PHYS H304 Homework 0

Petra Mengistu*
(Dated: January 26, 2023)

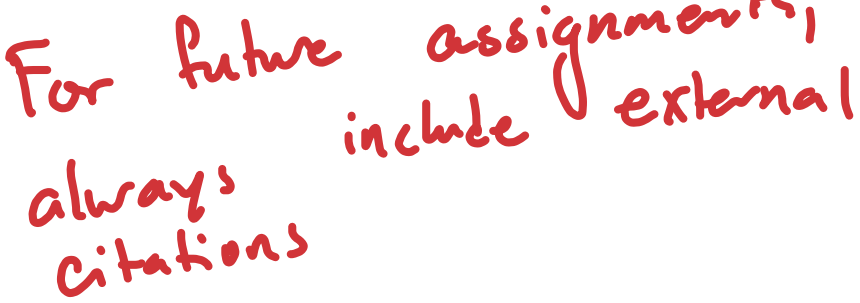
This is a trial of the LateX tutorial for the first problem set in PHYS H304.

1. INTRODUCTION

My favorite equation is Eq. 1, which is one of the fundamental equations in quantum mechanics.

$$E = m \cdot c^2 \tag{1}$$

Eq. 1 was coined by Albert Einstein, and is commonly thought to have laid the basis for the creation of the atomic bomb. It relates energy to the mass of a particle, given by the 'm', proportional by a factor of the speed of light squared. Hence, this provides an estimate for the "rest mass" energy of any particle with a non-negligible mass. This equation is analogous to that of kinetic energy, as it corresponds to mass multiplied by the square of the speed of motion. However, it signifies the importance of considering particles traveling at relativistic speeds.



Computational Physics/Astrophysics, Winter 2023:

Grading Rubrics [1]

Haverford College, Prof. Daniel Grin

7/7

For coding assignments, roughly 25 points will be available per problem.

1. Does the program complete without crashing in a reasonable time frame? If yes, up to +3 points.

2. Does the program use the exact program files given (if given), and produce an answer in the specified format? If yes, +1 points

3. Does the code follow the problem specifications (i.e numerical method; output requested etc.) Up to +2 points

4. Is the answer correct? Up to+4points

5. Is the code readable? Up to+2points

. 5.1. Are variables named reasonably?

. 5.2. Are the user-functions and imports used?

. 5.3. Are units explained (if necessary)?

. 5.4. Are algorithms found on the internet/book/etc. properly attributed?

[1] Inspired by rubric of D. Narayanan, U. Florida, and C. Cooksey, U. Hawaii

6. Is the code well documented? +3points

. 6.1. Is the code author named?

. 6.2. Are the functions described and ambiguous variables defined?

. 6.3. Is the code functionality (i.e. can I run it easily enough?) documented?

7. LaTeX writeup (up to 10 points)
   - Are key figures and numbers from the problem given? (3 points)
   - Is a brief explanation of physical context given? (2 points) 2/2
   - If relevant, are helpful analytic scalings or known solutions given? (1 point) 1/1
   - Are 3-4 key equations listed (preferably the ones solved in the programming assignment) and algorithms named? (2 points) 2/2
   - Are collaborators clearly acknowledged? (1 point) 1/1
   - Are any outside references appropriately cited? (1 point) 1/1

Note, even if (1), (2), (3), or (4) are not correct, one can still obtain many points via (5), (6), and (7).