# Practical 1

**Exercise P1**

1. Open your textbook on p.17 at the **Norris** file.
2. On the computer, open the **Norris** file on ClickUP in the ***Data files for Practicals*** folder
3. Calculate the average lifetime of the 200 light bulbs by entering the following formula in cell C2: **=AVERAGE(A2:A201).** Check your answer on p.20.

**Exercise P2**

1. Enter the lifetimes of the first 5 light bulbs into a new worksheet as shown in Figure 1.1.

| | A | B | C |
|---|---|---|---|
| 1 | | **Hours until Burnout** | |
| 2 | | 107 | |
| 3 | | 54 | |
| 4 | | 66 | |
| 5 | | 62 | |
| 6 | | 74 | |
| 7 | **Sum** | | |
| 8 | **N** | | |
| 9 | **Average** | | |

Figure 1.1

2. The average is computed by dividing the sum of the 5 light bulbs by the number of observations, this can done in Excel using the following steps:
   - Enter the formula: **=SUM(B2:B6)** in cell B7 as follows:

| |
|---|
| Type **=SUM(** in cell B7.<br>Click in cell B2 and drag down to cell B6.<br>In the Formula Bar, you should see **=SUM(B2:B6)**<br>Press **Enter** |

   - Use **N** as an abbreviation for the number of observations. There are 5 lifetimes, so type 5 into cell B8.
   - To compute the average we divide **Sum** by **N,** therefore enter the formula **=B7/B8** as follows:

| |
|---|
| Type = in cell B9 and then click in cell B7.<br>Type / and then click in cell B8.<br>In the Formula Bar, you should see **=B7/B8**<br>Press **Enter** |

   - Verify your answers with Figure 1.2.

| | A | B | C |
|---|---|---|---|
| 1 | | **Hours until Burnout** | |
| 2 | | 107 | |
| 3 | | 54 | |
| 4 | | 66 | |
| 5 | | 62 | |
| 6 | | 74 | |
| 7 | **Sum** | 363 | |
| 8 | **N** | 5 | |
| 9 | **Average** | 72.6 | 72.6 |

Figure 1.2

3. We are now going to calculate the same average in cell C9 by making use of Excel's AVERAGE function.

   Calculate the **Average** by entering the formula : **=AVERAGE(B2:B6)** in cell C9 as follows:

   > Type **=AVERAGE(** in cell C9.
   > Click in cell B2 and drag down to cell B6.
   > In the Formula Bar, you should see **= AVERAGE (B2:B6)**
   > Press **Enter**

   Verify your answer with Figure 1.2.

4. Calculate the **Sum** and the **Average** of the lifetimes of the 5 light bulbs in Figure 1.1 using your calculator. Make sure that you also know how to use your calculator in STAT-mode. Verify answers with Figure 1.2.

**Exercise P3**

1. Consider the following table on fuel economy information for 10 automobiles:

| Car | Size | Cylinders | City MPG | Highway MPG | Fuel |
|---|---|---|---|---|---|
| Audi A8 | Large | 12 | 13 | 19 | Premium |
| BMW 328Xi | Compact | 6 | 17 | 25 | Premium |
| Cadillac CTS | Midsize | 6 | 16 | 25 | Regular |
| Chrysler 300 | Large | 8 | 13 | 18 | Premium |
| Ford Focus | Compact | 4 | 24 | 33 | Regular |
| Hyundai Elantra | Midsize | 4 | 25 | 33 | Regular |
| Jeep Cherokee | Midsize | 6 | 17 | 26 | Diesel |
| Pontiac G6 | Compact | 6 | 15 | 22 | Regular |
| Toyota Camry | Midsize | 4 | 21 | 31 | Regular |
| Volkswagen Jetta | Compact | 5 | 21 | 29 | Regular |

2. Copy the table into an Excel Spreadsheet.
3. Calculate the total number of **Cylinders** in the ten cars using your calculator. Check your answer with Excel using the SUM function, see Figure 1.3.

   **Answer: 61**

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | **Car** | **Size** | **Cylinders** | **City MPG** | **Highway MPG** |
| 2 | Audi A8 | Large | 12 | 13 | 19 |
| 3 | BMW 328Xi | Compact | 6 | 17 | 25 |
| 4 | Cadillac CTS | Midsize | 6 | 16 | 25 |
| 5 | Chrystler 300 | Large | 8 | 13 | 18 |
| 6 | Ford Focus | Compact | 4 | 24 | 33 |
| 7 | Hyundai Elantra | Midsize | 4 | 25 | 33 |
| 8 | Jeep Grand Cherokee | Midsize | 6 | 17 | 26 |
| 9 | Pontiac G6 | Compact | 6 | 15 | 22 |
| 10 | Toyota Camry | Midsize | 4 | 21 | 31 |
| 11 | Volkswagen Jetta | Compact | 5 | 21 | 29 |
| 12 | **Total** | | **=SUM(C2:C11)** | | |

Figure 1.3

4. Calculate the total **City MPG** using the AutoSum button, Σ, on the Standard Toolbar by making use of the following steps:

| |
|---|
| Click in cell D12.<br>Then click the AutoSum button Σ.<br>In the Formula Bar, you should see **=SUM(D2:D11)**<br>Press **Enter** |

**Answer:** **182**

5. Answer the following questions by making use of Excel.
   a) What is the average miles per gallon for city driving?
   b) On average, how much higher is the miles per gallon for highway driving compared to city driving?
   c) What percentage of the cars have four-cylinder engines?
   d) What percentage of the cars use regular fuel?

The **formula worksheet** and the **value worksheet** are given in Figure 1.4 and Figure 1.5 respectively.

| | | |
|---|---|---|
| 15 | a | =AVERAGE(C2:C11) |
| 16 | b | =(AVERAGE(E2:E11)-AVERAGE(D2:D11)) |
| 17 | c | =3/10*100 |
| 18 | d | =6/10*100 |

Figure 1.4 Formula worksheet

| | | |
|---|---|---|
| 15 | a | 6.1 |
| 16 | b | 7.9 |
| 17 | c | 30 |
| 18 | d | 60 |

Figure 1.5 Value worksheet