1 Try out the following commands

i) *%tab*
```
fprintf('This is text');            %_____
fprintf('This is a real \t tab');   %_____
fprintf('This is \\t how you display backslash t as a char');
                                    %_____
```

ii) *%new-line -- 1*
```
fprintf('I am line 1…');
fprintf('I am line 2…'); %_____
```

iii) *%new-line -- 2*
```
fprintf('I am line 1…\n');      %   How did the output differ from(ii)
fprintf('I am line 2…');        %_____
```

iv) *%apostrophe*
```
fprintf('MATLAB's escape sequence');
fprintf('MATLAB''s escape sequence');
```

```
v)   A = [1, 2, 3, 4, 5];      %These are two arrays A and B
     B = [6, 7, 8, 9, 10];
     a. A^2              %_____
     b. A.^2             %_____
     c. A.*2             %_____
     d. A.+2             %_____
     e. B(2:3)           %_____
     f. B(3)             %_____
     g. A.+B             %_____
     h. length(A)        %_____
```

2 Call me ANONYMOUS

Download *lab4.zip* from the location, *www.cs1109.info/labs/lab4/lab4.zip*. Open the file *anonymousFunctions.m*. It has 3 anonymous functions, **parabola**, **sinAlphaX** and **plane**. There are two new functions you will see in the commands below –

- **ezplot** – Easy-to-use function plotter. This is used to plot graphs and functions
- **ezsurf** - Easy-to-use 3-D colored surface plotter. This is used to plot surfaces and graphs

Go through the script and see how Go to the MATLAB command window and type in the following commands (Verify that your current working directory has the file *anonymousFunctions.m*)-

```
a) anonymousFunctions      %Doing this will set the desired variables in the workspace
b) parabola(2,3)
   ezplot(parabola)        %This function is used to draw a graph
c) plane(4,2)
   ezsurf(plane)           %This function is used to draw surfaces
d) sinAlphaX(10)
   ezplot(sinAlphaX)
```

Play with the values of a, b, c, alpha, m or n and see how the plots change.

3   Series

Open the file *sumSeries.m*. Write a function which calculates the following series value uptil the nth term–

$$1 + 1 * \left(\frac{1}{2}\right) + 1 * \left(\frac{1}{2}\right) * \left(\frac{1}{3}\right) + 1 * \left(\frac{1}{2}\right) * \left(\frac{1}{3}\right) * \left(\frac{1}{4}\right) + \ldots$$

Where, nth term is given by

$$x_n = 1 * \frac{1}{2} * \frac{1}{3} * \frac{1}{4} \ldots\ldots * \frac{1}{n}$$

This function takes in one argument **'n'**. Use two for loops, the outer to update the sum and the inner to calculate each term.

4   Fix the bug

Open the file *fixME.m*. Study the script. There is a bug in the code. Correct the mistake and write the output.

5   Challange

Open the file *taylor.m*. There are three functions viz. **factorial**, **powerN** and **taylor**. Complete the factorial function as shown in the class. The function **taylor** calculates the taylor series expansion of **e^x**, the formula for which is given by --

$$1 + \frac{x^1}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \cdots = 1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + \cdots = \sum_{n=0}^{\infty} \frac{x^n}{n!}.$$

Write a for loop (look for TODO in the file) which evaluates the series till the 10th term i.e. **(x^{10} / 10!)**