A Small Numerical Library Design Document

Purpose

The purpose of the assignment is to implement the functions like sin,cos,tan,exponential and log using taylor series.

Design

```
Start
  while option is there in command line argument
        Parse the option
        If option ==’a’
                Calculate Sin
                Calculate Cos
                Calculate Tan
                Calculate Exponential
                Calculate Log
        Else If option ==’s’
                Calculate Sin
        Else If option ==’c’
                Calculate Cos
        Else If option ==’t’
                Calculate Tan
        Else If option ==’e’
                Calculate Exponential
        Else If option ==’l’
                Calculate Log

Stop

Calculate sin
        result:x
        for i<-1 to (max terms/2-1)
        value:Calculate power of x to the (i*2)+1
        value:value/factorials[ i*2 ]
         if (i & 0x01)
                 result -= value;
         else
```

```
        result += value;
          i+=.1
return result


Calculate cos
          result:1
          for i<-1 to (max terms/2-1)
          value:Calculate power of x to the (i*2)
          value:value/factorials[ i*2 -1]
           if (i & 0x01)
                    result -= value;
          else
                result += value;
          i+=.1

return result

Calculate tan
          return SIn(x)/Cos(x)

Calculate Exponential
          sum:1.0
          for i<maxterms-1;
                    sum=1+x*sum/i
          return sum
Calculate Log
          count :1, totalValue :0, z, powe : 1, y;
           z : (x + 1) / (x - 1)
          step = ((x - 1) * (x - 1)) / ((x + 1) * (x + 1));
          while  count less than equal to maxterms)
                       z *= step;
                    y = (1 / powe)*z;
                    totalValue = totalValue + y;
                    powe = powe + 2;
                    count++;
      return 2*totalValue;
```