**CMSC140 Project 4**

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**Instructor: Grigoriy A. Grinberg**

**Class: CMSC 140**

**Course CRN: 20433**

**Due Date: 11/15/2021**

**CMSC140 Project Documentation Template**

Class: CMSC140 CRN 24300

 Program: Project #4

Instructor: Grigoriy A. Grinberg

 Summary of Description: Write a program that writes to a file the number of employees in a company and the number of days absent per employee, then calculate the average number of days absent.

 Due Date: 11/15/2021

 Integrity Pledge: I pledge that I have completed the programming assignment independently.

 I have not copied the code from a student or any source.

I have not given my code to any student.

 Print your Name here: Katya Alexandra Portillo Cabrera

**Part1: Pseudo Code:** Here is a flowchart for Project 4 program:

**Diagram

Description automatically generated**

**Part2: Comprehensive Test Plan**

A good test plan should be comprehensive. This means you should have a few test cases that test when the input is in and out of range, division by 0, incorrect Data type, etc. (Provide valid and invalid input)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Cases | Input | Expected Output | Actual Output | Did Test Pass? |
| Case 1 | Number of employees in the company: 5  Employee ID:1234  Number of days Absent: 3  Employee ID: 22  Number of days Absent: 0  Employee ID: 667  Number of days Absent: 5  Employee ID: 4  Number of days Absent: 11  Employee ID: 9876  Number of days Absent: 1 | **Employee Id | Days absent**  1234 3  22 0  667 5  4 11  9876 1  The 5 employees were absent for a total of 20 days  The average number of days absent is 4.0 days. | **Employee Id | Days absent**  1234 3  22 0  667 5  4 11  9876 1  The 5 employees were absent for a total of 20 days  The average number of days absent is 4.0 days. |  |
| Case 2 | Number of employees in the company:  -2  -1  2  Employee ID:122  Number of days Absent:  -4  -3  4  Employee ID: 123  Number of days Absent: 2 | **The number of employees can not be negative! Please try again:**  **The number of days can not be negative! Please try again:**  **Employee Id | Days absent**  122 4  123 2  The 2 employees were absent for a total of 6 days.  The average number of days absent is 3.0 days. | **The number of employees can not be negative! Please try again:**  **The number of days can not be negative! Please try again:**  **Employee Id | Days absent**  122 4  123 2  The 2 employees were absent for a total of 6 days.  The average number of days absent is 3.0 days. |  |
| Case 3 | Number of employees in the company: 4  Employee ID:120  Number of days Absent: 10  Employee ID: 121  Number of days Absent: 5  Employee ID: 122  Number of days Absent: 3  Employee ID: 123  Number of days Absent: 3 | **Employee Id | Days absent**  120 10  121 5  122 3  123 2  The 4 employees were absent for a total of 20 days  The average number of days absent is 5.0 days. | **Employee Id | Days absent**  120 10  121 5  122 3  123 2  The 4 employees were absent for a total of 20 days  The average number of days absent is 5.0 days. |  |
| Case 4 | Number of employees in the company: 5  Employee ID: 231  Number of days Absent: 5  Employee ID: 232  Number of days Absent: 0  Employee ID: 233  Number of days Absent: 5  Employee ID: 234  Number of days Absent: 4  Employee ID: 235  Number of days Absent: 4 | **Employee Id | Days absent**  231 5  232 0  233 5  234 4  235 5  The 5 employees were absent for a total of 19 days  The average number of days absent is 3.8 days. | **Employee Id | Days absent**  231 5  232 0  233 5  234 4  235 5  The 5 employees were absent for a total of 19 days  The average number of days absent is 3.8 days. |  |
| Case 5 | Number of employees in the company:  -6  6  Employee ID: 3241  Number of days Absent: 5  Employee ID: 3242  Number of days Absent: 5  Employee ID: 3243  Number of days Absent: 8  Employee ID: 3244  Number of days Absent: 3  Employee ID: 3245  Number of days Absent: 10  Employee ID: 3246  Number of days Absent: 0 | **The number of employees can not be negative! Please try again:**  **Employee Id | Days absent**  3241 5  3242 5  3243 8  3244 3  3245 10  3246 0  The 6 employees were absent for a total of 31 days  The average number of days absent is 5.2 days. | **The number of employees can not be negative! Please try again:**  **Employee Id | Days absent**  3241 5  3242 5  3243 8  3244 3  3245 10  3246 0  The 6 employees were absent for a total of 31 days  The average number of days absent is 5.2 days. |  |

**Part3: Screenshots related to the Test Plan:**

**Case 1:**

**Graphical user interface, text

Description automatically generated**

**Text

Description automatically generated**

**Case 2**

**Text

Description automatically generated**

**Text

Description automatically generated**

**Case 3**

**Text

Description automatically generated**

**Text

Description automatically generated**

**Case 4**

Text

Description automatically generated

**Text

Description automatically generated**

**Case 5**

**Text

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**Text

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**Lessons Learned** <Provide answers to the questions listed above>**:**

Write about your Learning Experience, highlighting your lessons learned and learning experience from working on this project.

During project 4, some things I learned is how to properly use functions and the reason as to why they are useful to use. I learned that functions are useful for reusing code in a program and by breaking down a program into smaller functions that perform different tasks. In addition, I learned that you can write information from a program into a file. Using the ofstream statement, I learned that I could write information into the file.

Some things I struggled with while working on this project was on how to pass arguments into a function. After reviewing the chapter in Pearson Revel and attending office hours I learned that arguments are passed by the parameter in a function call. After this, I was able to write the argument through the function call and by declaring the parameter list in the function prototype:

**Function prototype with parameter list:**

int totDaysAbsent (int numOfEmployees);

double averageAbsent (double num\_of\_employees\_in\_the\_company, double tot\_days\_absent\_all\_employees);

**Argument passed through function call:**

number\_of\_days\_absent = totDaysAbsent(number\_of\_employees); //Average absent

average\_absent\_days = averageAbsent(number\_of\_days\_absent, number\_of\_employees);

In my next Project, some things I would do differently is writing pseudocode for the program instead of just doing a flowchart. While working on project 4, I found that writing pseudocode helps me to visualize the code better than doing just flowchart for the project. Overall, I was successful with being able to write information into a file and I was unsuccessful with knowing how to pass an argument into a function. The resources I used during this project was Pearson Revel and video handouts for chapter 6.

**Check List:** <Provide answers to the column Y/N or N/A >**:**

|  |  |  |  |
| --- | --- | --- | --- |
| **#** |  | **Y/N** | **Comments** |
|  | **Assignment files:** |  |  |
|  | * FirstInitialLastName\_Pr4.Moss.zip | **Yes or No** |  |
|  | * FirstInitialLastName\_Pr4.docx/.pdf | **Yes or No** |  |
|  |  |  |  |
|  | **Program compiles** | **Yes or No** |  |
|  | **Program runs with desired outputs related to a Test Plan** | **Yes or No** |  |
|  | **Documentation file:** |  |  |
|  | * Comprehensive Test Plan | **Yes or No** |  |
|  | * Screenshots related to the Test Plan | **Yes or No** |  |
|  | * Algorithms/Pseudocode (required) | **No** |  |
|  | * Flowchart (required for Design ) | **Yes** |  |
|  | * Lessons Learned | **Yes or No** |  |
|  | * Checklist is completed and included in the Documentation | **Yes or No** |  |