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 learn how to use Fourier series in the analysis and synthesis of periodic signals while continuing to learn how to use Matlab effectively.

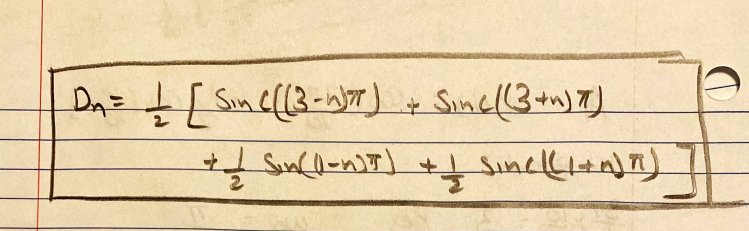
# Lab Results

A picture containing chart

Description automatically generated

Text, letter

Description automatically generated

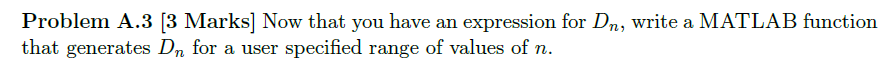


Chart, box and whisker chart

Description automatically generated

A piece of paper with writing on it

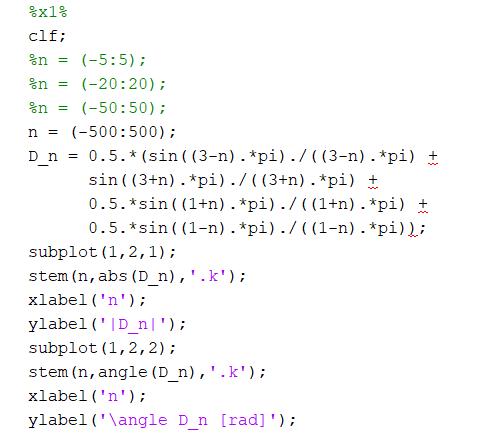
Description automatically generated with medium confidence

Text

Description automatically generated

Text

Description automatically generated



a) Chart, histogram

Description automatically generated

b)

Chart

Description automatically generated

c)

Chart, histogram

Description automatically generated

d)

Graphical user interface, chart, histogram

Description automatically generated

Text

Description automatically generated

a) Chart, histogram

Description automatically generated

b) Chart, histogram

Description automatically generated

c) Chart, histogram

Description automatically generated

d) Chart

Description automatically generated

Text

Description automatically generated

a) Chart, histogram

Description automatically generated

b) Chart, histogram

Description automatically generated

c) Chart, histogram

Description automatically generated

d) Chart

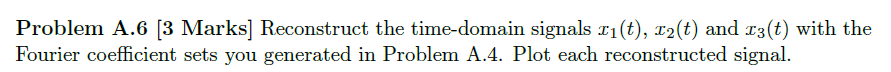
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Text

Description automatically generated

Graphical user interface, text, application, chat or text message

Description automatically generated



X1(t):

Chart, bar chart

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X2(t):

Chart, bar chart, histogram

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# Conclusion

B1:

A picture containing text, parking, flock, document

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B2: The main difference between the coefficients of x1 and x2 is x1 has 4 distinct coefficients while x2 has infinite coefficients. Also, x1 is made of sinc functions while x2 is made of sin functions

B3: x3 has smaller fundamental frequency compared to that of x2

B4: x4 is x2 shifted thus D0 is 0.5

B5: for x2 as number of coefficients increase the graph would look more accurate however for x1 there is only 4 discrete coefficients so it will not make a difference

B6: for x2 and x3 we would need an infinite number of coefficients to perfectly reconstruct the graphs however for x1 we only need the 4 distinct coefficients

B7: no since it will vastly depend on the signal. if it has infinite coefficients such as x2 and x3 it would take up a lot of space and would be impossible to perfectly reconstruct it, but if it is like x1 then it is possible, but it is not recommended as it will still need more time to reconstruct it than just save the function and run it.