Assignment 9
Due: 2:00PM 11/8/19

Convert your Simpson's Rule code (from Assignment 6) to use double precision for all real variables and constants. You should also modify your code to use a subroutine to supply the limits of integration and a user defined function subprogram to evaluate the integrand as a function of x at each point within the subinterval as needed to evaluate Simpson's Rule (note: you should invoke the function subprogram three times with three different arguments. The code should compute the x abcissas directly (see examples in the Lecture 22 notes) as opposed to incrementing the location of the abcissas.

Do not create three different function subprograms!) For simplicity package all of your code in one file. Finally repeat the convergence study you did and note, in comments in the header block, how the converged value you find for the integral compares to the value you found using single precision reals in Assignment 6.

Make sure that you code compiles (programs receive a zero if they are not able to be compiled on the Math SINC site machines) and make sure to test it by running it and observing that you get the correct answer! Submit only the source code file, i.e. the .f08 file containing the Fortran code, by uploading it into blackboard using the "attachments" button under the assignment. **Do not submit the executable file.**
If you submit the executable file you will receive zero credit

If you have any problems see the TAs or the instructor for help. Do not ask other students to help you debug your code. Submissions via email will not be accepted. **DO NOT WAIT UNTIL THE LAST MINUTE TO SUBMIT THE ASSIGNMENT! LATE ASSIGNMENTS WILL NOT BE ACCEPTED.**

Note:

1. **All Fortran programs must contain the implicit none statement or they will receive an automatic grade of zero.** There are no exceptions to this policy.

2. All programs should have a block of comment statements at the beginning of the code containing your name, **section number** (consult SOLAR if you are in doubt as to which section you are registered for), and a description of what the code does. Consult the lecture notes for examples.

3. Your file should be named in the form of <*yourlastname*>_<*yourIDNumber*>_<*hw#*>.f08 (Do not put the # sign in the file name!)

4. All programs must compile using the gfortran compiler on the Mathlab machines. **Programs that do not compile will receive an automatic grade of zero.** There are no exceptions to this policy

5. Programs must be uploaded into the blackboard assignment page. Programs may not be submitted via email or hardcopy. Programs that are not uploaded into the blackboard assignment page will not be graded.