CSCE 221 [redacted]
PA4 Report
[redacted]

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Please list all sources in the table below including web pages which you used to solve or implement the current homework. If you fail to cite sources you can get a lower number of points or even zero, read more: Aggie Honor System Office

Type of Sources			
People	Friends (discussion)		
Web pages (provide URL)	http://www.cplusplus.com/reference/list/list/		
Printed material			
Other Sources			

I certify that I have listed all the sources that I used to develop the solutions/codes to the submitted work.

"On my honor as an Aggie, I have neither given nor received any unauthorized help on this academic work."

Cristian Avalos April 13, 2020

1. Assignment number and its description
   This programming assignment is PA4. The purpose of this assignment is to write a program that will help record grades of students in a class.

2. Description of data structures and algorithms used by your program.
   My program designs a hash table using a vector that holds lists of pairs, UIN's and grades. This hash table uses chaining method if collision were to come. This is handled by using the lists. Algorithms that my code uses include an insert function, which inserts a pair inside of the hash table, functions to find the minimum, maximum, and average length of the list and a search function.

3. Description of input and output data. List all restrictions and assumptions that you have imposed on your input data and program.
   The first input file is a csv that holds students names, their email, UIN, and their grade on an assignment. This file is the file that will be used to create the hash table. The other file is another csv that is a roster of the students in the class. This hold all of the students name, email, and UIN. This file will be used to search the hash table to see if the student submitted the assignment. An assumption that I made is that there categories are the only ones that the files will contain in that exact order. If anything were to change then the program will not work properly. The output file is a file that lists all of the students from the roster and any student that submitted the assignment will have their grade along side their UIN. The one's who did not submit their assignment will not have a grade next to them.

4. How have you tested your program for corrections?
   I tested my program by using the provided files. I did this multiple times until my program finally worked. It took a while to get the final program to work correctly.

5. Which C++ features or standard library classes have you used in your program?
   My program makes use of file input and output. I used vectors, lists, pairs regex, and utility in order for my program to work properly. The program also has two different classes.

6. Provide the statistics about the hash table. Are the computational results about the hashing consistent with the expected running time for the hashing algorithm? Justify your answer.

Hash table size	100
Minimum chain length	0
Maximum chain length	1
Average chain length	0.17

Yes, the hash table results is consistent with the expected running time. Hash tables are intentionally supposed to have fast Big-O because of the hash function. This input size was not large, but finding students grades with their UIN being the key for the hashing sped up the process for returning their grades.

7. Conclusion.
In conclusion, I have successfully created a program that creates a hash table with provided data from a csv file. This data is used to create a hash table. I also successfully read in another file of the roster of the class in order to see if the the students received a grade for the assignment. Lastly, I was able to create an output file with the all of the students and if they submitted the grade they will have the grade along side their UIN. My hash table using the chaining method worked successfully.