

MATLAB HOMEWORK 1

Jordan Lian

GE 1502 -- 308 Hurtig Hall

10:30 - 11:35am

Professor Whalen

Table of Contents

1. Voltage V_c t seconds after closing the switch in the circuit
2. Tension force vs distance on a beam
3. Production data for 4 electronic components
4. Voltage during the charging the capacitor



Voltage V_c t seconds after closing the switch in the circuit

m-file

%voltage vs time after closing the switch in the circuit

t = 8; %time

V = 36 * (1 - exp((0-t)*(10^6)/(2500*1600))); %voltage function

disp('The voltage (volts) 8 seconds after the switch is closed is');

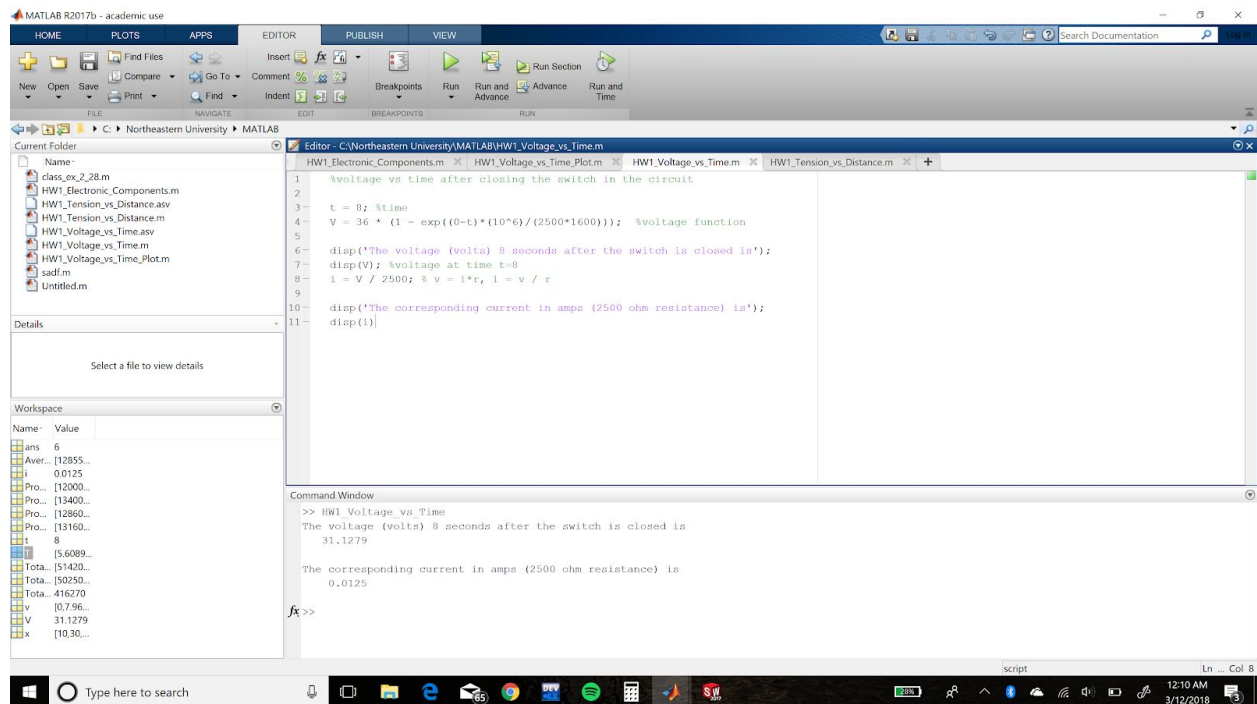
disp(V); %voltage at time t=8

i = V / 2500; % v = i*r, i = v / r

disp('The corresponding current in amps (2500 ohm resistance) is');

disp(i);

