Instaventory

A convenience store inventory management solution

Group 3
Olivier Chan - *File IO, Linked List*
Luis Guerrero - *User Interface, User IO*
Hiren Rathod - *Hash Table*
Yue Pan - *Binary Search Tree*

What is Inventory Management (software)?

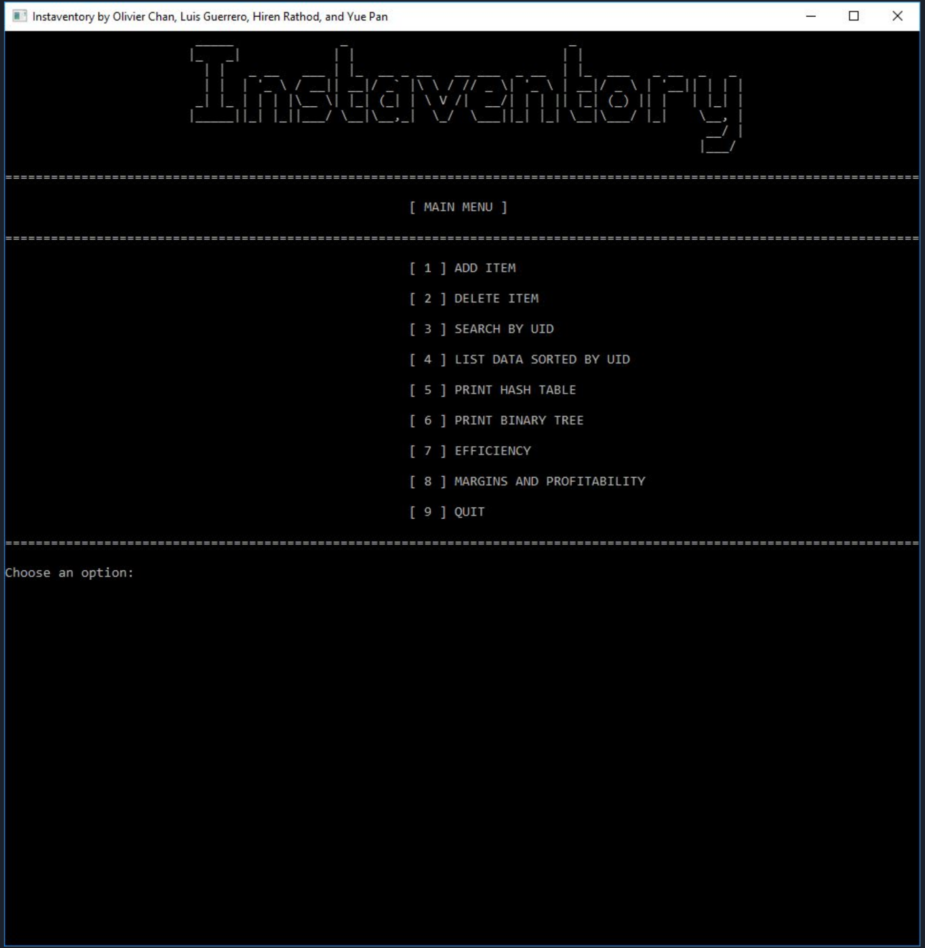
- Inventory Management
  - The small or large scale control and overseeing of physical materials and goods.
  - Examples of use cases:
    - Helping to decide when to purchase new goods for retail
    - Calculating profits/margins
- Can be accomplished with paper records, spreadsheets, software, etc.

Our solution, “Instaventory”

- Inventory Management software
  - Designed for individual, small scale stores
    - Gas stations
    - Convenience stores (7-Eleven, Liquor stores)
- Features
  - Save and load data records from a file
  - Add and delete data records
  - View ordered lists of records
  - View records ordered by profit margin
  - And more!

