**ECE 1111: Engineering Computation I**

**Laboratory No. 14: Application Programming**

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| --- | --- | --- |
| Problem | Cumulative Points | Score |
| 1 | 100 |  |
| Total | 100 |  |

Notes:

1. You must code your exam solution in Python.
2. For this exam you are allowed to open a terminal window on your computer, you are allowed to web surf with Google, but you cannot use online chat or other interactive services. You can use software tools like ChatGPT to solve particular problems, but your code must be your own original work **and should use concepts discussed in this course**.
3. Your code must be placed in a subdirectory **p01** with the proper permissions. Failure to do this will cost you 50 points.

**P01:** In Exam No. 3, you were asked to write a C++ program that did the same thing as this Linux command:

ece-000\_[1]: find /data/courses/ece\_1111/2025\_00\_spring/exams/ex\_03/picone\_joseph -name "\*.csv\*" -exec grep -iH "seiz," {} \; | cut -d"," -f2,3 | sed -e "s/,/ /g" | awk '{ sum +=($2-$1)} END {print sum}'

59.8611

This command recurses through a directory tree, opens each file with “csv” in its extension (in this case, “.csv” and “.csv\_bi” match), iterates through each file finding a line containing the text “seiz,” (case-insensitive), parses it for the two numbers, and computes a running sum of the difference between these two numbers.

The files look like this:

ece-000\_[1]: cat ./data/011a8cde381f54cb8aba7c427fcd710c/011a8cde381f54cb8aba7c427fcd710c\_04/011a8cde381f54cb8aba7c427fcd710c\_04\_004.csv\_bi

# version = csv\_v1.0.0

# bname = 011a8cde381f54cb8aba7c427fcd710c\_04\_004

# duration = 1800.0000 secs

# montage\_file = 01\_tcp\_ar\_natus\_montage.txt

#

channel,start\_time,stop\_time,label,confidence

TERM,1536.0144,1539.6826,seiz,1.0000

**Implement a solution to this problem in Python.** The output must match the output above – use a format of f10.4 to print the total duration of the files found.

Your driver program should take a directory path from the command line:

p01 /data/courses/ece\_1111/2025\_00\_spring/exams/ex\_03/picone\_joseph/data

It must call a class *ComputeDuration*. In addition to a constructor, this class must have a method called *find* that recurses through a directory tree and finds the appropriate files. This method should call a second method “get\_duration” that opens a file, loop over it, parses each line, and returns the difference between the two numbers as a float.

Your class must use a method get\_duration that takes a filename as a string and returns a float value:

Def get\_duration(filename): duration = (float)0.0; ...; return duration;

which does the heavy lifting described above. Your *find* method should call this method.

The rest of the class design is up to you. You should turn in one file p01/p01.py that has executable permission.