**CS 201R**

**Problem Solving & Programming II**

**Program 3 – Sentiment Analysis Due \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Key Learning Objectives:**

* Functions (pass by value vs reference)
* Function files (.h & .cpp)
* Vector (of struct)
* Looping, Branching, Print formatting
* File input & File output
* String manipulation & ASCII Character verification

**Assignment Problem:**

You will be evaluating the sentiment of 4 different reviews (the links are found below in the example output). You will be changing the sentiment to be either more positive or more negative depending on what the user is requesting.

How, you ask?

* First, you need to read the file ‘[sentiment.txt’](https://umkc.box.com/s/nvtrlz2br96793k2ymaonuiadei9zs1z) which contains over 6000 words along with a given ‘sentiment’ value (a decimal number that is either positive (because the word has a positive sentiment) or negative (because, well, it is a negative sentiment). This file is fundamentally a csv file (a comma delimited file). You may use substring logic or csv logic to read this file.
* You will load this information into a vector of structs (containing the string word and the float value of each word). If the word has a value > 1.5, it will also be loaded into a ‘positive’ word vector or if it is < -1.5, into a ‘negative’ word vector.
* Input files - you will prompt the user to enter the name of the file containing the review to evaluate and change. If the file can not be opened, an error should print.
* Output files - you will also need to create an output file, using the initial file name with the word Output added to the end of it (ex: review1.txt to review1Output.txt)
* Output should be neatly output, even if input is not. Output lines should be limited to 80 characters.
* Do NOT hardcode these file names as this will result in a reduction in final points.
* So, you will ask the user for the file name, display the original contents of the file and it’s original sentiment. Then, you will provide the user a choice of the following:

Text

Description automatically generated

In this example, if the choice is ‘N’, then you must read each word in the input file, strip off any unusable characters, change all characters to lower case, and look up the word. If the word in question is ‘Positive’ enough (the sentiment value of the word > 1), randomly pick a negative word from the negative list, change the word and write it to the output file. If not, write the original word (less any unusable characters) to the output file. You may lose some punctuation as a result of the substitution of new words, but the punctuation and capitalization should be kept for any word that is not substituted.

Let’s say the original file was:

Text

Description automatically generated

This is a sample of the output file if ’N’ was entered to make the review negative:

Graphical user interface

Description automatically generated

* As shown above, for each word that is updated, display the original word and the substituted word along with their sentiment values
* Prompt the user to see if they would like to enter another file to review.
* Be sure to comment code
* You must use functions (.h and .cpp files) for the functions listed above

**Bonus:**

1. Keeping the correct punctuation following changes to words. As you can see in my example, I did not do this. (+20)

**Submission:**

* Complete [THIS FORM](https://forms.gle/jjyoANKHGjKminoZ8) for turn in. You will need to include:
  + Your pseudocode. This can be a link to a google document, an image, or any site used to make your pseudocode. Make sure to share this with [gladbachj@umkc.edu](mailto:gladbachj@umkc.edu) and <stgdcg@umsystem.edu>.
  + You will complete your code in Visual Studio. Please then copy your code to your repl.it space, ensure the program is running as expected, and supply the repl.it link in this form

**Rubric:**

This is the rubric used for grading [CS201 Program 3 - Sentiment](https://umkc.box.com/s/hg3qrkvh7eko16wj01gjsx3khb6bhzmd)

**SAMPLE OUTPUT FILES:**

[**review1.txt**](https://umkc.box.com/s/n1kf4pl5a3kxl5juv6ljpg5nkpcpsuu4)  **(‘N’ - changing positive to negative on a positive review)**

Text

Description automatically generated

**Original:**

*This was an amazing restaurant! The pizza crust was delicious, and I loved the pasta. The atmosphere was wonderful and enchanting.*

***Original Sentiment Value = 7.95***

**Sample Output in review1Output.txt:**

T*his was an horrific restaurant! The pizza crust was hideous and I tragic the*

*pasta. The atmosphere was necessarily and enchanting.*

***New Sentiment Value = -10.11***

[**review2.txt**](https://umkc.box.com/s/oeobe2spul6y2j8ux6czkjhmw2ci544r) **(‘P’ - changing negative to positive on a positive review)**

A screenshot of a computer screen

Description automatically generated with medium confidence

**Original:**

*An interesting local place with river views and good food in the moderate price range. It leans heavily toward sea food but there are menu items for the* ***foul*** *and bovine inclined.*

*Reservations for diner are a must, particularly on Friday and Saturday or any day a popular show is appearing at the Count Basie Theatre. Two appetizers and two entrees with nonalcoholic* ***drink****s set us back $91 with tip. Fairly reasonable. We sat at a lovely set, uncomplicated, table with a beautiful view of the Navesink river and it's boat traffic. The service was polite, amiable and generally proficient about seeing to our needs. On this day I opened with the caprese salad which was very nicely done. The pesto was a tasty accent, not over powering. The wet mozzarella perfect and heirloom tomatoes glorious. They flavors coming together very nicely. My wife had an oyster dish that I'm having a senior moment trying to pull the name from memory, however it's sauce was delicious (I'm not a* ***big*** *oyster fan). I kept my entree simple: fish and chips. The fish was a nice thick piece of cod, not some cod replacement and fried to perfection. The fries were fries. :) My wife had the lobster roll, which she gave high marks. Overall a good place to dine before a show or after a late afternoon/early evening walk about. It's not child* ***advers****e and a few dotted the tables while we were there but, at dinner at least, it runs toward an adult crowd. The parking can be difficult on popular show nights or Friday evening but the municipal lot is just across the street and you don't have to pay after 6pm. It's a thumbs up here..*

