LABORATORY : Correlation

1. Brain Size and Intelligence

   Data in *brainSize.xlsx* was collected from 40 introductory psychology students at a university. Subjects took four subtests (Vocabulary, Similarities, Block Design, and Picture Completion) of the Wechsler Adult Intelligence Scale. The researchers used Magnetic Resonance Imaging (MRI) to determine the brain size of the subjects. Information about gender and body size (height and weight) are also included. The researchers withheld the weights of two subjects and the height of one subject for reasons of confidentiality.

   The MRI scans consisted of 18 horizontal MR images. The total count served as an index for brain size. The larger the total count, the larger the size of the brain.

   Attributes :
   - Gender: Male or Female
   - FSIQ: Full Scale IQ scores based on the four Wechsler subtests
   - VIQ: Verbal IQ scores based on the four Wechsler subtests
   - PIQ: Performance IQ scores based on the four Wechsler subtests
   - Weight: body weight in pounds
   - Height: height in inches
   - MRI_Count: total pixel Count from the 18 MRI scans

   1. Clean the data, if necessary. Describe data using descriptive statistics.
   2. Create scatter plots that show relationships between brain size and other attributes.
   3. Find correlation coefficient by calculation between brain size and FSIQ by your own formula and Excel function. Compare the results.
   4. Construct a correlation matrix.
   5. Interpret correlation (write down in the excel file itself)
      Is intelligence associated with larger brain size?
      How strong is the relationship?
      Does the relationship depend on gender, weight, height ?
      etc.

   What to submit : the excel file

2. Happiness

1. Get happiness data of year 2019 (2019.csv) from *https://www.kaggle.com/datasets/sougatapramanick/happiness-index-2018-2019*
2. Read information about the dataset. Make sure that you understand the data.
3. Clean the data, if necessary. Describe data using descriptive statistics.
4. Analyze relationships between happiness score (column C) and other attributes. Write a brief report (in the excel file itself)
5. *sugar-consumption-by-country.csv* contains annual per-capita sugar consumption of 185 countries. Sugar consumption is in columns R and S. Let's assume that the data is from the year 2019.
6. Analyze relationship between sugar consumption and happiness score. Write a brief report (in the excel file itself)

What to submit : the excel file