# Lab Week 8 EXAM

## Exam 1

You will get the full lab time (2 hours 30 minutes) to work on this exam. The code must be turned in by **the end of lab** and the submission link will disappear. Cheating in any form results in an automatic zero as well as being reported for academic dishonesty.

**Sign and turn in this sheet** before you leave.

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| You MAY use these references:   * Your book (paper or e-book on computer) * Notes from 201 lecture or labs * Old programs from 201 lecture or labs * Canvas | You may NOT use these references:   * Electronic and mobile devices * Personal computers * Friends/neighbors * The internet |

Skills Required

* Exception Handling, Read and write Files, Work with arrays and vectors, Create Functions, Include Headers and other files, Loops (while, for), Conditional (if, switch), Datatypes, assignment, etc.
* Basic git commands

1. Follow the link that was given on Canvas for this Assignment to create your repository.
2. Use the directions and skills from Week 1 to clone the repository into the directory of your choosing.
3. Create a new solution in the cloned folder.

**Assignment**

1. You are given an input file called input.txt. Each line has a category; DVD, MUSIC, or TV and an amount for the item. First you will want to read through the file and place the amounts in a vector for each. Choose the appropriate datatype.
2. You will want to calculate a total, mean and median for all categories.
   1. The functions should be in a separate CPP called Lab08Utility.cpp file that has a header. Make sure you include the header in the main program.

Note: You should include <vector> and use standard namespace in the .h and .cpp file.

* 1. The median function will need to sort the vector. You may include any sorting algorithm you’ve had this semester. The median value is the middle value from a sorted collection. If there are an odd number of values, then the median value is the value in the middle. If there are 5 items, then the median value is at index 2 of the sorted vectors. If the count is even, then there are 2 indexes that straddle the middle. Take the average of those 2 for the median.

If there are no items in the vector the function should throw an error that will be caught in your main program. If an error is thrown then the median value is “nan”

* 1. The sort algorithm you use should be turned into an independent function
  2. If there are no items in the vector for the mean then it should throw an error

1. Once you’ve calculated the result, write them out separated by tabs to the file output.txt Each category will be on a separate line.

This is example output from input1.txt

DVD 70.12 10.99 14.024

TV 33.2 4.5 8.3

MUSIC 0 nan nan

1. Remember to close the output file when you are done.

**Submit your assignment**

1. Update your files on GitHub (Remember to save the files in the IDE before adding them) .sln, .cpp, .h, .vcxproj and any others.
   1. use git status to check which files have been changed and need to be staged
   2. use git add to add the files that have been added or changed
   3. use git commit -m “message” to commit to your local repository
   4. use git push to push this to the remote repository so the grader can find and validate it.
2. Check github repository that your changes and submission are correct.