## Introduction to $\mathbf{R}$ <br> Session 9: Writing functions

1. The factorial of a non-negative integer $n$ is defined to be

$$
n!=n *(n-1) *(n-2) \ldots * 2 * 1,
$$

so for example, $4!=4 * 3 * 2 * 1=24$. Create a function that takes a nonnegative integer as the argument and returns the factorial of the integer. (Hint: you can use a while loop, but there are many ways to do this). What is the value of 10 !?
2. The formula for converting a temperature in Fahrenheit (F) to Celsius (C) is:

$$
C=(5 / 9) *(F-32)
$$

Write a function that converts a Fahrenheit temperature to Celsius. Use this function to create a data frame containing Fahrenheit values 30, 31, 32, up to 100, and the corresponding temperatures in Celsius.
3. Obtain a root for the following function with the Newton-Raphson method:

$$
f(x)=5 x^{3}-4 x^{2}+12 x-7
$$

(Hint: Implement the Newton-Raphson function given in the session 9 slides).

