

Question #1

(Sorted?) Write the following function that returns true if the list is already sorted in increasing order:

```
def isSorted(lst):
```

Write a test program that prompts the user to enter a list and displays whether the list is sorted or not. Here is a sample run:

```
Enter list: 1 1 3 4 4 5 7 9 10 30 11 --> Enter
The list is not sorted
```

```
Enter list: 1 1 3 4 4 5 7 9 10 30 --> Enter
The list is already sorted
```

Question #2

(Algebra: multiply two matrices) Write a function to multiply two matrices. The header of the function is:

```
def multiplyMatrix(a, b)
```

To multiply matrix **a** by matrix **b**, the number of columns in **a** must be the same as the number of rows in **b**, and the two matrices must have elements of the same or compatible types. Let **c** be the result of the multiplication. Assume the column size of matrix **a** is **n**. Each element c_{ij} is $a_{i1} \times b_{1j} + a_{i2} \times b_{2j} + \dots + a_{in} \times b_{nj}$. For example, for two 3×3 matrices **a** and **b**, **c** is

$$\begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix} \times \begin{pmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{pmatrix} = \begin{pmatrix} c_{11} & c_{12} & c_{13} \\ c_{21} & c_{22} & c_{23} \\ c_{31} & c_{32} & c_{33} \end{pmatrix}$$

where $c_{ij} = a_{i1} \times b_{1j} + a_{i2} \times b_{2j} + a_{i3} \times b_{3j}$.

Write a test program that prompts the user to enter two 3×3 matrices and displays their product. Here is a sample run:

```
Enter matrix1: 1 2 3 4 5 6 7 8 9 --> Enter
Enter matrix2: 0 2 4 1 4.5 2.2 1.1 4.3 5.2 --> Enter
The multiplication of the matrices is
1 2 3      0 2.0 4.0      5.3 23.9 24
4 5 6      * 1 4.5 2.2 = 11.6 56.3 58.2
7 8 9      1.1 4.3 5.2 111.9 88.7 92.4
```