Problem description

1. The program shall be able to collect data through a dialogue with a human person and to write these data to a text file. Moreover, the program shall be able to read these data from the text file and to visualize them using a diagram.
2. To achieve the requirements of point 1, the program shall ask a human person a series of quality-of-day questions and use the answers to calculate a quality-of-day score.
3. In addition to calculating the quality-of-day score of point 2, the program also shall ask the person that uses it about the level of felt happiness.
4. The program shall write the data of points 2 and 3 to a file and use a diagram to visualize them. The diagram shall also be saved.
5. The program shall explain to a human user what it does and print all results in the output terminal.
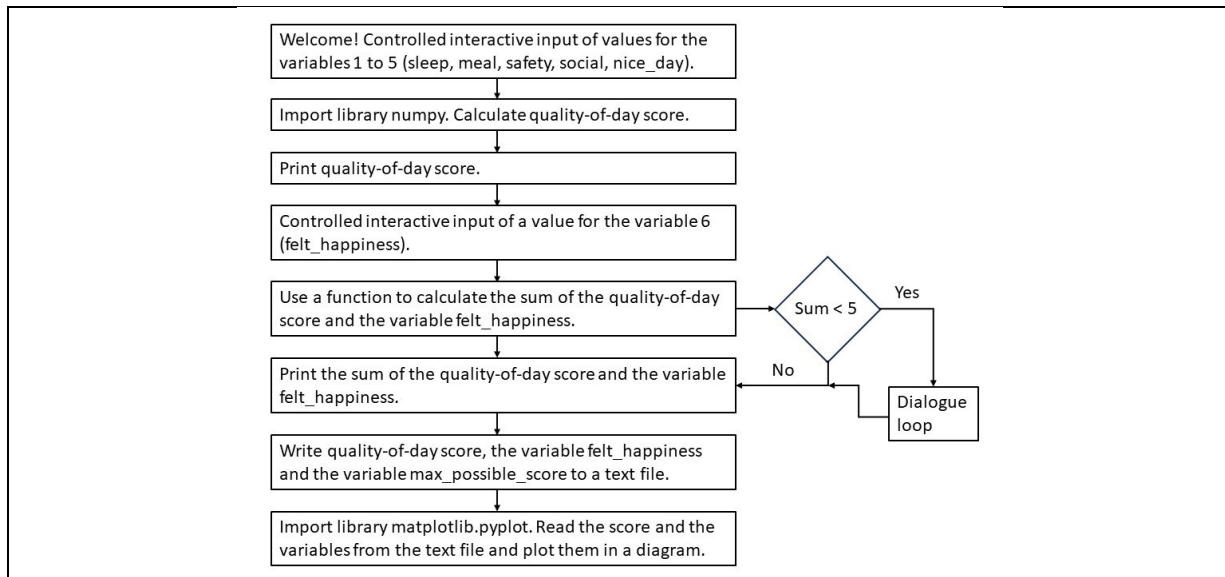
Design

Figure 1. The program has a linear structure that includes steps to:
1. collect data through a dialogue with a user
2. calculate simple scores
3. write these scores to a text file
4. plot these scores in a bar diagram and to save it.

The welcome part of this program explains to a user what this program does and offers an opportunity to quit. If the user continues, the program asks five questions to set data to the variables sleep, meal, safety, social and nice_day that are stored in an array. The array is then used to calculate the sum of the values of these variables, which is the quality-of-day score. The structure of the question part is outlined in figure 2.
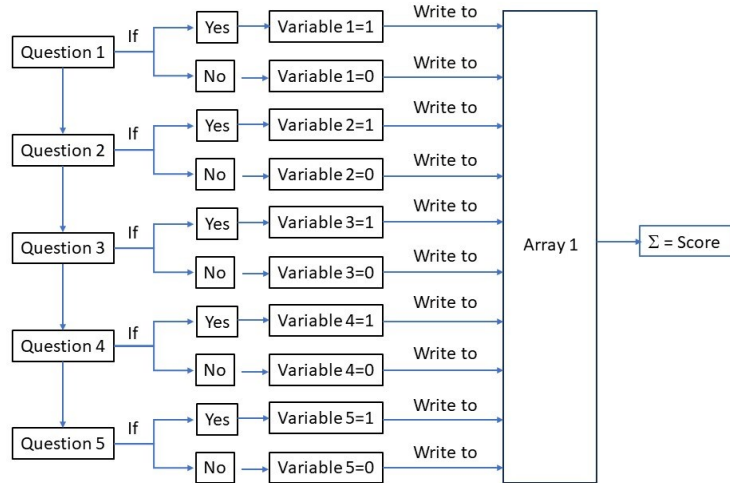
Figure 2. The question part that follows the welcome part consists of five interactive questions that allow the user to answer them with Yes or No. If the answer is Yes, the variable gets the value 1 and if it is No the variable gets the value 0. The sum of the five variables can have any value in the range of 0 to 5. The five variables are part of an array that calculates their sum, which in this program is the quality-of-day score.

The program proceeds and asks the user to set a value in the range of 1 to 5 to a variable that describes their felt level of happiness (felt_happines). The variable felt_happiness and the quality-of-day score are part of a function that calculates their sum. The sum can have a value in the range of 1 to 10.

If the sum is lower than 5, the user is directed to a dialogue loop that offers choices to return to the principal flow of the program or to quit. The dialogue loop has a similar structure as the question part in figure 2, but it contains no array. If the sum is 5 or higher, the program writes the scores to a text file and plots them in a diagram.

Implementation

The code is present in the document Quality_of_my_day_v2.py.

Verification

The verification part consists of white box verification of the code to make sure that the dialogue features of this program work consistently. There is no need of independent control calculations of the results of mathematical function because this program uses no advanced mathematics. The only numbers that are used in this program are the natural numbers from 1 to 10 and 0.

There are weak points in the dialogue features because the user input is not strictly controlled and the program has no ability to cope with input values that might appear to be correct but are not defined in the code. For instance, if a user enters "Yes" instead of "yes", the variables to which this questions points will not be defined and the program will not work properly.