User Interface

- Menu / Option based
  - Navigation by choosing a number option
- Input validation
  - Can’t enter invalid options/data - reason will be given and asked to retry



Instaventory by Olivier Chan, Luis Guerrero, Hiren Rathod, and Yue Pan

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============================================================================================================================

                                              [ MAIN MENU ]

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                                              [ 1 ] ADD ITEM

                                              [ 2 ] DELETE ITEM

                                              [ 3 ] SEARCH BY UID

                                              [ 4 ] LIST DATA SORTED BY UID

                                              [ 5 ] PRINT HASH TABLE

                                              [ 6 ] PRINT BINARY TREE

                                              [ 7 ] EFFICIENCY

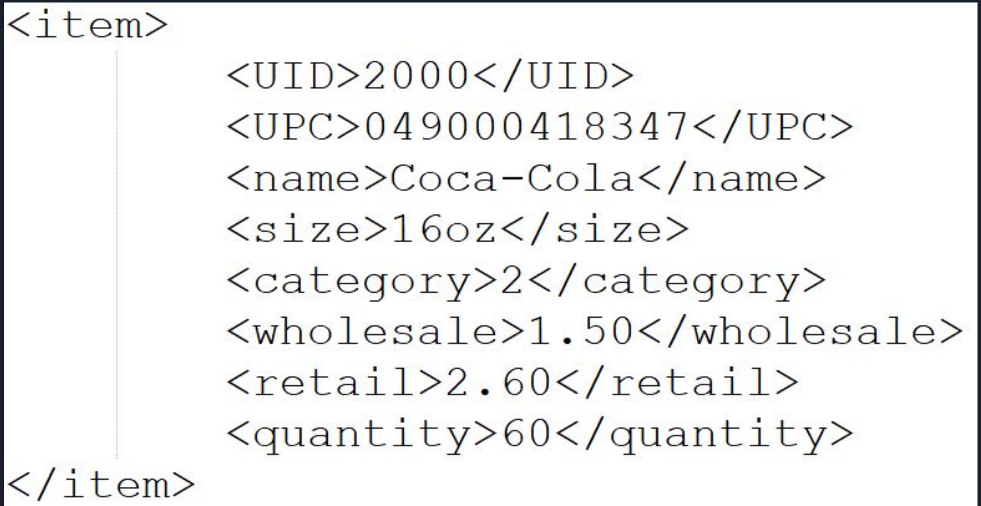
                                              [ 8 ] MARGINS AND PROFITABILITY

                                              [ 9 ] QUIT

============================================================================================================================
Choose an option:
```

How Products/Items are stored in file

- UID - Unique Identifier
- UPC - Universal Product Code
  - A.K.A. Barcode
- Name
- Size (Number, Weight, Volume)
- Category
  - Snacks
  - Drinks
  - Tobacco
  - Lottery & Scratch Cards
  - Miscellaneous
- Wholesale / Retail Price
- Quantity in Stock

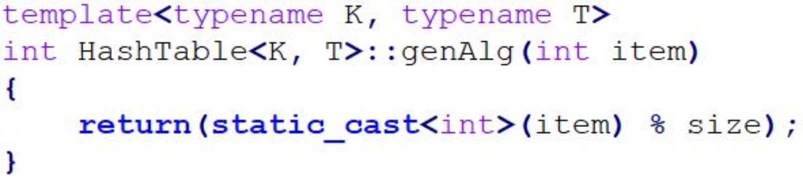


