were each assigned the task of developing a tool. Once completed, they each submitted their code and executable file. A number of details were recorded:

   (a) The number of lines of code.   **(b)** Time taken to develop the tool.   **(c)** Experience level of the employee (high, average, low).   **(d)** The size of the executable file (megabytes).
   (e) Does the tool work? (yes/no)   **(f)** The employee's age.   **(g)** Gender.

   For each of the above, identify the data type.

8. Determine if the following are discrete or continuous variables:

   (i) The number of defective items in a consignment of 100 items.

   (ii) The heights of your classmates.

   (iii) The distance traveled by a randomly chosen business consultant last year.

   (iv) The number of books on your shelves.

   (v) The weights of aubergines.

   (vi) The age of a person.

   (vii) The number of words in a book.