Technical Homework 2

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

Accept the assignment from github classroom: https://classroom.github.com/a/q58ZJdtM. 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 UBLearns.
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 Assignment2
cd Assignment2
<do your coding>
git add <insert filename here>
git commit -m"<Add a descriptive message here>"
git push origin master
```

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-2-rappoccio
cd technical-assignment-2-rappoccio
mkdir Assignment2
cd Assignment2
git add Problem1.cpp Problem2.cpp Problem3.cpp
git commit -m"I hope I passed"
git push origin master
```

Please name your files after the problem number like "Problem1.cpp", "Problem2.cpp", etc. If you are using the same code for multiple problems that's fine, just pick one name.

Problem 1:

Write a C++ program that inputs the x and y values for two separate points in 2-d space from the user, and computes the midpoint, slope, and y-intercept, and prints them all to the screen. The program should also then print the equation for the line between them like "y = 0.4x + 0.1", and the equation for the line perpendicular to it that passes through the first point. This should be input as "x1 y1 x2 y2". Your code should correctly handle these inputs:

- *(-1,-1), (1,1)*
- *(1,-1),(1,1)*
- *(1,1),(1,-1)*
- *(-1,-1),(1,2)*
- *(1,1),(1,1)*
- *(1,-1), (1,1.00005)*

Problem 2:

Given the following declarations:
int i1 = 2, i2 = 5, i3 = -3;
double d1 = 2.0, d2 = 5.0, d3 = -0.5;
Evaluate each of the following C++ expressions..
*i1 + (i2 * i3)*
*i1 * (i2 + i3)*
i1 / (i2 + i3)
i1 / i2 + i3
3+4+5/3
(3 + 4 + 5) / 3
*d1 + (d2 * d3)*
*d1 + d2 * d3*
d1 / d2 - d3
d1 / (d2 - d3)
d1 + d2 + d3 / 3
(d1 + d2 + d3) / 3
d1 + d2 + (d3 / 3)
*3 * (d1 + d2) * (d1 - d3)*

Problem 3 (PHY505 only):

Assume you are programming an automatic food dispensing machine. Your company offers one of three entrees for lunch:

e1. Veggie burger: $7

e2. Falafel wrap: $6

e3. Salami sandwich: $9

They also offer one of three sides :

s1. French fries. $2

s2. Hummus with pita chips. $3

s3. Celery and carrots $2

There are eight choices for beverages:

b1. Tap Water. Free of charge.

b2. Sparkling water. $2

b3. Domestic beer. $4.

b4. Imported beer. $6.

b5. Red wine. $7.

b6. White wine. $7.

b7. Coffee. $1.

b8. Tea. $1.

The food dispensing machine should input the items desired from the command line (for example, "e1 s2 b5" would be a Veggie burger with Hummus and Pita Chips, with red wine), and compute the price.

However, certain combinations are on special, so the price is discounted. A veggie burger and fries, plus any non-alcoholic drink (b1,b2,b7,b8) is $8. A Falafel wrap plus hummus with pita chips, and any hot beverage (Coffee or Tea) is $7. A salami sandwich with any side and any alcoholic beverage is $13.

Write a program that will give the correct price for any combination, including the specials. It should recognize the specials as they are input to the menu, in any order (so, "b8 s2 e2" should be priced as a special).
Your program needs to handle these cases:

• e1 b5 s2 ($17)

• b7 e1 s1 ($8)

• b8 s2 e2 ($7)

• e3 b3 s3 ($13)