Introduction to Programming
Exercise 3

Question 1

In this exercise you are required to create a script that calculates the price of concert tickets depending on the size of the group attending and the ages of the ticket holders.

Create a script called **conTickets**, and in it, do the following:

- Create a variable called **groupSize** (a scalar), a random integer (round number) between 1-8, representing the size of the group buying the tickets.
- Create a variable called **ages,** a vector (1 x groupSize) containing random integers between 8-90. This variable represents the age of the ticket holders.
- Create a variable called **tickPrice** (a scalar) which represents the total group price for the concert tickets, calculated according to the following:
  - A full price ticket for an adult is 180 NIS.
  - The ticket price for children (under the age of 18) is 100 NIS.
  - Soldiers (ages 18-21) get a 50% discount off the adult ticket price.
  - Students (ages 22-25) or senior citizens (over the age of 65) get a 60 NIS discount.
  - If the group contains 6 or more participants, the total price is 580 NIS.

Example:

For the following variables: **groupSize** = 4

ages = [14 28 18 23]

The results variable should be: **tickPrice** = 490

Question 2

Write a script called **myStats** that calculates some statistical measures over a data matrix.

In your script, do the following:

a. Create a data matrix called **myData** of size 180x150 containing random numbers between -1000 and 1000.

b. Create and calculate the following variables (do **not** make any changes to *myData*):

i. **matMin** – the minimal value in **myData** (scalar).
ii. **matMax** – the maximal value in **myData** (scalar).
iii. **matSum** – summation of all values in **myData** (scalar).
iv. **matMean** – mean of all values in **myData** (scalar).
- **Note: Do not use any Matlab built-in statistics command (such as sum, mean, std, min, max, range, etc.).** The goal of the exercise is to write your own algorithm to find the minimal, maximal and mean values (using loops and conditions).

Question 3

Farmer Moshe grows chicken for eggs. Before selling the eggs they need to be sorted by their weights to 4 groups: small (s), medium (m), large (l) and extra-large (xl). Write a code to help the farmer sort the eggs and calculate his earnings:
Write a script called **sortEggs**, and in it do the following:
a. Create a vector called **weightEggs** of size 1x60 containing random numbers between 45 and 85.

b. Create 4 new variables called **sEggs, mEggs**, **lEggs** & **xlEggs**, which will have the total number of eggs in each size group. Your script should sort the weights of the eggs in the vector weightEggs into groups according to the following:

* Eggs weighing up to (or equal to) 54 gr should be classified as small.
* Eggs weighing over 54 and up to (or equal to) 64 gr should be classified as medium.
* Eggs weighing over 64 and up to (or equal to) 74 gr should be classified as large.
* Eggs weighing over 74 gr should be classified as extra-large.

Example:

If **weightEggs** is: [46.3, 73, 75.5, 50, 70, 54.9, 62, 66], than the result variables should be:

sEggs = 2 **mEggs** = 2

lEggs = 3 **xlEggs** = 1

c. When selling the eggs the farmer is paid according to the following scale:

0.88 NIS per extra-large egg, 0.72 NIS per large egg, 0.54 NIS per medium egg, 0.47 NIS per small egg.

Based on the results of the previous section, calculate the total amount (in NIS) of money the farmer will be paid for all his eggs and assign this number to a new variable called **totalMoney**.

Notes:

- Make sure all your variables have exactly the correct names as defined in the exercise, including upper/lower cases distinctions.
- The scripts (.m files) you write should be sent by e-mail to:ex.matlab@gmail.com
  Files should be sent no later than **Monday (13.11.17) / Wednesday (15.11.17)** (according to your tirgul group) - **at midnight**.
- Hard copy of your exercise should include printed copies of your scripts. Please staple all the sheets together and clearly write your name and ID number on all of them.
  The hard copies should be submitted at the beginning of your tirgul group.

Good Luck!