

MATH 375 - Intro to Numerical Computing

Homework 0

September 5, 2022

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This file demonstrates how to use the tool and these comments. For more information visit:

Printing out pi

```
pi  
disp(pi)  
fprintf("%.69f\n", pi);  
  
ans =  
  
3.1416  
  
3.1416  
  
3.14159265358979311599796346854418516159057617187500000000000000000000
```

As you probably noticed, the result of running the previous section is displayed right below the code chunk. Now isnt that so nice?

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Advanced MATLAB Script

We will be going over more advanced matlab topics and how they are displayed

Making a table

Not much to see here, fairly simple

```
x = linspace(0, 25, 20);
calculated_cosine = cosine(x);

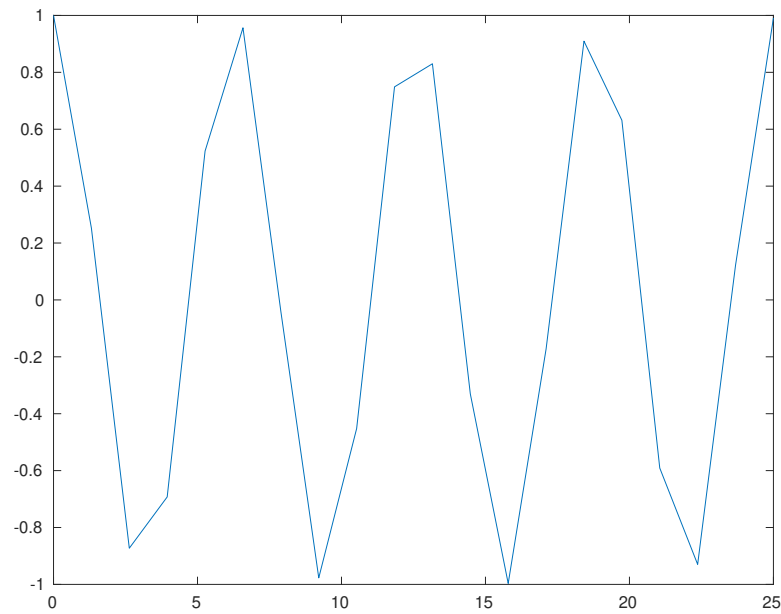
% this table is output in markdown form so you should probably go use a
% markdown renderer if it needs to be pretty
fprintf("| x | cos(x) |\n");
fprintf("|---|---|\n");

for i = 1:length(x)
    fprintf("| %.4f | %.4f |\n", x(i), calculated_cosine(i));
end
```

Making a chart

Lets chart it!

```
plot(x,calculated_cosine);
```

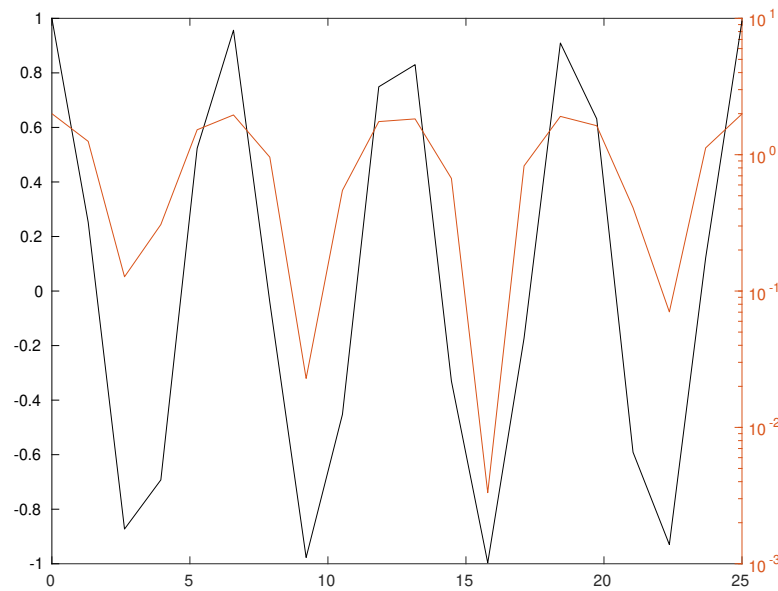


Different plotting styles

That was trash, lets see if log scale is better

```
yyaxis left
plot(x,calculated_cosine);

% we will add one so that the cosine is always positive and thus can be
% plotted
yyaxis right
semilogy(x,1+calculated_cosine);
```



Add more x values

maybe if we did a bigger `linspace` it would work

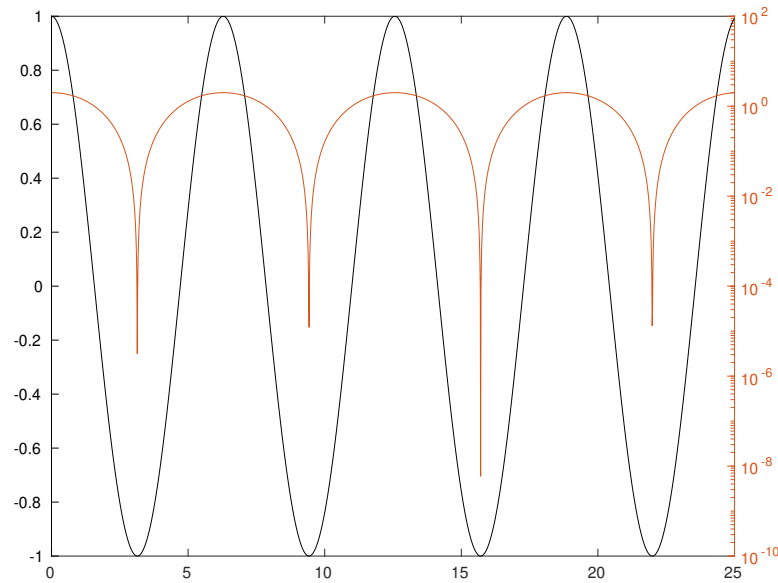
```
x = linspace(0, 25, 2000);
calculated_cosine = cosine(x);
```

Replotting

Now we will re-plot with the new x values

```
yyaxis left
plot(x,calculated_cosine);
```

```
% we will add one so that the cosine is always positive and thus can be
% plotted
yyaxis right
semilogy(x,1+calculated_cosine);
```



Functions

Here follows some helper functions.

cosine

We include that since we want it to show up underneath the functions subsection. Anyway this function is a wrapper for the cosine function. Totally useless but I included it for demo purposes

```
function Y = cosine(x)
    Y = cos(x);
end
```

x	cos(x)
0.0000	1.0000
1.3158	0.2523
2.6316	-0.8727
3.9474	-0.6926
5.2632	0.5233
6.5789	0.9566
7.8947	-0.0407
9.2105	-0.9771
10.5263	-0.4522

	11.8421		0.7490	
	13.1579		0.8301	
	14.4737		-0.3302	
	15.7895		-0.9967	
	17.1053		-0.1726	
	18.4211		0.9096	
	19.7368		0.6315	
	21.0526		-0.5910	
	22.3684		-0.9297	
	23.6842		0.1220	
	25.0000		0.9912	

Conclusion

Thanks for playing. Remember to like an subscribe.