CS2035b Data Analysis and Visualization - Lab 2

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 Health Sciences 16 general computing lab. You must attend this lab in HSB14 or HSB16. You can use your UWO login/password to login to these machines. Lab submission is to be done via Owl. Remember, labs are worth 10% of the total grade for this course (there are 11 labs in total, you must do 8 to receive full marks).

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

- Created a diary file, output02.txt, containing MatLab code for this lab plus its output.
- Submit lab02.m, output02.txt and all generated jpg files via the course Owl page.

Exercise 1: Doing Arithmetic in MatLab

Do the following simple MatLab calculations:

```
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
a=7; b=cos(a), c=cosh(a)
a
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))

% Complex number and arithmetic
z = 2.3 - 5.2*i   % define a complex number
ceil(z)
floor(z)
round(z)
```

```
fix(z)
real(z)
imag(z)
abs(z)

sqrt(2345.676)
sqrt(-2345.676)

% Rational numbers
% rat takes a floating-point number as input and returns
% n and d are integer numbers such that x \approx n/d.
x=0.353535;
[n,d] = rat(x)
% verify the result
n/d

[n,d]=rat(0.3333333333333)
[n,d]=rat(0.3333)
```

Exercise 2: Simple 2D Plotting in MatLab

The following 3 MatLab segments plot 2D graphs.

```
% A plot of the square root function
x = [0:0.1:4];
plot(x,sqrt(x));
title('square root');
xlabel('x');
ylabel('y');
print square_root.jpg -djpeg

% A plot of the exponential function
x = [-2:0.1:5];
```

```
plot(x,exp(x));
title('exponential function');
xlabel('x');
ylabel('y');
print exp.jpg -djpeg

% A plot of the natural logarithm function
x = [0.1:0.1:10];
plot(x,log(x));
title('natural logarithm');
xlabel('x');
ylabel('y');
print natural.jpg -djpeg
```

Generate these graphs. Include you code in lab02.m.

Exercise 3: Submit your lab results

Submit output02.txt, lab02.m and your three jpg files via OWL by Sunday at 11:55pm at the latest. Remember you must attend the lab and sign the attendance sheet, in addition to submitting the lab via OWL to get full marks of the lab,