

Technical Homework 1

PHY410: Do problems 1 and 2
PHY 505: Do all three problems.

Accept the assignment from github classroom: <https://classroom.github.com/a/cH7PvUY7>.
You will then get a link to your own github area.

You should submit your code through github classroom. Submit your writeup, and a link to your github classroom area where your code is, on UBLearn. Be sure to have a github account and link it to your assignment.

To submit your code:

```
git clone <insert the link to your code here>
mkdir Assignment1
cd Assignment1
<do your coding>
git add Problem3.cpp
git commit -m"<Add a descriptive message here>"
git push origin main
```

Note: do not directly cut and paste the text in angled brackets above, you must insert your actual filenames and other relevant information.

My example is (and yours will be different):

```
git clone https://github.com/ubsuny/technical-assignment-1-rappoccio
cd technical-assignment-1-rappoccio
mkdir Assignment1
cd Assignment1
git add Problem3.cpp
git commit -m"I hope I passed"
git push origin main
```

You must name your files after the problem number like "Problem3.cpp".

Problem 1 (25 points):

What are the two's complement representations for the following (decimal) numbers? Use 12 bits.

- 10
- 436
- 1024
- -13
- -1023
- -1024

Problem 2:

Suppose I need to compute the series

$$f_n = f_{n-1}^2$$

. If the value $f_0 = 2$, what is the maximum n that can be stored in the following C++ data types, assuming that an int is 4 bytes, a long int is 8 bytes, and each byte stores 4 bits?

- int
- long int
- unsigned long int

Problem 3 (PHY505 only):

Starting from one of the C++ programs in "ReviewCpp", write a C++ program "Problem3.cpp" to demonstrate Problem 2 on your computer. That is, implement the series using int, long int, and unsigned long int variables, and print out the value of the variable at each step of the series. Did you see what you expect? Why or why not? Your code must pass this unit test:

```
g++ -std=c++11 Assignment1/Problem3.cpp -o Problem3
./Problem3
```