Command window results



Tension force vs distance on a beam

m-file

%tension vs distance

```

x = [10, 30, 50, 70, 90, 110]; %domain (array)
T = [0, 0, 0, 0, 0, 0]; %initialize
i = 1; %counter loop

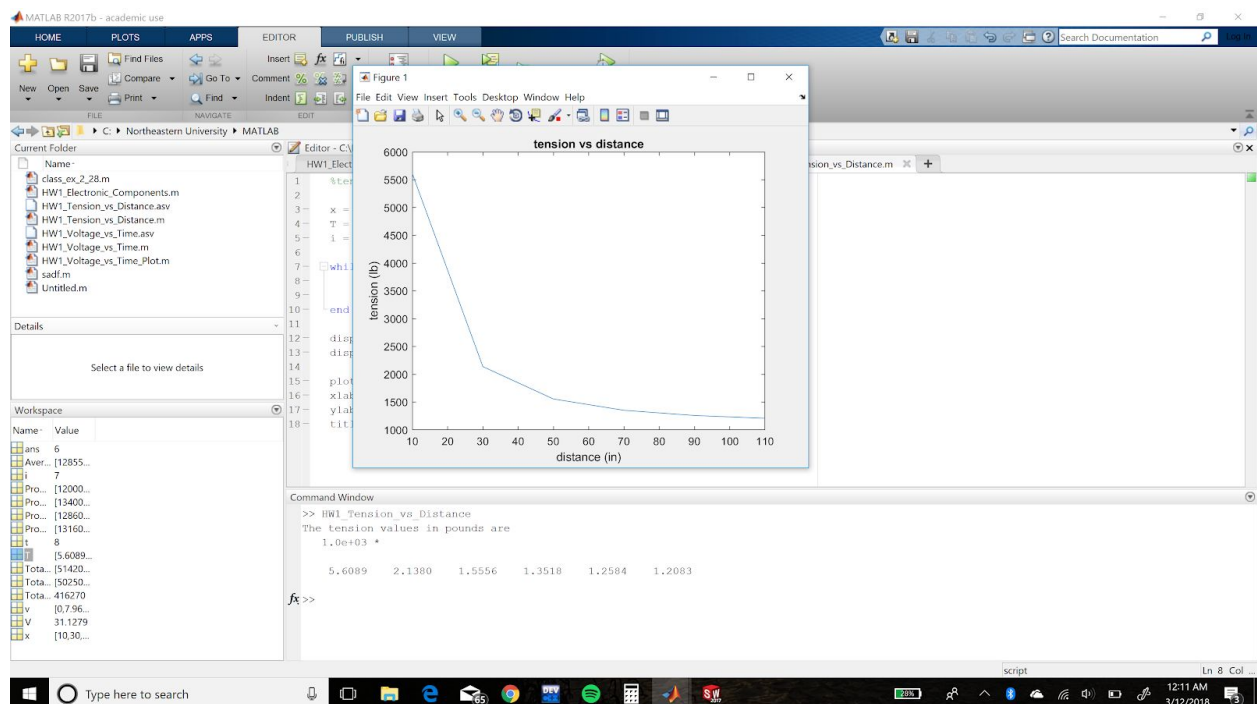
while i < 7 %calculate desired values
    T(i) = ((500*110) * sqrt(2500 + (x(i)*x(i)))) / (50*x(i)); %function
    i = i+1;
end

disp('The tension values in pounds are');
disp(T); %display output values

plot(x,T); %plot function
xlabel('distance (in)');
ylabel('tension (lb)');
title('tension vs distance');

```

Plot and command window results



Production data for 4 electronic components

M-file

```
Prod14 = [120000 235000 65000 82500];
```

```
Prod15 = [134000 262000 52800 78200];
```

```
Prod16 = [128600 245000 67300 80500];  
Prod17 = [131600 253900 61550 83400];
```

```
disp('The product vectors from 2014, 2015, 2016, and 2017 are');  
disp(Prod14);  
disp(Prod15);  
disp(Prod16);  
disp(Prod17);
```

```
Total_Product = Prod14 + Prod15 + Prod16 + Prod17;
```

```
disp('The sum of these vectors is');  
disp(Total_Product);
```

```
Average_Product = Total_Product([1:4]) / 4;
```

```
disp('The average product is');  
disp(Average_Product);
```

