

Project 1 report

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ECE-3723

Introduction

This project is to introduce the basic steps to work with MATLAB. Through this project, we will learn about how to use functions, how to declare the variables, vector, matrices, how to do the calculate with those variables, vector and matrices. Finally, we can use the data that assigned to make a plot.

Procedure

Question 1: What do these functions do?

The function `clear all` is to clear all data stored to a variable (clear workspace).

The function `close all` is to close all open MATLAB figure windows.

Command `clc` is to clear the command window.

Question2: What is the output in the command window?

$y = 133.0030$

Question 3: What does the semicolon do to the output of the script?

The semicolon is suppressing or hiding the MATLAB output.

Question 4: Is this a row or a column vector?

This is a row vector.

Question 5: What do the semicolons do in this case?

These semicolons create the new rows

Question 6: Does the order matter? i.e., $v1*v2$ vs. $v2*v1$, explain why?

Yes, because the size of $v1$ is 1×4 and the size of $v2$ is 4×1 matrix, so if we take $(1 \times 4) * (4 \times 1)$, we will create the new matrix with size 1×1 . If we take $(4 \times 1) * (1 \times 4)$, we will create a new matrix with size 4×4 .

Question 7: What are the input parameters for these functions? How do they differ between the two methods?

The inputs of the function $v = 1:1:4$ is 1, 1, 4.

The inputs of the function $v = \text{linspace}(1,4,4)$ is 1, 4, 4.

The difference between these 2 functions in general is that the function $v = i:j:k$ creates a regularly spaced vector v using j as the increment between elements. However, the function $\text{linspace}(x1,x2,n)$ generate n points and the space between the point is $(x2-x1)/(n-1)$.

Question8: What is the purpose of choosing 121 in this equation (as opposed to any other number)?

The purpose of choosing 121 is to make the spaced numbers look nice and easy for us to do the plot.

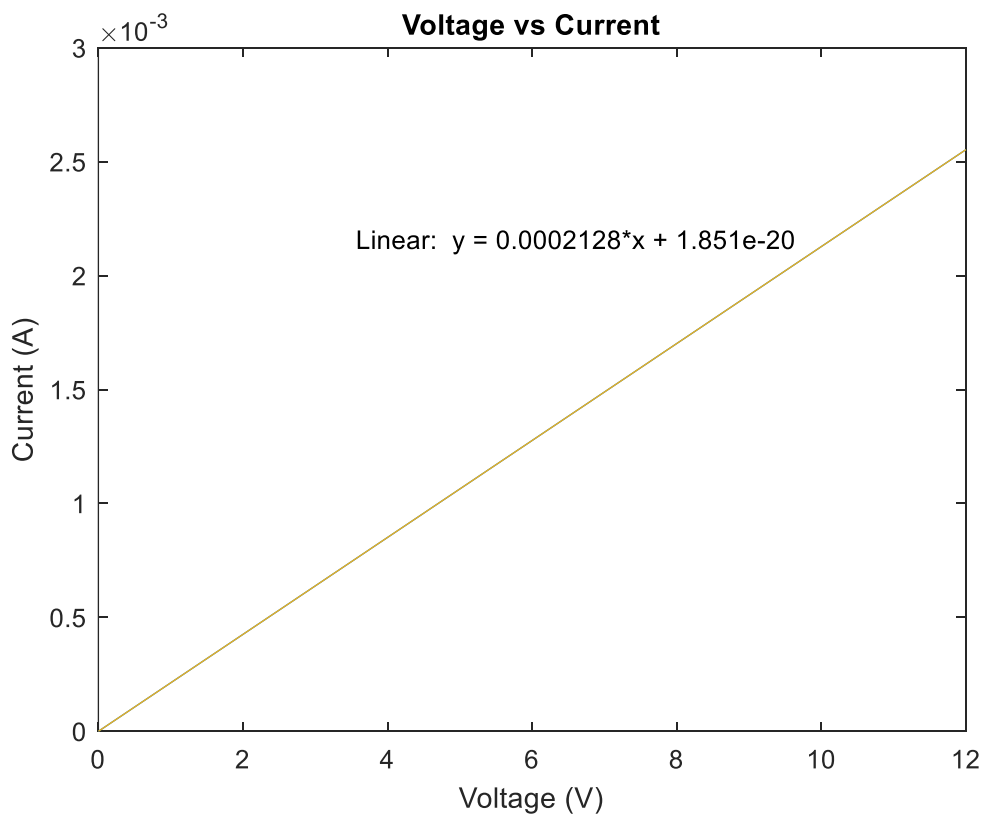
Question 9: What happens when you run the script?

The command window will show the result of current i by matrix with size 1×121 . In the other words, to get the current i , MATLAB divides each element of v in matrix by R .

Question 10: What is the voltage and current when $n = 89$?

$$v(89) = 8.8000 \text{ V}$$

$$i(89) = 0.0019 \text{ A}$$



Conclusion

This project helped us to understand MATLAB. Through this project, we are able to assign the new variables, create the vector or matrices manually or functionally. We are also able to do complicated calculations and make the 2D plot for the equation. Briefly, this project equips us with the basic skills to do the next projects.

