Note: All work must be done independently. Any suspicion of plagiarism in your code will result in a referral to the SBU Academic Judiciary

Assignment 2
Due: 5:00PM 9/13/19

The relativistic kinetic energy of a particle is given by $K = (\gamma - 1)\, mc^2$

where $\gamma = \left(1 - \frac{v^2}{c^2}\right)^{-1/2}$

and m is the particle mass, v is the particle speed, and c is the speed of light. Write a Fortran program that calculates the energy of a particle in MKS units. The program should prompt the user prompts the user to enter the particle mass and speed in and output the particle kinetic energy to the terminal screen. In the header block include a statement (in the comments) indicating what kinetic energy you found for a particle mass of 1 kilogram and a speed of 10,000,000 meters per second. Also state if you are certain that your program is giving a correct result for the particle kinetic energy.

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

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.