Chart, funnel chart

Description automatically generated

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| --- | --- |
| Course Number | ELE532 |
| Course Title | Signals and Systems I |
| Semester/Year | F2022 |
| Instructor | Dimitri Androutsos |
| TA Name | Sarina Taki |
| Section No. | 08 |
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|  |  |  |
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# Introduction

The objective of this lab is to use Matlab functions to manipulate signals by time shifting, scaling and/or reversing.

# Lab Results

Text

Description automatically generated with low confidence

1.46:

Chart, line chart

Description automatically generated

1.47:

A picture containing graphical user interface

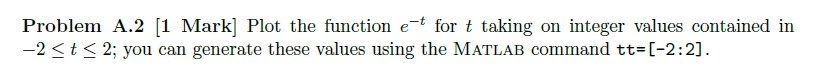
Description automatically generated

Text, letter

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Chart, line chart

Description automatically generated



Text

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Chart, line chart

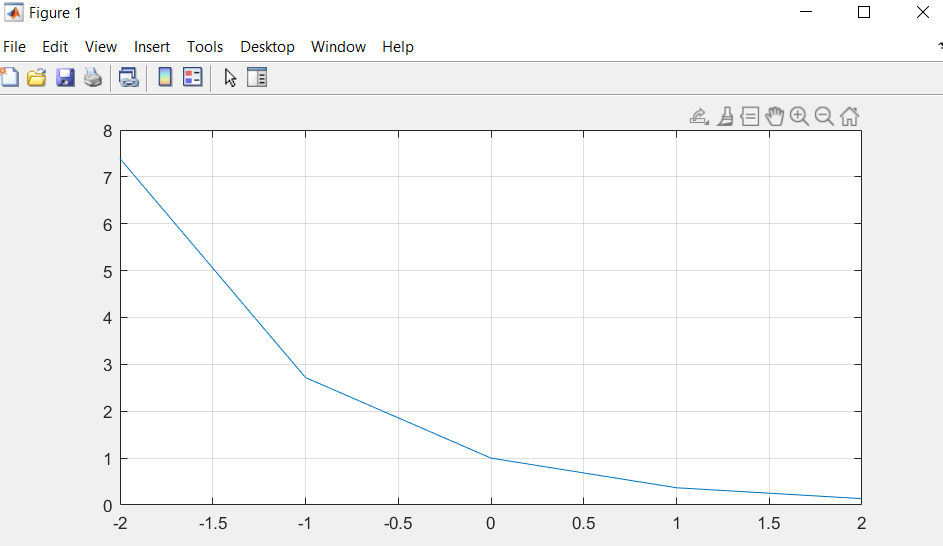
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Chart, line chart

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A1-1.46



A2

The graphs are very similar, in fact they are identical, as cos(2\*pi\*t) is one for all integer values in the range t = [-2:2] meaning at these points the graph at A1-1.46 is f(t) = e-t \*(1) which is the same function for A2 f(t) = e-t thus both functions resulted in the same graph for integer values in the range t = [-2:2].

A picture containing text

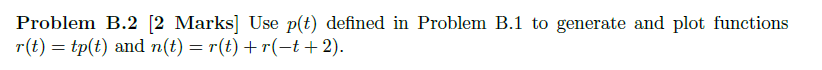
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Text, letter

Description automatically generated

Chart, histogram

Description automatically generated



Text, letter

Description automatically generated

Chart, line chart

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Text, letter

Description automatically generated

Chart, line chart

Description automatically generated

Text

Description automatically generated

Chart, line chart

Description automatically generated

A screenshot of a computer

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Chart, line chart

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Text, letter

Description automatically generatedChart, line chart

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Chart, line chart

Description automatically generatedChart, line chart

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Both graphs were manipulated by the same factors (expanded by a factor of 2 on x axis and shifted by a ½ and ¼ to the right respectively) however n2 was expanded then shifted while n4 was shifted then expanded. This resulted in same overall transformations, where both resultant graphs are the same.



Text

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Chart, line chart

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Text

Description automatically generated with low confidence

Chart, line chart

Description automatically generated

Text

Description automatically generated

Text, letter

Description automatically generated

Chart, line chart

Description automatically generated

Using a loop:

Text

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Chart, line chart

Description automatically generated



S1 [0 : 0:01 : 4]

S3 [0 : 0:01 : 4]



S5 [0 : 0:01 : 4]

S7 [0 : 0:01 : 4]

4x 401 = 1604

Graphical user interface, text, application, table

Description automatically generated

1. A( : ) returns all the values in the matrix in order
2. A([ 2 4 7 ]) returns the values at position 2 4 7
3. [ A >= 0.2 ] returns a 5 x 4 matrix with 1 (true) in each cell that has a value greater than or equal to 0.2 and 0 (false) in each cell that doesn’t
4. A([ A >= 0.2 ]) returns the number in the matrix with values greater than or equal to 0.2 in order
5. A([ A >= 0.2 ])=0 returns matrix A but with all values greater than or equal to 0.2 set to 0

Order in a matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1st | 6th | 11th | 16th |
| 2nd | 7th | 12th | 17th |
| 3rd | 8th | 13th | 18th |
| 4th | 9th | 14th | 19th |
| 5th | 10th | 15th | 20th |

A picture containing table

Description automatically generatedOutcome:

Table

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Text, Word

Description automatically generated Text

Description automatically generated

a)

Text, letter

Description automatically generated

b)



c)

Text

Description automatically generated

A picture containing graphical user interface

Description automatically generated

The single line command was 426.7% faster than the nested loop.

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Text, letter

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Text

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# Conclusion

At the end of the lab, Matlab functions where more familiar to work with, however I did not know how to save my commands in a file, but I had taken screenshots for them. The content of the lab was similar to the homework questions and the material taught in class, making the lab questions easy to understand and follow.