Extra Exercises Handout Two

October 5, 2011

Question One

Write a fortran code to compute the sum of the squares of the first n integers.Use a single '`DO`' loop to do this along with a '`REAL`' data type to hold the summation. Note that you can read in a value from the keyboard, during the execution of a fortran program, with the '`READ`' command as follows. Given you have declared '`num1`' to be and '`INTEGER`' type in the specification part of your code. You can read an integer value into '`num1`' using

'`READ*,num1`'

Question Two

The Taylor Polynomial $P_N(x)$ for $f(x) = \ln(x)$ expanded about $x_0 = 1$ is,

$$P_N(x) = \sum_{i=1}^{i=N} \frac{(-1)^{i+1}}{i} (x-1)^i$$

write a code that prints out the value of $P_N(x)$ for $N \in \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$. Use a pair of nested '`DO`' loops for this purpose.

In your code also print out the error in the approximation. Note to do this you can use the Fortran function '`ALOG(num)`' which returns the natural log of the value '`num`'. For example if you stored the result of the approximation P_N(`num`) in the '`REAL`' variable '`tot`' then

```
PRINT*,ALOG(num)-tot
```

would give you a measure of the error.