

**-ECOR 1010 – INTRODUCTION TO ENGINEERING**

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**WALLINGFORD LISTER**

**ASSIGNMENT #8**

**Assignment Title: Programming With MATLAB**

**TO Marking TA:**

**Lab Section: L12**

**Room: ME 2256 – Carleton University**

**FROM:**

Number of Figures and Tables (Including handwritten ones): 5

Last Date and Time of Revision:

## APPENDICES- FIGURES AND TABLES

TABLE 1 QUESTION 1

```
function output=g(x,y)
%This function multiplies x and y together
%Be sure that x and y have the same size
x = [2;3;4];
y = [5;6;7];
a = x.*y;
table (x, y, a)

>> g

ans =

    3×3 table

     x     y     a
    —     —     —
     2     5     10
     3     6     18
     4     7     28
```

TABLE 2- QUESTION 2

```
function output=g(x,y)
%This function multiplies x and y together
%Be sure that x and y have the same size
%My Student Number is 101 103 993
x = [9;9;3]; %The last three digits are 9 9 3. Set them to be a matrix.
y = [2;1;4];
%The middle three digits plus 1 are 2 1 4. Set them to be a matrix.
a = x.*y.^3; %Programing language of xy^3
table (x, y, a)

>> g

ans =

    3×3 table

     x     y     a
    —     —     —
     9     2     72
     9     1      9
     3     4    192
```

TABLE 3 QUESTION 3

```
function [y0] = spring(t)
%This function calculates the length of a spring
%My student number is The last digit is 3.
```

```

x = [ ]; %Set the x value to be blank at the beginning
y = [ ]; %Set the y value to be blank at the beginning
for t = -2:0.001:30 %Set the value of t to span from -2 to 30
%The space was set to be 0.001 for the smoothness of the curve in the
graph
    if t<0
        y0 =-4.5; %According to the introduction,y(t)=wy0
        x=[x t]; %Set the x value equal to time
        y=[y y0]; %Set the y value equal to the distance as t<0
    elseif 0<=t && t<10
        y0 = -4.5*cos(6.5.*t);
        %According to the introduction, y(t)=-y0*cos(wt)
        x=[x t]; %Set the x value equal to time
        y=[y y0]; %Set the y value equal to the distance as 0<=t<=10
    else t >= 10
        y0 = (-4.5)*cos(6.5.*t)*exp(-0.1.*(t-10));
        %According to the introduction, y(t)=?y0*cos(w*t)exp(-k(t-10))
        x=[x t]; %Set the x value equal to time
        y=[y y0]; %Set the y value equal to the distance as t>10
    end
end
end
plot(x,y);
title(' The Displacement of the Mass as a Function of Time');
xlabel('Time (Second) ');
ylabel('Displacement (Centimetre)')

```

TABLE 4 QUESTION 4

```

function output=Automobile(Month,Distance,Fuel,MPG,Lper100km)
%This function calculates the value of MPG and L/100km
%My Student Number is 101 103 993
%Convert the data into the form of matrix
Month = [1;2;3;4;5;6];
Distance = [2445;2458;2115;2733;2084;2593];
Fuel = [210;234;172;220;206;219];
MPG = round(((Distance/1.61)./(Fuel/3.785)),1);
%Use round function to set the significant figure to be 3 with 1 decimal
Lper100km = round((Fuel./(Distance/100)),2);
%Use round function to set the significant figure to be 3 with 2 decimals
table (Month,Distance,Fuel,MPG,Lper100km)
%Construct a table
round((mean(MPG)),1) %'Round' function was used to set the significant figure to be 3
round((mean(Lper100km)),2)
%The average of MPG and L/100km with 3 significant figures
%With 1 and 2 decimals respectively

>> Automobile

ans =

    6×5 table

    Month      Distance      Fuel      MPG      Lper100km
    _____  _____  _____  _____  _____

```

1	2445	210	27.4	8.59
2	2458	234	24.7	9.52
3	2115	172	28.9	8.13
4	2733	220	29.2	8.05
5	2084	206	23.8	9.88
6	2593	219	27.8	8.45

ans =

27

ans =

8.7700

The average fuel efficiency is 27.0 MPG.

The average fuel consumption is 8.77 L/100 km.

TABLE 5 QUESTION 5

```

StudentNumber =;
%My student number is.
count = 0; %The number of count starts from 0
x=[ ]; %Set the x value to be blank at the beginning
y=[ ]; %Set the y value to be blank at the beginning
while(StudentNumber~=1) %While the value of StudentNumber does not equal to 1
    count = count+1; %The numbe of count will add 1 to itself after each calclation
    if(mod(StudentNumber,2)==0)
        %When StudentNumber is devided by 2 and the left over is zero, it is an even
        number
        StudentNumber = StudentNumber/2;
        x=[x count]; %Set the count of x in the form of coordinate
        %Logarithm in base 10
        y=[y log10(StudentNumber)];
        %Set the count of y in the form of coordinate, and take the logrithm in the form
of 10
    else
        StudentNumber = 1+StudentNumber*3;
        x=[x count]; %Set the count of x in the form of coordinate
        %Logarithm in base 10
        y=[y log10(StudentNumber)];
        %Set the count of y in the form of coordinate, and take the logrithm in the form
of 10
    end
end
%Reverse the series by flipping the array of x.
x=fliplr(x); %Set the number of count to be reverse to match the requiremnt of the
question

```

```
fprintf('count = %d',count); %Display the number of calations in the command window
plot(x,y); %Plot to the form of graph
title('Question 5'); %Set title
xlabel('The Number of Reverse Iterations'); %Set the label on x axis
ylabel('The Logarithm of Student Number in Base 10'); %Set the label on y axis
%The residual bar graph was plotted with the plotting function
```

```
>> StudentNumber
count = 368>>
```

Basic Fitting - 1

Select data: data1

Center and scale x data

Plot fits

Check to display fits on figure

- spline interpolant
- shape-preserving interp...
- linear
- quadratic
- cubic
- 4th degree polynomial
- 5th degree polynomial
- 6th degree polynomial
- 7th degree polynomial
- 8th degree polynomial
- 9th degree polynomial

Show equations

Significant digits: 3

Plot residuals

Bar plot

Separate figure

Show norm of residuals

Numerical results

Fit: quadratic

Coefficients and norm of residuals

$$y = p1*x^2 + p2*x + p3$$

Coefficients:

p1 = -7.2816e-05  
p2 = 0.053731  
p3 = 0.13187

Norm of residuals = 21.044

Save to workspace...

Help Close