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**Part 1: Psuedocode**

**ITEMTRACKER CLASS HEADER FILE**

CLASS ItemTracker

PUBLIC

METHOD ReadInputData

METHOD WriteDataBackup

CONSTRUCTOR

METHOD FindItemFrequency

METHOD PrintAllItemFrequencies

METHOD PrintItemHistogram

PRIVATE

Map itemFrequency

**CLASS DEFINITION FILE (ITEMTRACKER.CPP)**

Include necessary headers

CLASS ItemTracker

PRIVATE MAP itemFrequency

METHOD ReadInputData

OPEN “CS210\_Project\_Three\_INPUT\_File.txt” for READing

IF file not found

OUTPUT “Error: Unable to open file.”

RETURN

END IF

LOOP through lines in the file

READ item from the file

Increment itemFrequency[item]

END LOOP

CLOSE the file

METHOD WriteDataBackup

OPEN “frequency.dat” for writing

LOOP through items and their frequencies in itemFrequency

WRITE item and frequency to the file

END LOOP

CLOSE the file

CONSTRUCTOR

Call ReadInputData

Call WriteDataBackup

METHOD FindItemFrequency

OUTPUT “Enter the item you wish to look for: “

INPUT searchItem

IF itemFrequency contains searchItem

OUTPUT “Frequency of “ + searchItem + “ is “ + itemFrequency[searchItem]

Else

OUTPUT searchItem + “ not found.”

END IF

METHOD PrintAllItemFrequencies

LOOP through items and their frequencies in itemFrequency

OUTPUT item + “ “ + itemFrequency[item]

END LOOP

METHOD PrintItemHistogram

LOOP through items and their frequencies in itemFrequency

OUTPUT item + “ “

LOOP from 1 to itemFrequency[item]

OUTPUT “\*”

END LOOP

OUTPUT a new line

END LOOP

**MAIN.CPP**

Include necessary headers

Main

Create an ItemTracker object itemTracker

LOOP Until choice is 4

OUTPUT “Menu Options:”

OUTPUT “1. Find the frequency of a specific item.”

OUTPUT “2. Print the frequency of all items.”

OUTPUT “3. Print item frequencies as a histogram.”

OUTPUT “4. Exit the program.”

INPUT choice

Switch choice

Case 1

Call itemTracker.FindItemFrequency

Case 2

Call itemTracker.PrintAllItemFrequencies

Case 3

Call itemTracker.PrintItemHistogram

Case 4

OUTPUT “Exiting the program.”

Default

OUTPUT “Invalid choice. Please try again.”

END Switch

Restart LOOP until choice is 4

**Part 2: Code Structure Breakdown**

A screen shot of a computer program

Description automatically generated

PRIVATE MEMBERS:

itemFrequency : private map for storing the input data and counting the frequency.

dataFile: Constant string used for the output file’s name.

method ReadInputData() : Used to read the grocery list file to the map object.

A computer screen shot of a program code

Description automatically generated

WriteDataBackup() : Writes the map object to the constant private member “dataFile”. A computer code on a black background

Description automatically generated

PUBLIC MEMBERS:

ItemTracker() : Constructor method. Calls private methods “ReadInputData()” and “WriteDataBackup()”.

FindItemFrequency(): Finds the user’s item to search for and outputs the frequency.

A computer screen shot of a program code

Description automatically generated

PrintAllFrequencies(): Prints all map items and the frequency for each listed item.

A computer screen shot of a code

Description automatically generated

PrintItemHistogram(): Prints all map items and a “\*” for each time the item is listed in the input file.

A computer screen with text

Description automatically generated

MAIN():

Creates map object, calling the contructor and inputing the provided file into the created map. Then creates and saves the backup file.

Outputs the menu

Retrieves user’s choice

Calls appropriate method for the user’s choiceA screenshot of a computer program

Description automatically generated.

**Part 3: Program Walkthrough**

Main Menu:

A screenshot of a computer program

Description automatically generated

Option 1: Enter an item and program outputs frequency of that item from the provided file.

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Description automatically generated

Option 2: Outputs all the items and their frequency from the provided file.

A screenshot of a computer

Description automatically generated

Option 3: Outputs all the items and the “Histogram” of the frequency

A screenshot of a computer program

Description automatically generated

Option 4: Exits the program.



The program will display the menu after each choice unless the user inputs option 4 to close the program.

Input validation is taken into account. If the user inputs a string or an out-of-range number (not 1-4), the program will ask for the user’s input again.

A screenshot of a computer program

Description automatically generated