Project Documentation Computer architecture

First the User has to make three inputs:

1.Interval start (x min)  
2.Interval end (x max)  
3.desired numbers of partitions ( > 1 , )

All values can be derived from this formula:

Stepsize s = xmax – xmin / n   
xmin, xmin+s, xmin+2\*s, …., xmin+n\*s = xmax

The program iterates for each value of the interval with it’s according partitions (from low to high) and displays following outputs:

|  |  |  |
| --- | --- | --- |
| Calculate sin(x) | Calculate cos(x) | Calculate tan(x) (ERROR: x=n\*PI/2) |

Sin Function:

First we have to modify x by adding/subtracting PI to/from it, to bring it in the interval from -PI/2 to PI/2 (it modifies the sign accordingly)

Then we set the number of Taylor approximations and continue with the calculation of the Taylor series.  
We define two variables for the denominator and for the numerator, with them we can calculate the first term (which is x).  
If we have only one approximation then we can return the first term (x), else we define new variables for our result and last term (both are our first term at first).  
Now we can iterate until we’ve reached the approximation count. In each step we define and determine a next term which is the last term with its exponent increased by two and divided with the according factorial.  
then we add the next term to our result and copy the value from next term to last term.  
If we’ve finally reached the approximation count then we can return our result.

The cos is calculated by adding pi/2 to x and calculating the sin afterwards.

Tan is calculated by dividing sin and cos. However, firstly it checks whether the modified |x| = pi/2 🡪 x = n\*pi + pi/2 first, and throws an error if this is the case.