# ROBOTICS – Python Development – Lab 6 - Homework

1. We need to generate surrogate energy consumption data for three version of an electric engine: Mark1, Mark2 and Mark3. The data has to be generated for the entire 2023 year, except when the day is a Saturday or a Sunday.
   The rules for data generation are:

   a) Mark1 has a 30% chance to consume 100KW/day, a 40% chance to consume 110 KW/day and a 30% chance to consume 120 KW/day;
   b) Mark2 has a 10% chance to consume 90KW/day and a 90% chance to consume 115 KW/day;
   c) Mark3 has a 20% chance to consume 90KW/day, a 70% chance to consume 110 KW/day and a 10% chance to consume 125KW/day;

   Please generate random surrogate data for year 2023, saving it in a CSV file called **energy_consumption.csv,** having the following colums (write column headers as well):

   a) date – the date for the measurement in the form YYYY-MM-DD (e.g. 2023-12-01);
   b) day – the day number;
   c) day_in_week – the number of the day in the week;
   d) day_name – the day name, you can use datetime.strftime('%A');;
   e) month – the month number;
   f) month_name - the month name, you can use datetime.strftime('%B');
   g) mark_1 – the energy consumption for Mark1 engine;
   h) mark_2 – the energy consumption for Mark2 engine;
   i) mark_3 – the energy consumption for Mark3 engine;

2. Read the data from the file **energy_consumption.csv** and export it to an Excel file containing the following sheets:

   a) **Mark 1 Data** – containing all the date information data along with Mark1 engine energy consumption. Use the column names to be the same as from csv, however for mark_1 consumption use the name enegy_consumption.
   b) Perform the same for the other engine versions using **Mark 2 Data** and **Mark 3 Data** sheets;
   c) For each sheet add at the end the following cells at column 1, having 2 rows space from the last data row, using formulas:
      a. **Min: <minimum value>** – the minimum value for energy_consumption;

b. **Average: \<average value\>** – the average value for energy_consumption;
c. **Max: \<average value\>** – the maximum value for energy_consumption.