1. Create a new script (`lab1.m`) and define variable \( A \), \( b \), and \( c \):

\[
A = \begin{bmatrix}
1 & 1 & 1 \\
1 & 2 & 3 \\
1 & 2 & 3 \\
1 & 2 & 1 \\
\end{bmatrix}, \quad b = \begin{bmatrix}
2 \\
5 \\
6 \\
\end{bmatrix}, \quad c = \frac{2}{3}.
\]

2. Solve the \( Ax = b \) linear equation system and print \( x \). (help)

3. Multiply the last row of \( A \) and the last element of \( b \) by \( c \). Solve the linear equation system again and print \( x \). What do you expect? Why?

4. Print the maximal eigenvalue and the corresponding eigenvector of matrix \( A \). (help)
   a. You can use the `diag` function to retrieve diagonal elements of a matrix.

5. Plot and save into variable \( xt \) the sine function over the domain \(-2\pi < t < 2\pi\).
   a. Use the colon (:) operator.
   b. The increment between the elements should be 0.01.
   c. Use the \pi constant.

6. Add Gaussian noise \( N(\mu, \sigma) \), \( \mu = 0 \) and \( \sigma = \frac{1}{3} \) to variable \( xt \) and plot again.
   a. Use `randn` to generate normally distributed random numbers

7. Given the vector \( s = [1 \ 8 \ 3 \ 9 \ 0 \ 1] \), create a short set of commands that will compute the running sum (for element \( j \), the running sum is the sum of the elements from 1 to \( j \), inclusive. Check with `cumsum`.)
   a. Use `for` loop

8. Write function \([\text{value}] = \text{calcPi}(K)\) that calculates the value of \( \pi \) using the following series:

\[
\pi = \sum_{k=0}^{\infty} \frac{1}{16^k} \left( \frac{4}{8k + 1} - \frac{2}{8k + 4} - \frac{1}{8k + 5} - \frac{1}{8k + 6} \right)
\]

9. Write a script or a function that finds how many terms are needed to obtain an accuracy of \( 1e-12 \).
   a. Use the \pi constant as reference.