Start a new program file. Call it yourname_lab3.py, replacing your name, with your name.

Add comments to the top of your code that tell me who you are, what this code is, and who your lab partner was.

Solve the following problems. IT WILL HELP to solve them on paper before trying to write code.

You can solve them with different IF structures, but some are much easier that others. Figure out the problem before starting to code.

(1) Starting with the code I give you on Nexus called shareTrade.py, edit this code so that if the profit is greater than zero, the code prints "Joe made a profit of..." and print the dollar amount. If the profit is less than zero, the program should print "Joe suffered a loss of..." and print the dollar amount. Experiment with your code by changing the value of variables, to make sure that the correct print statement appears in the correct situation.

(2) In class, we talked about multi-way decisions, using elif. I've attached code from yesterday, showing how we implement decisions in a nested format (using indentation) and using ELIFS. The general format for if-elif-else chains is as follows:

if <boolean-expression>:

    code block

elif <other-boolean-expression>:

    code block

else:

    code block

There can be as many elif expressions as you want.

Change the code from (1) above, to use an if-elif-else structure, to include a statement to be printed if the profit is exactly zero. Something like "Wow. Joe ended up all square".

For the following, I want you to figure out what kind of decision structure you need. Is it a single way, a two-way or a multiway decision.

(3) Write a program that classifies students according to how many courses they have completed. A student with fewer than 9 courses is considered a *First-year*, while a student with fewer than 17 courses is classified as a *Sophomore*, fewer than 25 courses is considered a *Junior* and any student who has completed more courses is classified as a *Senior*. The program will prompt the user for the number of courses completed and will then print out the corresponding classification.

(4) The speeding fine in Pennsylvania is dependent on the number of miles per hour over the specified limit. The fine is $50 plus $5 for each mph over the limit plus a penalty of $300 for any speed over 80mph. Write a program that asks for a speed limit and asks for a clocked speed, and either (a) prints a message indicating that the speed was legal or (b) prints the amount of the fine if the speed is illegal. What bits really need to be part of an IF statement here?

(5) Write a program that asks for three bits of information independently: a month, a day, and a year and prints whether or not the date is valid. We will assume ALL months have 31 days. We assume there are 12 months, numbered 1 through 12. We assume all years from 0 up to and including the year 9999 are valid. No negative numbers are valid. What structure might work here? If the date is valid, print DATE VALID.

For example, 5,24,1962 is valid but 6, 32,1000 is invalid. Have your code print valid or invalid, and WHY. In the case of multiple invalid options, print ONLY the first. e.g.

Enter Month: 13

Enter Day: 33

Enter Year: 10002

should ONLY print:

INVALID: Month too high

Enter Month: 12

Enter Day: 33

Enter Year: 10002

should ONLY print:

INVALID: Day too high

(6) Assume that hot dogs come in packages of 10, and hot dog buns come in packages of 8. Write a program that calculates the number of packages of hot dogs and the number of packages of hot dog buns I need for a cook out, with the minimum amount of leftovers. The program should ask the user for the number of people at the party, and the number of complete hot dogs each person will be given. The program should display:

1. The minimum number of packages of hot dogs required
2. The minimum number of packages of hot dog buns required
3. The number of hot dogs left over
4. The number of hot dog buns left over

HINT: There are no fractions of hot dogs, or buns. For example, if there are 11 people with 1 hot dog each, I will need 2 packets of hotdogs, with 9 hotdogs left over, and 2 packets of hot dog buns, with 5 buns left over.

Giving me an answer with a fraction component (2.33 hotdogs) will be considered INCORRECT.

HINT: Integer math will help you here. Is there a mechanism that you can use, that tells you HOW MANY things are left over, when you've performed division? Did we talk about it in the first week? I think we did. HOW do you do integer math in python? How does that even help here?

SOLVE the problem for yourself before you even TRY to code it.

HINT: Think about the structure of this problem. Where's the decisions to be made? Test your code with different examples, that you've also work out on paper.

Turn in all python code to Nexus by 10pm.