Appendix

Question 1: What do these functions do?

```
close all
clear all
clc
```

Question2: What is the output in the command window?

```
y = 2*3^2*exp(2)
y =
```

```
133.0030
```

Question 3: What does the semicolon do to the output of the script?

```
x=2
y = x*3^x*exp(x);
y =
```

```
133.0030
```

Question 4: Is this a row or a column vector?

```
v1 = [1 2 3 4]
v1 =
```

```
1    2    3    4
```

Question 5: What do the semicolons do in this case?

```
v2 = [1; 2; 3; 4]
v2 =
```

```
1
2
3
4
```

Question 6: Does the order matter? i.e., $v1*v2$ vs. $v2*v1$, explain why?

```
v1*v2
ans =
```

```
30
```

```
v2*v1
ans =
```

```
1  2  3  4
2  4  6  8
3  6  9  12
4  8  12 16
```

Question 7: What are the input parameters for these functions? How do they differ between the two methods?

```
v1 = 1:1:4
```

```
v1 =
```

```
1 2 3 4
```

```
v1 = linspace(1,4,4)
```

```
v1 =
```

```
1 2 3 4
```

Question8: What is the purpose of choosing 121 in this equation (as opposed to any other number)?

```
v = linspace(0,12,121)
```

```
v =
```

Columns 1 through 10

```
0 0.1000 0.2000 0.3000 0.4000 0.5000 0.6000 0.7000 0.8000 0.9000
```

Columns 11 through 20

```
1.0000 1.1000 1.2000 1.3000 1.4000 1.5000 1.6000 1.7000 1.8000 1.9000
```

Columns 21 through 30

```
2.0000 2.1000 2.2000 2.3000 2.4000 2.5000 2.6000 2.7000 2.8000 2.9000
```

Columns 31 through 40

```
3.0000 3.1000 3.2000 3.3000 3.4000 3.5000 3.6000 3.7000 3.8000 3.9000
```

Columns 41 through 50

```
4.0000 4.1000 4.2000 4.3000 4.4000 4.5000 4.6000 4.7000 4.8000 4.9000
```

Columns 51 through 60

```
5.0000 5.1000 5.2000 5.3000 5.4000 5.5000 5.6000 5.7000 5.8000 5.9000
```

Columns 61 through 70

```
6.0000 6.1000 6.2000 6.3000 6.4000 6.5000 6.6000 6.7000 6.8000 6.9000
```

Columns 71 through 80

```
7.0000 7.1000 7.2000 7.3000 7.4000 7.5000 7.6000 7.7000 7.8000 7.9000
```

Columns 81 through 90

```
8.0000 8.1000 8.2000 8.3000 8.4000 8.5000 8.6000 8.7000 8.8000 8.9000
```

Columns 91 through 100

```
9.0000 9.1000 9.2000 9.3000 9.4000 9.5000 9.6000 9.7000 9.8000 9.9000
```

Columns 101 through 110

10.0000 10.1000 10.2000 10.3000 10.4000 10.5000 10.6000 10.7000 10.8000 10.9000

Columns 111 through 120

11.0000 11.1000 11.2000 11.3000 11.4000 11.5000 11.6000 11.7000 11.8000 11.9000

Column 121

12.0000

Question 9: What happens when you run the script?

$R = 4.7e3$

$R =$

4700

$i = v./R$

$i =$

Columns 1 through 10

0 0.0000 0.0000 0.0001 0.0001 0.0001 0.0001 0.0001 0.0002 0.0002

Columns 11 through 20

0.0002 0.0002 0.0003 0.0003 0.0003 0.0003 0.0003 0.0004 0.0004 0.0004

Columns 21 through 30

0.0004 0.0004 0.0005 0.0005 0.0005 0.0005 0.0006 0.0006 0.0006 0.0006

Columns 31 through 40

0.0006 0.0007 0.0007 0.0007 0.0007 0.0007 0.0008 0.0008 0.0008 0.0008

Columns 41 through 50

0.0009 0.0009 0.0009 0.0009 0.0009 0.0010 0.0010 0.0010 0.0010 0.0010

Columns 51 through 60

0.0011 0.0011 0.0011 0.0011 0.0011 0.0012 0.0012 0.0012 0.0012 0.0013

Columns 61 through 70

0.0013 0.0013 0.0013 0.0013 0.0014 0.0014 0.0014 0.0014 0.0014 0.0015

Columns 71 through 80

0.0015 0.0015 0.0015 0.0016 0.0016 0.0016 0.0016 0.0016 0.0017 0.0017

Columns 81 through 90

0.0017 0.0017 0.0017 0.0018 0.0018 0.0018 0.0018 0.0019 0.0019 0.0019

Columns 91 through 100

0.0019 0.0019 0.0020 0.0020 0.0020 0.0020 0.0020 0.0021 0.0021 0.0021

Columns 101 through 110

0.0021 0.0021 0.0022 0.0022 0.0022 0.0022 0.0023 0.0023 0.0023 0.0023

Columns 111 through 120

0.0023 0.0024 0.0024 0.0024 0.0024 0.0024 0.0025 0.0025 0.0025 0.0025

Column 121

0.0026

Question 10: What is the voltage and current when $n = 89$?

$v(89)$

ans =

8.8000

$i(89)$

ans =

0.0019