

Attach the assignment to your HW/Lab

Date: _____

You name _____

ENGR 102 Section **Lab 3a**

DUE DATE: see website

Team # (table) _____

ENGR 102 Sect # Lab 3a

Team #

50 points

Reading assignment:

Lecture Slides	L03
zyBook chapters 3	

Attention!!

Team submission: one submission per team. Submit on Canvas

For submission: pdf/word file and all py-files as asked in the assignment.

You will be allowed to resubmit and reupload HW as many times as you want to within the due date/time, only last submission will be graded. No late submissions.

For submission you may use this file as template: rename file including your name. Do not forget to put your name inside of this file as well. If it is a team work, include the team number and all team members.

To do in lab as a team

For this submission use Team Header, include all team members into the list of participants. Submit 1 assignment per team on Canvas

What to submit.

All py-files you produced and result – word/pdf file . Give your files meaningful names using previous labs examples, for example Lab3s_Act#_Name.py

Activity #1: [25] To do in lab – as a team

This activity is meant to help illustrate the process of asking a user for input and then reading their input, performing processing, and outputting a result. Many programs will follow that basic format.

As a team, write the following short programs. For each one, you are to write a program that converts from one type of unit to another. You should ask the user for input in one unit, convert it to the other, and output the answer in the converted units. Do so for each of the following conversions. Don't forget to put comments and units in the output

1. [5] Pounds (force) to Newtons
2. [5] Kilometers to miles
3. [5] Atmospheres to millimeters of mercury
4. [5] Watts to BTU per hour
5. [5] Liters per second to gallons per minute

This sort of activity (unit conversions) might seem very basic, but it's also critically important.

Conversion (a) above has a particularly costly history. Before your team leaves today, please search and read a little bit about the Mars Climate Orbiter, and read the two statements from NASA:

- <https://mars.nasa.gov/msp98/news/mco990930.html>
- <https://mars.nasa.gov/msp98/news/mco991110.html>

Notice from the statements both the root cause of the failure, and the contributing factors.

Activity #2: [25] To do in lab – as a team

This activity is meant to give your team a chance to write a larger program, together. **You are to write a program** that will read in four people's names [5], favorite place to visit [5] and favorite number [5], and will output them in a formatted list [10]. The final list should include people's names, favorite place to visit and favorite number in 3 formatted columns.

1. First, in a separate document (a text file, Word file, etc.) make a list of the variables that your team will use in this program. Your list should include:
 - a. The variable names
 - b. The type of each variable
 - c. A *very brief* description of what each variable is (you can write one description for multiple variables if it is clear what they all are)
2. Next, determine what instructions you want to give to the users. You should determine the text you want to tell the users. Be sure to be specific about the way you want them to enter information!
3. Third, determine how you want the output to be formatted. Consider how you want to align the various columns of the document. Note that all information should be lined up in clear columns as much as possible
4. Fourth, and only after completing the above, write your code. You can (and should) test your program to make sure it is working as expected. You should have to use comments inside of the program to include description of your variables.
5. Turn in the document, as well as team's program

Try experimenting by printing out strings containing the following escape characters, to see what they do:

\n, \t, \\, \b. If you cannot deduce what these do, feel free to look them up in an online Python guide. Make sure that *each member* of your team understands how each of those characters work. You may add any other additional information as you wish.

Note: the purpose in this assignment was, in addition to giving you practice for reading input and formatting output, to see that there can be different ways of constructing programs, and different ways of assuming input might be formatted. In most programming, there is not a single solution to a problem, and the programmer's choices for variables, information provided to the user, and output can vary, and still be correct.