CS2035b Data Analysis and Visualization - Lab 1

General lab instructions to help labs run smoothly

- Read through the lab instructions **before** coming to the lab.

- Do any required pre-lab preparation.

- Bring a **printed** copy of the lab instructions to the lab.

Overview and Preparation

This (and all subsequent) labs will be using MatLab as installed in the HSB15 and HSB16 general computing labs. You are required to attend this lab and photo ID may be required as proof of identity. You can use your UWO login/password to login to these machines. Lab submission is to be done via OWL (details in the lab). Remember, labs are worth 10% of the total grade for this course (there are 10 labs in total and you must do 8 to receive full marks). Doing your labs at home and submitting them via OWL is not acceptable, you must attend the lab and sign the attendance sheet.

Activate MatLab on one of the HSB14/HSB16 machines. Set your directory to `C:\users\UWOusername` (your home directory) using the **cd** command. You have to do this only once, type `userpath('C:\users\UWOusername')` in your command window. Future invocations of MatLab will then start in this directory.

Upon completion of this lab, you will have done the following in the MatLab environment:

- Created a file, **lab01_output.txt**, using the MatLab **diary** command:

  ```
  diary lab01_output.txt
  ```

  which starts the diary file. All subsequent commands and their output will be saved to this file. Type `diary off` to turn the diary off.

- Run the commands required to complete lab 1, saving the commands and their output to the **lab01_output.txt** file.

- Use the MatLab editor (double click on **lab01_output.txt** in the current folder window on the left. Remove any erroneous lines in this file.

- Submit this diary file via the course OWL page for lab 1 credit.

Exercise 1: Getting Started with MatLab

Login to free machine in HSB14/HSB16 using your UWO username and password (that you use to read your email). Start up MatLab. If this is your first time using MatLab in this lab you should see an empty workspace, an empty command history and an empty folder file. Otherwise you will see your previous contents.

Create a MatLab diary file **lab01_output.txt** and use **fprintf** commands to print a first line "Exercise 1: Getting Started with MatLab", then on a second line, giving your name and student number (for example, the professor might print "John Barron 123456789"), then a blank line, and finally, in the third line, print a character string containing: "Hello, cruel world!!!".

Exercise 2: Doing Arithmetic in MatLab

Do the following simple MatLab calculations:

```
fprintf('\nExercise 2: Doing Arithmetic in MatLab\n');
2+3*7
(2+3)*7
2+(3*7)
t=5;
t=t+1
5*t
1/(2+3^2)+4/5*6/7
1/2+3^2+4/5*6/7
x=22/7;
format short
x
format long
```

```
x
format
x

a=5; x=2; y=8;
y = exp(-a)*sin(x)+10*sqrt(y)
log(142)
log10(142)
sin(pi/4)
exp(10)
10*sin(19*pi/200)*exp(10^(-0.1))
sin(magic(3))
```

Exercise 3: Simple Array Calculations

Do the following exercises:

```
fprintf('\nExercise 3: Simple Array Calculations\n');
v = [1 4 7 10 13]
w = [1;4;7;10;13]
q = v'
v(1:3)
v(1,end)
v(:)


A = [1 2 3; 4 5 6; 7 8 9]
A(2,1)
A(3,3)=0
A(2,:)
A(:,2:3)
A(:,2)=[]
disp(sprintf('\nA\n'))
```

```
A
A(1:2,1:2)
A(end:-1:1,end)

x = 0:0.1:5
theta = linspace(0,2*pi,numel(x))
sin(theta)

eye(3)
eye(3,3)
```

Submitting lab01_output.txt

Submit **lab01_output.txt** online via OWL according to your TA instructions. Successful submission of this file will constitute the end of your Lab 1 work. Also, since it will give you practice in online submission of a file, there will be no allowances made for not being able to do so for assignments 1 to 4 or labs 2 to 11. Your TA can help you with this lab submission via OWL.

Note that OWL lists each lab as worth 1 point, but actually they are worth 1.25 points each. OWL does not allow 2 digits to the right of the decimal point but this grade weight will be correctly used when the final grades are computed.

Lastly, don't forget to sign the lab attendance sheet that you TA has. No signature, no lab credit!!!