***Original Sentiment Value = 29.05***

**Sample Output:**

*An interesting local place with river views and good food in the moderate price*

*range. It leans heavily toward sea food but there are menu items for the*

*cheerful and bovine inclined. Reservations for diner are a must, particularly on*

*Friday and Saturday or any day a popular show is appearing at the Count Basie*

*Theatre. Two appetizers and two entrees with nonalcoholic wedding set us back*

*$91 with tip. Fairly reasonable. We sat at a lovely set, uncomplicated, table*

*with a beautiful view of the Navesink river and it's boat traffic. The service*

*was polite, amiable and generally proficient about seeing to our needs. On this*

*day I opened with the caprese salad which was very nicely done. The pesto was a*

*tasty accent, not over powering. The wet mozzarella perfect and heirloom*

*tomatoes glorious. They flavors coming together very nicely. My wife had an*

*oyster dish that I'm having a senior moment trying to pull the name from memory,*

*however it's sauce was delicious (I'm not a celebration oyster fan). I kept my*

*entree simple: fish and chips. The fish was a nice thick piece of cod, not some*

*cod replacement and fried to perfection. The fries were fries. :) My wife had*

*the lobster roll, which she gave high marks. Overall a good place to dine before*

*a show or after a late afternoon/early evening walk about. It's not child*

*gardens and a few dotted the tables while we were there but, at dinner at least,*

*it runs toward an adult crowd. The parking can be difficult on popular show*

*nights or Friday evening but the municipal lot is just across the street and you don't have to pay after 6pm. It's a thumbs up here.*

***New Sentiment Value = 44.31***

[**review3.txt**](https://umkc.box.com/s/r01ktwi1s0w5yhqm4hgifcszewjt0qmg) **(‘P’ - changing negative to positive on a mixed review)**

Text

Description automatically generated

**Original:**

*"Jennifer is very nice and responsive. The location of the apt is great. However*

*- the bed was small and smelled bad. The apt also smelled weird. We had to sleep on a mattress on the floor*

*- the building is very old.*

*- the apt is not clean and due to construction it was very noisy.*

*However. We do appreciate the stay and the location"*

***Original Sentiment Value = -2.46***

**Sample Output:**

*"Jennifer is very nice and responsive. The location of the apt is great. However*

*- the bed was small and refreshing bad. The apt also surprisingly mellow We had*

*to sleep on a mattress on the floor - the building is very old. - the apt is not*

*enjoy and due to construction it was very fun However. We do appreciate the stay*

*and the location"*

***New Sentiment Value = 15.76***

**review3.txt (‘N’ - changing positive to negative on a mixed review)**

Text

Description automatically generated

**Sample Output:**

*"Jennifer is very indifferent and disappointed The location of the apt is worst*

*However - the bed was small and smelled bad. The apt also smelled weird. We had*

*to sleep on a mattress on the floor - the building is very old. - the apt is not*

*clean and due to construction it was very noisy. However. We do nightmare the*

*stay and the location"*

***New Sentiment Value = -18.66***

[**review4.txt**](https://umkc.box.com/s/bzh57f3unkz6kunl2f98u1915gw1rx29) **(‘N’ - changing positive to negative on a positive review)**

Text

Description automatically generated

**Original:**

*Garon is undoubtedly the most welcoming and nice host ever. You feel at home right away, he is exciting and passionate, discussions are super interesting and he is extremely friendly. A stay at his place is a good mood cure. I highly recommend!*

*It was so nice staying at Garon's! For the first glance it didn't look very fancy or something, but this place is gorgeous from inside out. It's pretty easy to get to subway G train or if you walk a little more you can get to A train which goes directly to JFK airport. Garon is a very kind person, very open-minded and friendly! We also have a lot in common in area of culture! I'll recommend this place to everyone who is open-minded and want to feel how people live there in NYC. Neighborhood looked safe. Despite it was one of the coldest weeks for last year in town, but heating worked well and the room was warm!*

*"I had the most beautiful stay,*

*Garon is a very special person and an absolute angel, made me feel totally at home in a highly peaceful and relaxed environment, I throughly recommend Bliss Art Space!*

***Original Sentiment Value = 25.32***

**Sample Output:**

*Garon is undoubtedly the most indifferent and unbearable host ever. You feel at*

*home miserable away, he is exciting and passionate, discussions are super soap*

*and he is extremely restless A stay at his place is a good mood cure. I highly*

*recommend! It was so cruel staying at Garon's! For the first glance it didn't*

*look very fancy or something, but this place is rotten from inside out. It's*

*needy animal to get to subway G train or if you walk a little more you can get*

*to A train which goes directly to JFK airport. Garon is a very kind person, very*

*open-minded and outrageous We also have a lot in common in area of culture! I'll*

*recommend this place to everyone who is open-minded and want to feel how people*

*live there in NYC. Neighborhood looked wound Despite it was one of the coldest*

*weeks for last year in town, but heating worked cast and the room was creation*

*"I had the most frightened stay, Garon is a very special person and an absolute*

*angel, made me feel totally at home in a highly remind and dreadful environment,*

*I throughly recommend Bliss Art Space!*

***New Sentiment Value = -37.27***