

Report for Lab #1: Introduction to Matlab

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1 EXECUTIVE SUMMARY

This lab introduces basic vector and matrix operations, plotting, and sound vector manipulation. In the Prelabs, we learned how to set up new folders and files in U-drive, found out the relation between F_s and T_s , and how to plot multiple graphs in one window as well as how to display sound vectors in MatLab. During the lab, we worked on several exercises on these topics, especially matrix manipulation and plotting. This lab is especially helpful for discrete signal manipulations, which is a counterpart of continuous signals covered in lectures.

2 EXERCISE #1: M-FILES

This exercise helps to define a new m-file, and create basic vectors and matrices and basic operations

2.1 COMMAND WINDOW OUTPUT

```
>> Ex1
```

```
c =
```

```
6
```

```
c1 =
```

```
6
```

```
2
```

d =

9

z =

1 1 1

3 6 9

0 -1 -1

e =

1

>>

3 EXERCISE #2: DIFINIG SIGNALS

This exercise tells us how to define time intervals, functions, and how to access the function at given time / time interval.

3.1 COMMAND WINDOW OUTPUT (IF APPLICABLE)

In this section, copy and paste any command window output from Matlab

>> Ex2

w1 =

-7

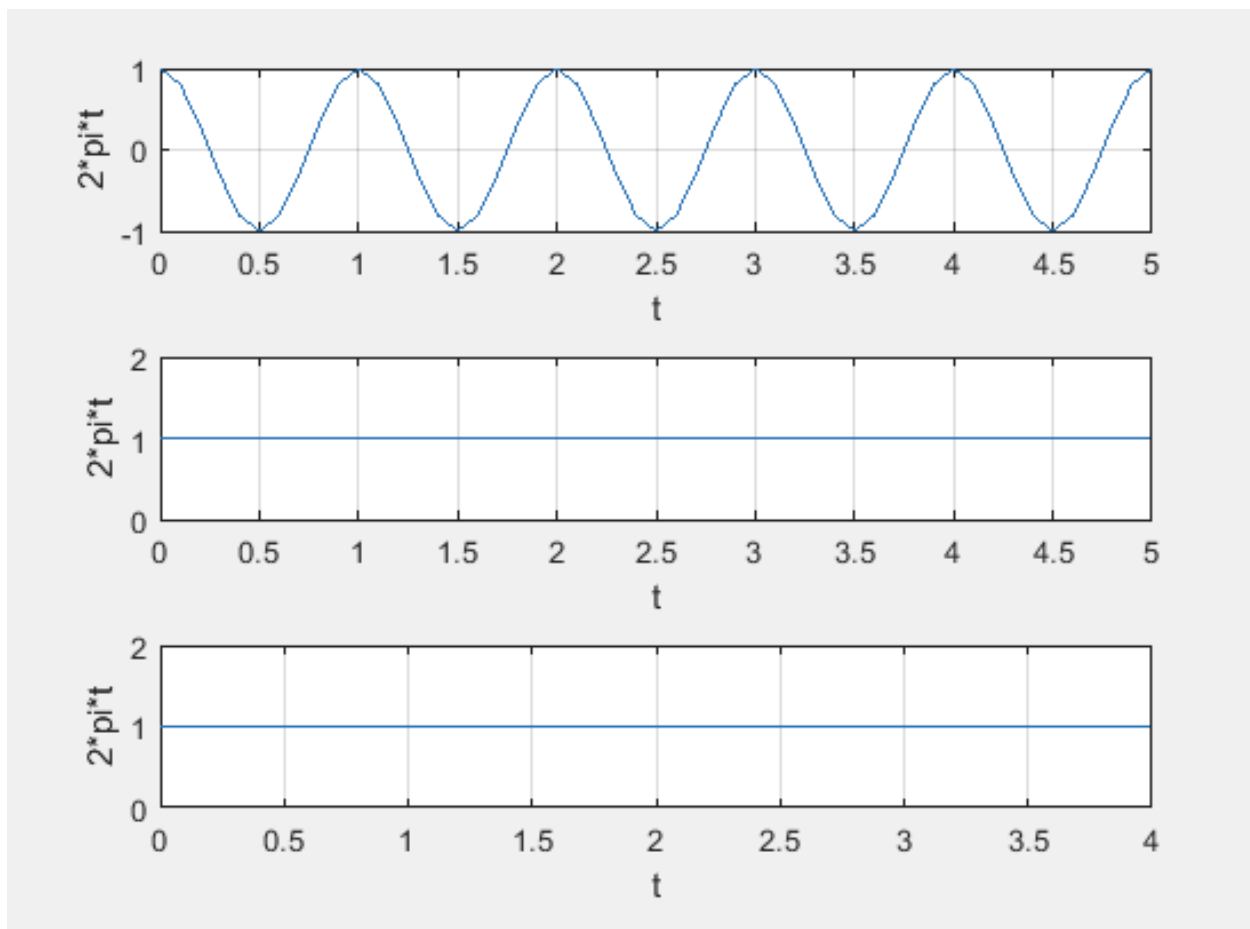
w2 =

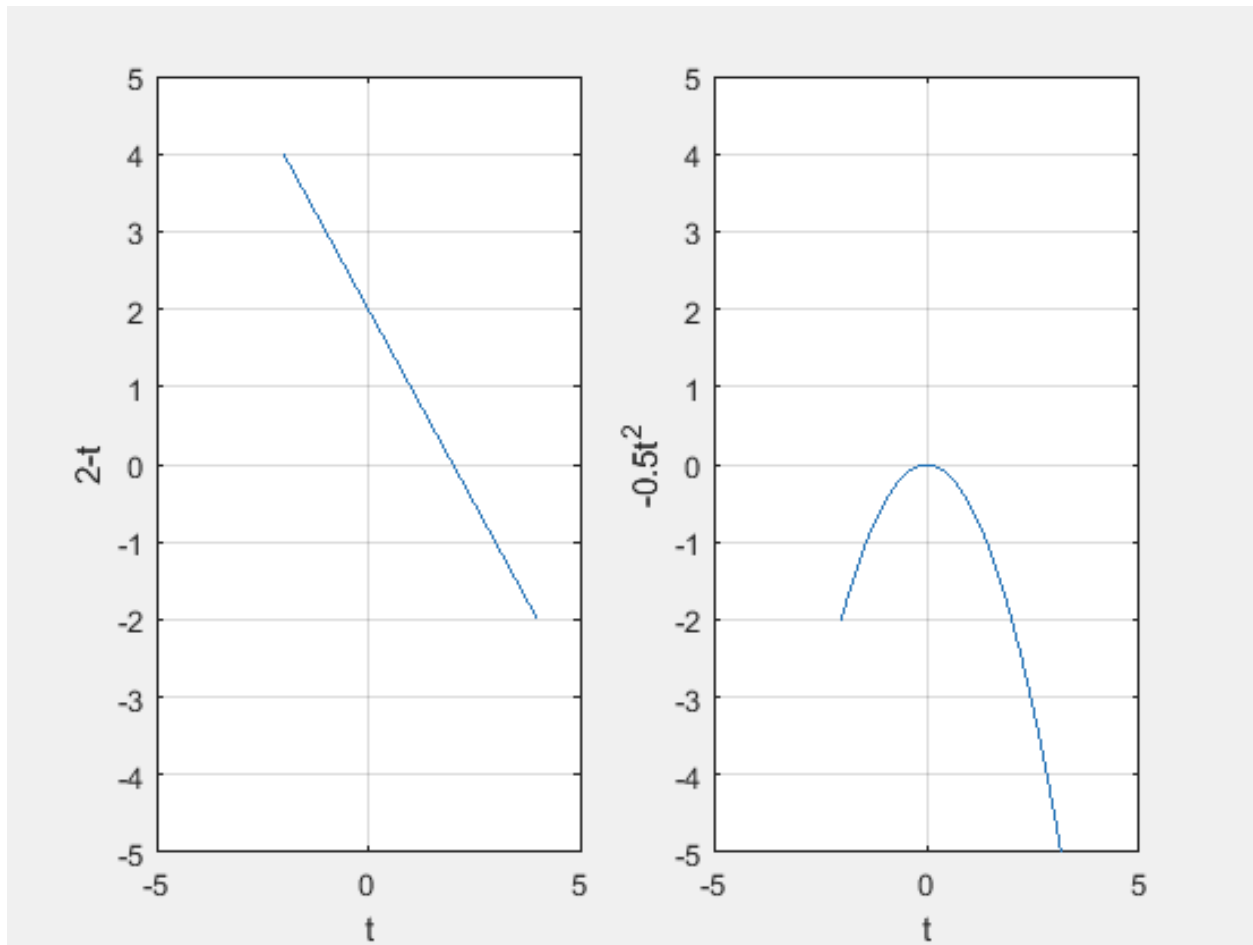
0 -0.2500 -1.5000 -3.7500

4 EXERCISE #3: PLOTTING FUNCTIONS

This exercise tells us how to divide plotting windows, set up limits , plot functions and label x and y properly.

