**Item-Tracking Program Documentation**

**Program Overview:**

The item-tracking program was designed for Corner Grocer to analyze text records of items purchased throughout the day. The program helps the grocer understand item frequency, print the list of item frequencies, generate a histogram, and store the frequency data for backup purposes. This solution is implemented in C++ and uses file input/output (I/O) and maps to track the frequency of each item.

**Class Design:**

The core of the program is the ItemTracker class. This class is responsible for reading data from the input file, maintaining a frequency map of items, and providing functionalities to the user through the menu-driven interface.

The class has the following members:

* **Private Member:**
  + **std::map<std::string, int> itemFrequency**: A map that stores each item and the number of times it appears in the input file.
* **Public Methods:**
  + **void readInputFile(const std::string& fileName):** Reads from the input file and updates the item frequency map.
  + **int getItemFrequency(const std::string& itemName):** Returns the frequency of a specific item.
  + **void printAllItems():** Prints the entire list of items with their frequencies.
  + **void printHistogram():** Prints a histogram representing item frequencies.
  + **void writeFrequencyToFile():** Writes the frequency data to a backup file, frequency.dat.

**Menu Interface:**

The user interacts with the program through a simple text-based menu, which provides four options:

1. **Look up item frequency:** Allows the user to search for an item and see how many times it has been purchased.
2. **Print all item frequencies:** Displays a list of all items and their respective purchase frequencies.
3. **Print item frequency histogram:** Shows a histogram where each item’s frequency is represented by asterisks.
4. **Exit:** Exits the program and writes the frequency data to the backup file.

**File Input and Output:**

* **Input File:** The program reads from CS210\_Project\_Three\_Input\_File.txt, which contains a list of items purchased throughout the day. The items are processed and stored in the frequency map.
* **Backup File:** Upon exit, the program writes the item frequency data to frequency.dat as a backup.

**Key Features:**

* **Item Frequency Lookup:** The user can search for the frequency of a specific item.
* **Comprehensive Listing:** The user can print all items with their respective frequencies.
* **Histogram:** A graphical representation of the data is printed with asterisks to visualize item frequencies.
* **Backup Data:** The program stores the item frequencies in frequency.dat for future reference.

**Sample Output:**

Here are some sample outputs from the program.

1. **Item Frequency List:**

A black background with white text

Description automatically generated

1. **Item Frequency Histogram:**

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Description automatically generated

**Code Snippet:**

Here’s a brief look at the method responsible for printing the histogram:

A computer code with colorful text

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**Challenges:**

One of the key challenges was handling file I/O efficiently, particularly reading from the input file and writing the frequency data to a backup file. Using maps simplified the process of tracking item frequencies.

**Conclusion:**

The item-tracking program successfully meets the Corner Grocer’s requirements, providing a simple interface for analyzing purchased items, generating frequency data, and visualizing it through a histogram. It also ensures that data is saved for future use via backup functionality.