**Session 1 - Assignment 1**

1. **Say True or False for the below statements:**

**• Prescriptive Analytics used to predict the future outcomes?**

**Answer :** FALSE.

**Prescriptive** Analytics use optimization and simulation algorithms to advice on possible outcomes and answer: “What should we do?”

Whereas **Predictive** Analytics use statistical models and forecasts techniques to understand the future and answer: “What could happen?”

**• Base R packages installed automatically?**

**Answer:** TRUE.

Base packages can be seen with “installed.packages()”.

1. **What is Recycling of elements in a vector?**

**Answer:** Recycling occurs when vector arithmetic is performed on multiple vectors of different sizes. R takes the shorter vector and repeats them until it becomes long enough to match the longer one.

1. **Give an example of recycling of elements.**

**Answer:** If two vectors are of unequal length, the shorter one will be recycled in order to match the longer vector. For example, the following vectors u and v have different lengths, and their sum is computed by recycling values of the shorter vector u.

> u = c(10, 20, 30)   
> v = c(1, 2, 3, 4, 5, 6, 7, 8, 9)   
> u + v   
[1] 11 22 33 14 25 36 17 28 39

x <- c(10.4, 5.6, 3.1, 6.4, 21.7)

y <- c(x, 0, x)

v <- 2\*x + y + 1

A constant is simply repeated. So with the above assignments the command

> v <- 2\*x + y + 1 generates a new vector v of length 11 constructed by adding together, element by element, 2\*x repeated 2.2 times, y repeated just once, and 1 repeated 11 times.