Lab: Variables, Data Types, Input, Output, Comments

For all of these programs, put a comment at the top of your code explaining what the purpose of the program is.

1. Write a program, saved as a file called `taxes.py`, that asks the user for
    their hourly wage (a float)
    how many hours they work per day (a float)
    how many days they work per week (an int)
    Your program should print their gross pay (how much they make before taxes are deducted), as well as their net pay (how much they make after taxes are deducted; assume 15% is taken out for taxes). Use appropriate strings in your print statements so the user knows which number is which.

2. Write a program, saved as a file called `address.py`, that lets the user enter their first name, last name, street, city, state, and zip code, all as *separate* strings [6 in all] (why does zip code need to be a string?). Your program should print out an address label formatted as follows:

    ```
    Last, First
    Street
    City, State Zip
    ```

    Example:

    ```
    Washington, George
    1600 Pennsylvania Ave
    Washington, DC 20500
    ```

3. Write a program, saved as a file called `quadratic.py`, that lets the user input integers a, b, and c, and prints out the two solutions to the equation $ax^2 + bx + c = 0$.

    Hint: Put the following statement at the top of your program (the first line):

    `import math`

    Once you do this, you will be able to use the function `math.sqrt(x)` in your code, which accepts a number x and returns the square root of x. You can use this in your math calculations.

4. You win a small lottery and suddenly have $50,000 to invest. You decide to put it in the stock market, which historically averages about a 7% annual return (in other words, your money will increase by 7% each year). Write a program which allows the user to enter an amount of money they hope to earn, and your program should print the number of years it will take to earn that amount, compounding 7% annually.

    The formula for calculating the amount of money you'll have after Y years, if you start with P dollars, with an interest rate of r, with compound interest is:

    $$Value = P[(1 + r)^Y]$$

    Hint: Use `import math` again, along with the function `math.log(x)`. This calculates the natural logarithm of x.

    Assuming you need one million dollars to retire, how many years will it take you? What if you need two million? What if the initial amount is increased to $60,000? (Change your program to let the user input an amount). What if the stock market only averages 6%?