Nolan Anderson

EE 384

Classwork 0

Due 22 August 2021

Notes

```
clc % clear the command window
clear all % clears the workspace
close all % close all plots / figures
```

Variable Declaration

```
avector = [2 : 5 : 8];  %: starts a new row.
bvector = [3 : 13 : 8];
new_avector = [1 2 -3 : 2 1 2 : 4 -2 1];
```

Problem 1.1

```
a = avector + bvector  %add
%b = avector * bvector   % INVALID EXPRESSION: multiply, does not work see Linear algebra
% rows must equal number of columns
c = avector .* bvector  % element wise multiplication.
```

```
a =

     5    10


c =

     6    21
```

Problem 1.2

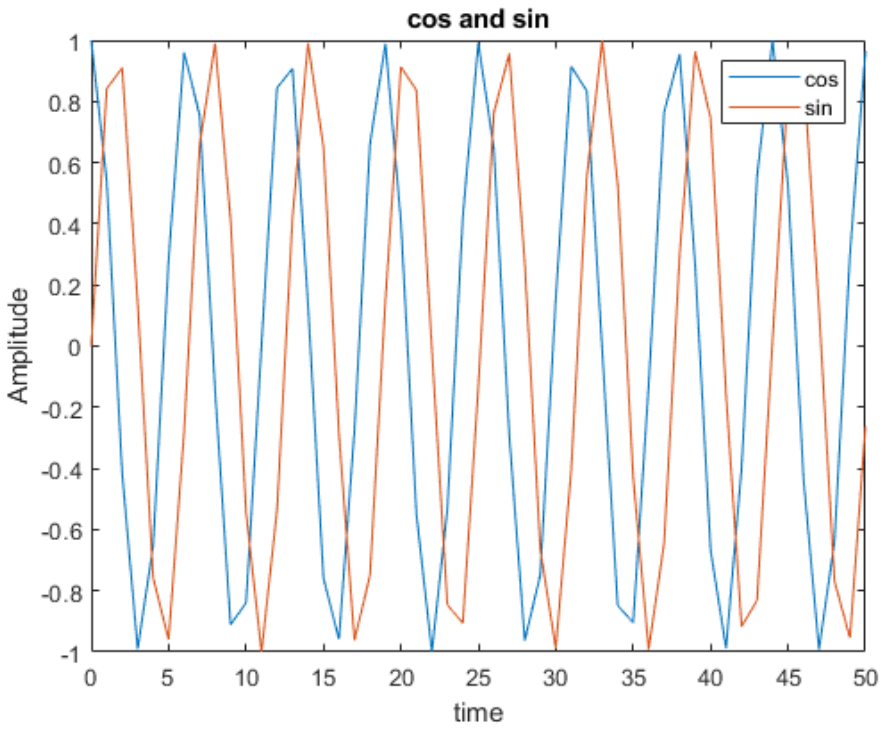
```
a2 = new_avector + bvector  % invalid
b2 = new_avector * bvector
c2 = new_avector .* bvector % invalid
```

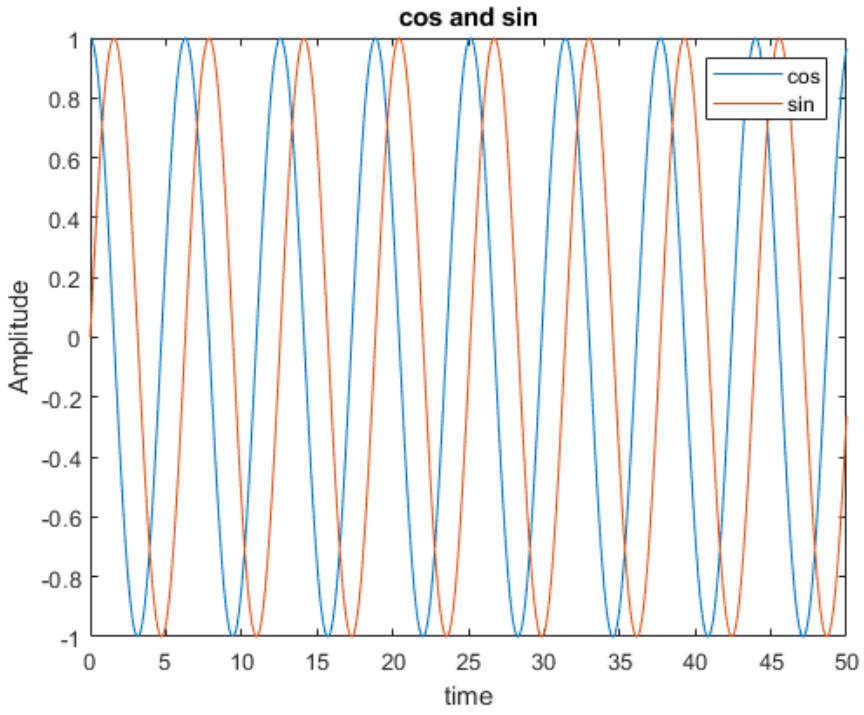
```
a2 =

  Columns 1 through 13

     4     5     0     1     2     3     4     5     4     5     6     7     1
```

```
  Column 14

     4


b2 =

  Columns 1 through 13

     3     6    -9    -6    -3     0     3     6     3     6     9    12    -6

  Column 14

     3


c2 =

  Columns 1 through 13

     3     6    -9    -6    -3     0     3     6     3     6     9    12    -6

  Column 14

     3
```

