AERE 361: Lab 6

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1 Exercise 2

Algorithm and Design

- My program will use if loops to ask for user input and determine if it is credible

Complexity

- My algorithm uses as few **if** loops as I thought possible, so the least efficient part is the **while** loop that does the actual math. With higher input the computer will take more time since it must compute a power and factorial, both non-linear functions.

Algorithm 1 Algorithm for finding the factorial

```
                                                    ▷ Required variables:
double error input
double error = 1
double x
double intial answer
double answer
int iteration
                                    ▷ creating variables given valid arguements
if x greater than 1 then
    x = atof(i)
    error input = atof(j)
end if
                                                ▷ Begins loop to ask for user input
else
printf user variable input statement
scanf for lf
                                                ▷ Checks that x is positive integer
if x less than or eqaul 0 then
    printf error message needed x as positive
    end program
end if

printf ask for relative error
scanf for lf
                                    ▷ Checks that error input is within bounds
if error input not between 0 and 1 then
    printf error for invalid number
    end program
end if

end else
                                                ▷ This is the Mclaurin series magic
while error less than error input do
    iteration = iteration + 1
    intial answer = answer
    answer = answer + math formula
    error = fabs function * ( intial answer - answer)
end while

printf final output
```