# Python programming exercises

1. Read the time in HH:MM:SS format (e.g. 12:34:56) from keyboard and extract the hours, minutes and seconds using the split method. Convert the values to `int`

2. Write a loop, which prints the area and volume of spheres with radii from 2 to 20 in steps of 2 (with a bit of explanation, of course).

$$\begin{aligned} A &= 4\pi r^2 \\ V &= \frac{4}{3}\pi r^3 \end{aligned}$$

3. Write a loop, which reads three numbers from the keyboard and prints the sum and the average at the end.

4. Write a function which calculates the volume of a sphere as $V = \frac{4}{3}R^3$ with radius $R$. Write another function which calculates the volume of the sphere as $V = \frac{4}{3}\left(\frac{D}{2}\right)^3$ with diameter $D$. Values should be returned to the main program.

   Read in a value then read in a string containing either `r` or `d` and use an `if ...else ...` block to call the appropriate functions and print out the result.

5. Embed the main program from 4 into a while loop, which stops execution if a string other than `r` or `d` is entered.

6. Write and call a function, which computes the value of the factorial of $n$.

$$n! = 1 \times 2 \times 3 \times \ldots \times n$$

7. Assign the string `University of Hertfordshire` to a variable. Use indexing to extract

   (a) the `y`

   (b) the `H`

   (c) the last `e` using the minus notation.

   (d) Use slicing to extract `Hertfordshire`.

8. Create a list with five different textstrings (e.g. a shopping list).

   (a) Extract and print the fourth item using indexing.

   (b) Extract and print the second and third item using slicing.

   (c) Replace the last item in the list with a new entry.

   (d) Continuing with this list append an entry to this list. Then sort the list. Print the result.