

ASSIGNMENT 2

Due September 12, 2024 at 5pm

Please complete the following steps in MATLAB:

1. Create a script called "LastNameLab2" (e.g. AnastasiadisLab2 for me).
2. Write a for loop (i.e create a "loop" function) which will calculate the norm (magnitude) of any vector \vec{v} . This means you'll need one output (the norm of the vector) and one input (the vector \vec{v}). You can name your function whatever like. I will call it "magn". You are not allowed to use the `norm(.)` command which directly gives the norm. You need to create the function which computes the norm. Recall that if $\vec{v} = (v_1, v_2, \dots, v_n)$ then the norm of the vector is equal to $\sqrt{v_1^2 + v_2^2 + \dots + v_n^2}$. Hint: The exercise is very similar to the one we did in class with the dot product.
3. Test your function on the vector $\vec{v} = (1, 3, 4, 5)$, i.e compute the value of the function on that particular vector. Then, check the accuracy of your program by using MATLAB's built-in norm function, i.e compute `norm(v)` and verify that the two results are equal.
4. Create an $n \times n$ matrix with entries $110, 320, 530, \dots, (210n - 100)$ on the main diagonal and zeros everywhere else. Name your function as you wish...I'll use "mydiagmat". As an example, when I evaluate `A = mydiagmat(4)`, MATLAB produces the following matrix:

$$\begin{pmatrix} 110 & 0 & 0 & 0 \\ 0 & 320 & 0 & 0 \\ 0 & 0 & 530 & 0 \\ 0 & 0 & 0 & 740 \end{pmatrix}$$

This is just an example for $n = 4$, you need to define this type of matrix for a general dimension n . The exercise is very similar to the one with the "mymat" function that we did together in class.

5. Test your program using $n = 3$ and $n = 5$, being sure to display your results.
6. Run all the sections, save your script, export it as a pdf with the appropriate name and submit it on Blackboard.