4.1 PLOTS





4.2 LAB REPORT QUESTIONS

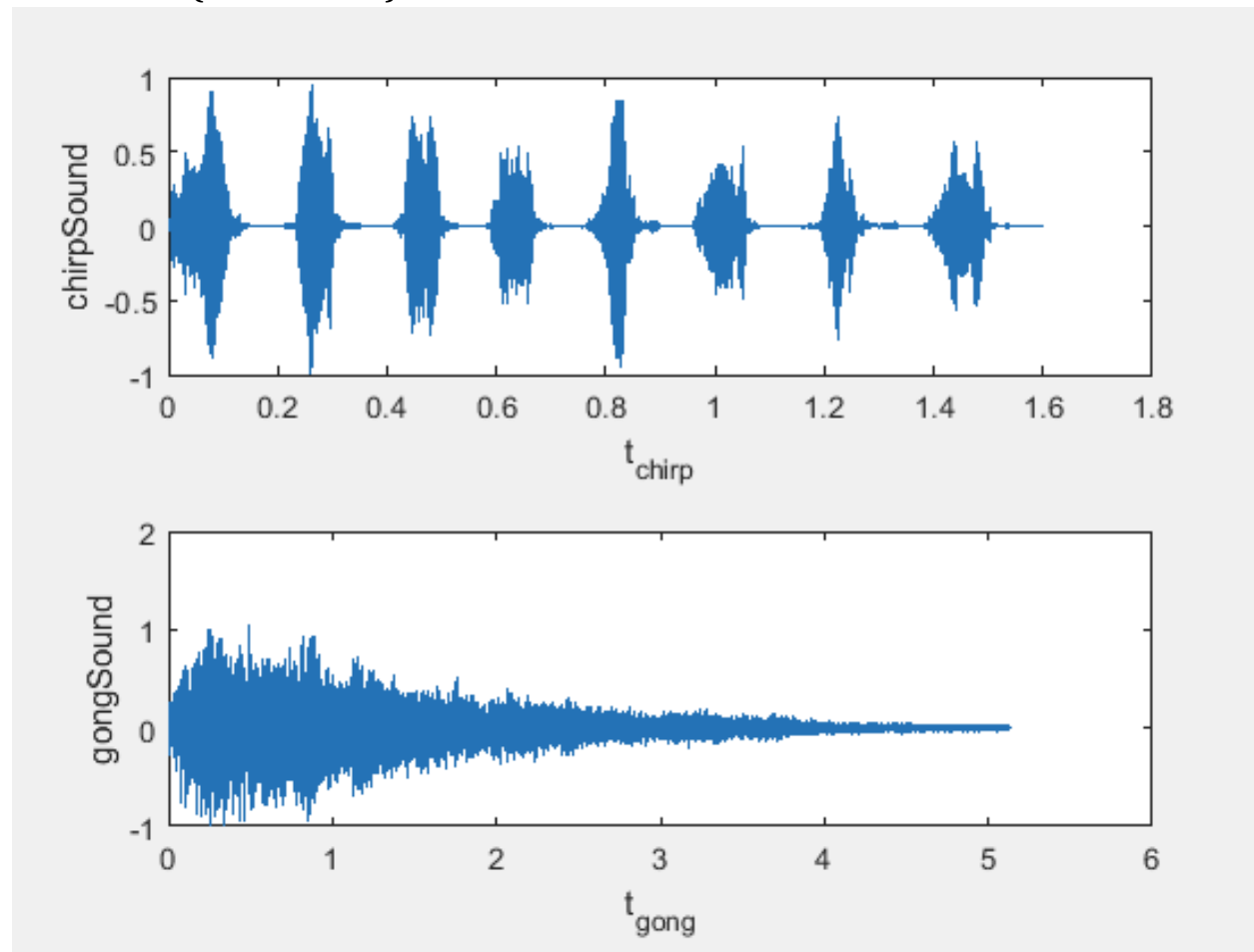
Comment on why the cosine frequency would influence your choice of F_s . Include the 3x1 plot in your lab report.

In this case, $f = 2\pi / 2\pi = 1$. Since $F_s = 1$, plot2 is picking all the $y=1$ points from the cosine curve. Since Matlab only connects dots with straight lines, the result is a $y=1$ straight line. This happens to plot3 as well. In order to avoid this, F_s must be bigger than f to get enough sample to form a curve, like plot1.

5 EXERCISE #4: [DIFINING SIGNALS]

In this exercise, we load two different sound files into the code, calculate the frequency for each, and plot them in a 2*1 window with proper labelings. We then use `sound()` function and `pause` command to play these sounds.

5.1 PLOTS (IF APPLICABLE)



5.2 LAB REPORT QUESTIONS

Try playing the sound files with a different F_s and without specifying F_s . Comment on the effect of changing F_s in your report.

Changing F_s changes the pitch of the sample sounds. Removing specifying F_s doesn't change the result noticeably.