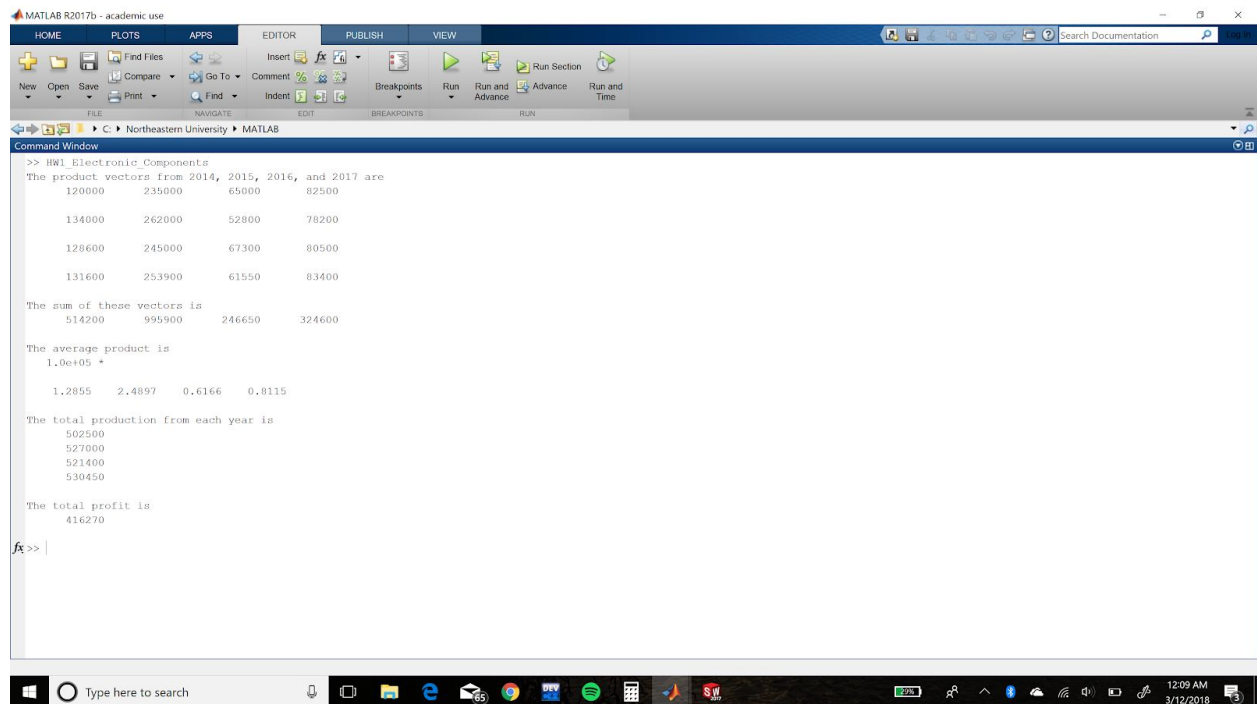
```
Total_Production = [sum(Prod14); sum(Prod15); sum(Prod16); sum(Prod17)];
```

```
disp('The total production from each year is');  
disp(Total_Production);
```

```
Total_Profit = sum(Total_Production) / 5;
```

```
disp('The total profit is');  
disp(Total_Profit);
```

Command window results



The image shows the MATLAB R2017b Command Window. The Command Window title bar indicates the file path: C:\> Northeastern University > MATLAB. The Command Window contains the following text:

```
>> HW1_Electronic_Components
The product vectors from 2014, 2015, 2016, and 2017 are
120000    235000    65000    82500
134000    262000    52800    78200
128600    245000    67300    80500
131600    253900    61550    83400

The sum of these vectors is
514200    995900    246650    324600

The average product is
1.0e+05 *
1.2855    2.4897    0.6166    0.8115

The total production from each year is
502500
527000
521400
530450

The total profit is
416270

fx>>
```

The MATLAB interface includes a menu bar (HOME, PLOTS, APPS, EDITOR, PUBLISH, VIEW), a toolbar, and a status bar at the bottom showing the Windows taskbar with various application icons and the system clock (12:09 AM, 3/12/2018).

Voltage during the charging the capacitor

m-file

%voltage vs time during the charging of a capacitor

t = [0.2 0.4 0.6 0.8 1.0]; %time values

V =[75.9 103.8 114.0 117.8 119.2]; %voltage values

plot(t,V);

xlabel('time (s)');

ylabel('voltage (V)');

title('voltage vs time during the charging of a capacitor');

Plot results