```
<item>
        <UID>2000</UID>
        <UPC>049000418347</UPC>
        <name>Coca-Cola</name>
        <size>16oz</size>
        <category>2</category>
        <wholesale>1.50</wholesale>
        <retail>2.60</retail>
        <quantity>60</quantity>
</item>
```

Data Structures used in Instaventory

- Dynamic Array
  - Used as the primary structure for storing data
  - All other ADTs reference from the dynamic array
- Linked List
  - Used in general use cases
  - Used in hash table ADT for separate chaining
- Hash Table
  - Used to retrieve items by UID efficiently
- Binary Search Tree
  - Used to efficiently print items by sorted profit margins

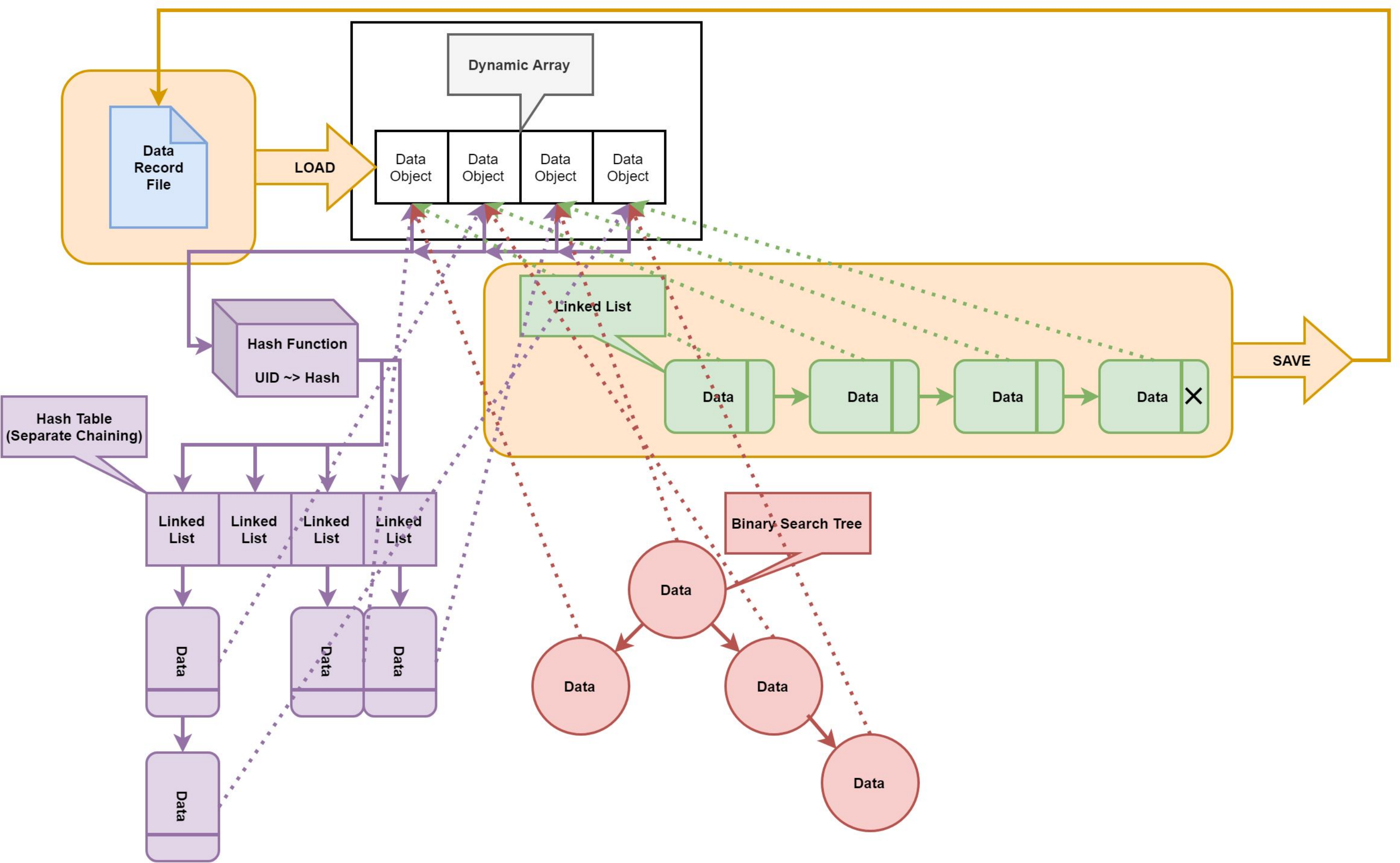
Hash Table



```
template<typename K, typename T>
int HashTable<K, T>::genAlg(int item)
{
    return(static_cast<int>(item) % size);
}
```

- Hash function
  - Modulo hashing
- Collisions
  - Resolved using separate chaining, hash table is an array of Linked Lists
- Examples:
  - Item UID 1000 gets hashed into 1000 % 101 = 91
  - Item UID 3005 gets hashed into 3005 % 101 = 76
  - Item UID 2111 gets hashed into 2111 % 101 = 91 **(collision!)**
    - Item 2111 gets “chained” to the end of the list containing Item 1000
    - Index 91 now contains [91] Item 1000 ---> Item 2111

Data Structure Diagram



Demonstration
and
Q&A