

The purpose of this lab is to gain experience with command prompt I/O with python, and to become familiar with the use of the IDE and python interpreter. The completed lab must be submitted via Blackboard NLT (no later than) the beginning of the following week's lab session (i.e. one week after assignment). If you have questions, use the Blackboard discussion forums (and instructor/TA office hours) to obtain assistance.

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**Lab Requirements:**

- The source code for this lab must be submitted in a file named **lab2.py**
- The source code file must contain a **file header** formatted as follows:

```
# source_file_name.py
# Student Name: Josephine Student
# Assignment: Lab #2
# Submission Date: 09/09/9999
# Honor Code Statement: I received no assistance on this assignment that
#                       violates the guidelines as set forth by the instructor
#                       and the class syllabus.
# References: (This should be a list of web sites, texts, and any other resources
#            used as references)
# Comments: (This should be a note to the grader as to any problems or
#           uncompleted aspects of the assignment)
```

- The source code file should use **self-documenting code** and additional comments (as required) to improve code readability.
  - The solution for this lab must take inputs from the command prompt, and return outputs to the command prompt.
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**Grading Rubric:** This assignment will be graded as follows (see rubric for more details):

- File header (0-2 points)
- Requisite conversion formulas (0-3 points)
- Self-documenting code and comments (0-2 points)
- Properly formatted output (0-3 points)

Total: (0-10 points)

**Note:** decimal grades will be given for partial credit

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**Lab Procedure:**

In this lab you will use Python to determine the download speeds for different file sizes on different network connections. You will ask the user for a file size and then display the number of minutes and seconds it will take to download that file using the following network connections:

9 Kbps modem (yes, we used these long ago)  
ADSL 1.2 Mbps  
Cable Modem 3Mbps  
Ethernet 10Gbps

Conversion notes:

Kbps = kilobits per second (1000 bits)  
Mbps = megabits per second (1,000,000 bits)  
Gbps = gigabits per second (1,000,000,000 bits)

Assuming the user enters the number of MB (megabytes) where:

1 megabyte = 8 megabits    and    1 kilobyte = 8 kilobits

- The sample program executions are provided below. Examine this output carefully. Your application should reproduce this output exactly.

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**Sample Program #1: (Bolded and italicized is user-typed input)**

```
>>>lab2.py
What is the size of the file in megabytes (MB)?80000
Your file is 640000000 Kb or 640000 Mb
Download time on a 9Kbps modem: 1185185 minutes 11 seconds
Download time on a 1.2Mbps ADSL line: 8888 minutes 53 seconds
Download time on a 3Mbps cable modem: 3555 minutes 33 seconds
Download time on a 10Gbps ethernet: 1 minutes 4 seconds
```

**Sample Program #2: (Bolded and italicized is user-typed input)**

```
>>>lab2.py
What is the size of the file in megabytes (MB)?1200
Your file is 9600000 Kb or 9600 Mb
Download time on a 9Kbps modem: 17777 minutes 46 seconds
Download time on a 1.2Mbps ADSL line: 133 minutes 20 seconds
Download time on a 3Mbps cable modem: 53 minutes 20 seconds
Download time on a 10Gbps ethernet: 0 minutes 0 seconds
```

## Lab Assignment #2

	Excellent (85% or higher)	Average (60% or higher)	Needs Improving (Less than 60%)	Po nts
Core Concepts (Topics of Focus)	<ul style="list-style-type: none"> <li>• Performed mega/kilo/giga conversions correctly. Correctly converted bits to bytes and displayed minutes/second correctly.</li> <li>• Read input from user.</li> <li>• Printed output to user.</li> <li>• Used comments to document code</li> </ul>	<ul style="list-style-type: none"> <li>• Conversions are implemented, but return the wrong result.</li> <li>• Header and/or in-line comments are missing</li> <li>• Minutes/seconds shown but incorrect</li> </ul>	<ul style="list-style-type: none"> <li>• Failed to perform conversions.</li> <li>• Failed to read input from user.</li> <li>• Failed to print output to user.</li> </ul>	3
Program Flow / Code Organization	<ul style="list-style-type: none"> <li>• Program begins with input statements</li> <li>• Unit conversions are done consistently.</li> <li>• Code is organized in a logical manner with thoughtful reasoning behind it.</li> <li>• Minimal use of code (e.g. no irrelevant statements or complexity)</li> </ul>	<ul style="list-style-type: none"> <li>• Unit conversions are implemented inconsistently. (I.e. different method used for kilobits vs. megabits).</li> <li>• Program contains unused or redundant lines of code.</li> </ul>	<ul style="list-style-type: none"> <li>• Program is unreadable</li> </ul>	2
User Interface / Input/Output	<ul style="list-style-type: none"> <li>• Code prompts the user to enter number of megabytes.</li> <li>• Input prompts describes what the user should do.</li> <li>• Output includes all three required values</li> <li>• Output is descriptive to the user and is well formatted.</li> </ul>	<ul style="list-style-type: none"> <li>• Input prompt does not tell the user what to enter</li> <li>• Output does not describe what each number means</li> </ul>	<ul style="list-style-type: none"> <li>• Program does not prompt for input</li> <li>• Program does not return required output</li> </ul>	3
Syntax / Overall Coding Guidelines	<ul style="list-style-type: none"> <li>• Code runs without any errors.</li> <li>• Comments are meaningful and professional.</li> <li>• Code is clean and easy to read. Uses meaningful variable names</li> <li>• Complex algorithms (three lines or more) are commented with information on purpose and start/stop states.</li> </ul>	<ul style="list-style-type: none"> <li>• Comments are not helpful for understanding the code</li> <li>• variable names are not meaningful</li> <li>• code generates errors in edge cases</li> </ul>	<ul style="list-style-type: none"> <li>• Code generates errors in common cases</li> <li>• no comments were used</li> </ul>	2
Final Score				10

**Additional Comments:**