OBJECTIVES

1. Learn to prepare simple MATLAB functions.
2. Use loops and fprintf function

GENERAL INFORMATION on fprintf

Displaying calculated results properly is one of the important parts of user interface in programming. The matlab function fprintf can be very useful for presenting the results to users. fprintf is inherited from C-programming language and in order to use it in full capacity programmers need to gain experience on its formatting capabilities.

fprintf accepts variable number of arguments, first one being a character string determining the output format. The rest of the arguments are the data to be printed out in the format defined by the format string.

For example; (assuming that v=12.94 and x=65)

```
fprintf(’Var=%7.1f and x is %d\n’,v,x);
```

displays “Var= 12.9 and x is 65”. %f and %d causes v and x to be printed in floating point and decimal integer formats respectively. %7.1f causes a total of 7 characters printed (including decimal point) 1 of which is after the decimal point. Since 12.9 is only 4 characters long, there are 3 spaces before it. The remaining characters in the formatting string are printed as they are.

Basic formatting characters are summarized below.

- %d : decimal (integer)  %ld : decimal (long)
- %f : float  %lf : double
- %n.mf (n, m are integers): m digits after radix, total n digits (if possible)
- %s : strings  %c : single character

Escape Characters are   \n : next line   \t : tab

EXPERIMENT

We need a trigonometric values table for sin and cos functions. The function for that should be called with three arguments and the table should look like as shown below. Function should return the number of lines in the table.

```
>> O=TrigTable(0,pi,0.2);
   angle     sine     cosine
     0.000   0.000   1.000
    11.459   0.199   0.980
    22.918   0.389   0.921
    34.377   0.565   0.825
    45.837   0.717   0.697
    57.296   0.841   0.540
    ...
```

1. Create the function TrigTable with 3 arguments. Arguments are starting angle, ending angle and the step (all in radians). The output table should have 3 columns: angle (in degrees), sine and cosine values, with the column headers printed out accordingly (see example above). Use %n.mf, \t and \n format characters.
2. Change the function to display the tangent values on an additional column. Handle special cases.

QUESTIONS

1. How would you change the function in order to handle both radians and degrees as input arguments? Explain.