

Part A: Building upon an Existing Solution

For this portion of the lab, you will reuse the program you wrote in Lab 2. Redesign the solution so that you perform some conditional tests. For this part:

1. You will validate input to ensure that the user enters inputs within a certain range or larger than a certain minimum value. You will validate the program inputs as follows:
(LO 1, 2, 3)
 - a. The user cannot enter a negative number for:
 - i. miles (in miles to kilometers conversion)
 - ii. gallons (in gallons to liters conversion)
 - iii. pounds (in pounds to kilograms conversion)
 - iv. inches (in inches to centimeters conversion)
 - b. The user cannot enter a value above 1000 degrees for Fahrenheit (in Fahrenheit to Celsius conversion) (LO 1)
2. For each conversion, if the user enters an invalid value, the program will issue an error message. Otherwise, the program will do the conversion and print the result. In either case, the program should continue with the next conversion if any. **Important note:** If your program is working correctly, it should perform all conversions except for those where the input is invalid..
3. Save the program as `firstname_lastname_Lab3a.py` where you will replace `firstname` and `lastname` with your actual first and last name.
4. Test all conditions prior to submitting. To properly test a condition, you must try it with a value that results in a true condition and again with a value that results in a false condition. In other words, you must run your program at least twice for each condition and be sure that your inputs test both the True path and the False path.

Part B: Write Something New!

Write a complete and syntactically correct Python program to solve the following problem:

Terminology:

Gross salary – your salary amount before any deductions

Net salary – your salary amount after all deductions have been subtracted

Deductions – typical deductions may include income tax, social security tax, medical plan and retirement. For this assignment, deductions will be a percentage of the gross salary (a rate). For example, the retirement deduction amount will be the retirement rate times the gross salary.

You are the payroll manager for SoftwarePirates Inc. You have been charged with writing a program that calculates the monthly net paycheck for employees. Employees at SoftwarePirates get paid a monthly gross salary that is equal to the number of hours worked times the employee's hourly pay rate.

Each employee has the following deductions: tax, social security, medical, and retirement. The following table lists the deduction rates for different salary ranges:

Monthly Salary	Tax Rate	Social Security Rate	Medical Rate	Retirement Rate
< \$4,000	12%	4%	1%	6%
>= \$4,000 & < \$8,000	20%	7%	3%	6%
>= \$8,000 & < \$16,000	30%	9%	5%	6%
>= \$16,000	38%	11%	7%	6%

Input to the program will be an employee name, hours worked, and hourly pay rate. All input to the program will be interactive from the keyboard. Your program will only handle one employee. In order to input a second employee, the payroll manager must run the program again. **Do NOT use a loop in your program.**

The following additional conditions apply:

1. A user cannot enter hours worked less than 10
2. A user cannot enter an hourly pay rate less than \$9

If the user enters an invalid value, the program will issue an appropriate error message and end.

The output of the program will include the name of the employee, their gross salary, the amount of each deduction, and a net salary amount (LO 1, 2, 3).

Please save your file as `firstname_lastname_Lab3b.py` where you will replace `firstname` and `lastname` with your actual first name and last name. Remember to use the extension `.py`.

Run and test your program for all conditions. You need to run your program at least once for an employee in each salary range and verify that the deductions are correct. You may want to use a calculator to be sure the program calculations are correct. Once you are sure it works you will turn in the items listed in the next section.

Turn In

All labs will be submitted in Blackboard. Once you are done with the lab turn it in to the Lab 3 link. Please read the How To Submit instructions if you have any questions or contact the instructor.

For this lab you will turn into Blackboard:

1. The Python Code file you saved in part A
2. The Python code file you saved in part B