ATILIM UNIVERSITY
DEPARTMENT OF COMPUTER ENGINEERING

COMPE 325 – STUDY OF PROGRAMMING LANGUAGES
HOMEWORK III

Fall 2022-23
Instructor: Çiğdem Turhan
Assistant: Zeynep Yaren Oğuz
Due Date: 23.12.2022

Write a program that calculates the amount of additional insulin that five Type-1 diabetics should take for the blood glucose level to be above 120 mg/dl. In your program,

- o   Take the user's name and 12-hour blood glucose values as input. Keep the name and list in a dictionary.

- o   Determine the blood glucose values above 120 mg/dl for each patient using the filter() function and display on the screen.

- o   Input the number of times insulin is taken in 12 hours and these insulin doses. Calculate the total amount of insulin with the reduce() function.

- o   Calculate how much mg/dl blood sugar should decrease for values above 120 mg/dl and keep these values in a list. (*x-120*, *x is each element of the list of values greater than 120*). Write a calculate() function that takes the total amount of insulin and this list as parameters. Use the formula *1800/total amount of insulin* to calculate how many mg/dl a unit of insulin lowers blood sugar. After calculating a unit, calculate how much insulin is needed for each data you keep in the list (x-120). (Assume that *blood glucose values above 120 mg/dl : 250,145,189 ,then the list should be [130,25,69], you should calculate how much insulin is needed for 130 mg/dl, 25 mg/dl, 69 mg/dl*)

- o   Print on the screen how many units of insulin are needed for each patient to reduce blood glucose values above 120 mg/dl to normal levels.

Sample Run:

```
Enter patient name: yaren
Enter patient's 12-hour blood glucose values: 147 250 205 187 145
100 87 65 75 98 110 125
Glucose values over 120 mg/dl :  [147, 250, 205, 187, 145, 125]
How many times did you take insulin in 12 hours? : 4
Enter insulin doses: 8 2 1 1

Enter patient name: naz
Enter patient's 12-hour blood glucose values: 258 214 189 154 106
97 120 126 132 109 132 120
Glucose values over 120 mg/dl :  [258, 214, 189, 154, 126, 132,
132]
How many times did you take insulin in 12 hours? : 5
Enter insulin doses: 9 4 2 2 2

Enter patient name: melih
Enter patient's 12-hour blood glucose values: 158 148 135 112 105
135 147 136 127 120 99 130
Glucose values over 120 mg/dl :  [158, 148, 135, 135, 147, 136,
127, 130]
How many times did you take insulin in 12 hours? : 4
Enter insulin doses: 7 4 2 1

                              .
                              .
                              .

12-hour blood glucose values of patients in service:

{'yaren': [147, 250, 205, 187, 145, 100, 87, 65, 75, 98, 110,
125], 'naz': [258, 214, 189, 154, 106, 97, 120, 126, 132, 109,
132, 120], 'melih': [158, 148, 135, 112, 105, 135, 147, 136, 127,
120, 99, 130], 'hilal': [121, 115, 174, 189, 214, 195, 183, 157,
134, 119, 117, 110], 'ali': [278, 295, 200, 196, 178, 166, 154,
115, 100, 98, 112, 120]}

yaren should take
0.18 unit insulin for 147 mg/dl
0.87 unit insulin for 250 mg/dl
0.57 unit insulin for 205 mg/dl
0.45 unit insulin for 187 mg/dl
0.17 unit insulin for 145 mg/dl
0.03 unit insulin for 125 mg/dl
      ...
ali should take
2.11 unit insulin for 278 mg/dl
2.33 unit insulin for 295 mg/dl
1.07 unit insulin for 200 mg/dl
1.01 unit insulin for 196 mg/dl
0.77 unit insulin for 178 mg/dl
0.61 unit insulin for 166 mg/dl
0.45 unit insulin for 154 mg/dl
```