Problem 2

```
t = 0:50;       % Default increasing step of 1.
t2 = 0:0.01:50;

figure; y1 = cos(t); y2 = sin(t);
plot(t, y1, t, y2);
legend('cos', 'sin');
xlabel('time'), ylabel('Amplitude'), title('cos and sin');

figure; y1 = cos(t2); y2 = sin(t2);
plot(t2, y1, t2, y2);               % This figure is much smoother as there are more values.
legend('cos', 'sin');
xlabel('time'), ylabel('Amplitude'), title('cos and sin');
```





The second figure is smoother as there are more values to plot.

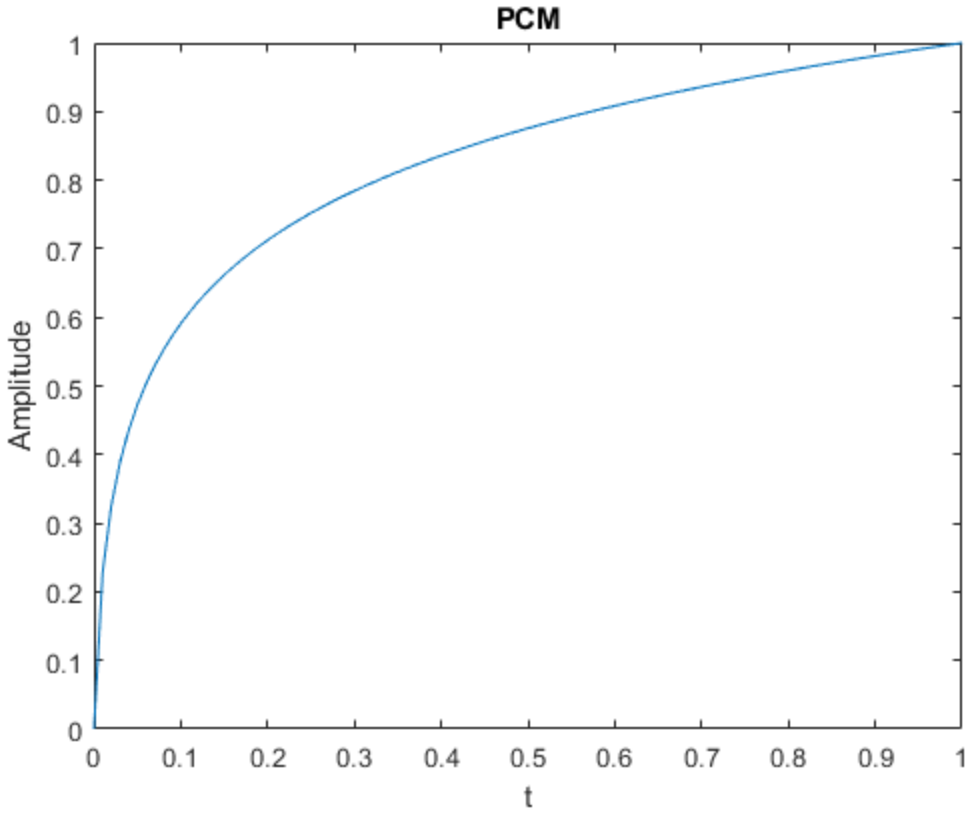
Problem 3

```
% a1 = input('Input the value of a1 ');
% a2 = input('Input the value of a2 ');
% a3 = input('Input the value of a3 ');
% b1 = input('Input the value of b1 ');
% b2 = input('Input the value of b2 ');
% b3 = input('Input the value of b3 ');
% c1 = input('Input the value of c1 ');
% c2 = input('Input the value of c2 ');
% c3 = input('Input the value of c3 ');
% d1 = input('Input the value of d1 ');
% d2 = input('Input the value of d2 ');
% d3 = input('Input the value of d3 ');

% A = [a1 a2 a3; b1 b2 b3; c1 c2 c3];
% D = [d1; d2; d3];

A2 = [2 3 1; 1 3 -1; 2 2 0];
D2 = [3; 6; 7];
result = inv(A2) * D2
```

```
result =

    4.0000
   -0.5000
   -3.5000
```

Problem 4

```
mu = 255;
x = 0:0.01:1;
y = (log(1 + mu * abs(x)) / log(1 + mu)) .* sign(x);

figure; plot(x,y)
xlabel('t'); ylabel('Amplitude');
title('PCM');
```



Published with MATLAB® R2019a