Programming assignment 1.

Due date: Monday, August 30, 2021 at 11:59pm

In this lab we practice writing simple functions in MATLAB

Remember:

- ✓ You can look up all the functions in matlab by typing help/doc in the command window. (e.g. doc sort)
- ✓ "clear": removes all the variables from the workspace
- ✓ "who": gives the list of variables in your active workspace
- ✓ "whos": gives you the list of variables, their sizes, and types in your active workspace

---

Part A

Define the below matrices:

$$A = \begin{bmatrix} 1 & -2 & 4 & 5 \\ 3 & -1 & 9 & -7 \\ 8 & 5 & 4 & 0 \\ 0 & -3 & 2 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 3 & 1 & 2 & 7 \\ 4 & 6 & 5 & 0 \\ -1 & 3 & 2 & 5 \\ -6 & -13 & 0 & -2 \end{bmatrix}$$

1. How many rows A has?
2. Show the whole first to third rows of A?
3. Show the sub-matrix of A starting from second row to the last row, and third column to the fourth one.
4. Add 10 to the first row of B, then add the first row to the second row (row1 = 10 + row1, row2 = row1 + row2). Next replace the first row of A with the second row of B.
5. Find the elements of A less than 5 and greater or equal to -2. What are their indices?
6. Find the first 6 indices corresponding to the nonzero entries of A.
7. What is the smallest, largest, and average value of A?
8. Write a vector with equally spaced elements from 5 to 0, with a step of 0.3, but in decreasing order. What will be the size?
9. Create a 3x4 matrix of random numbers between 0 and 1

Part B

Implement *binarySearch(a,key)* function.

1. Request the user to enter a positive integer, and call it **n**.
2. Generate **n** random integers between *-10* to *10* and save them in array **a**.
3. Sort **a** and print the values.
4. Request the user to enter a positive integer and call it **key**.
5. Call the binary search algorithm to search for the key in **a**.