INF212
ALGORITHMS AND PROGRAMMING

PROJECT-3
Grocery Delivery Automation Program

The deadline is Wednesday, May 5, 2024, at 00:00.

Projects that are not delivered on time are not accepted.

Upload the project to the Project 3 assignment section of the INF212 class.

The questions can be asked to course lecturer Dr. Tuba GÖZEL and teaching assistant Talha Saydam.

Upload your files as followings:

- **After uploading your source files, you must use TURN IN button (GÖNDER butonu) in the system, otherwise it will be a draft of your version and will not be accepted.**
- **MS Teams "INF212" class is the directory for your files.**
- **Do not create a folder or RAR or whatever, just UPLOAD your source codes.**
- **Source codes must be named as: "delivery_automation.h", "delivery_automation.c" and "main.c"**

PROJECT 3

In this project, it is expected that a grocery delivery automation program will be developed with the help of product, customer, and grocery store information. The analysis of the purchase products should be made and shown according to the customer location, product type, amount, and nearest grocery store locations. The data will be kept using singly linked list feature.

The grocery delivery automation menu can be designed as follows:

1. Sales
2. Customer Information
3. Store Information
4. Product Information
5. Customer Analysis
6. Product Analysis (Bonus)

After selecting the sales menu, the purchasing process should be started by entering the customer number.
In product purchase, the product number and quantity should be entered then the product cost should be calculated, and the purchase data should be stored. After that the next product purchase process can be passed.
After the purchased items are finished, the shipping fee should be calculated, and the purchase process should be completed. The shipping fee should be calculated according to the distance of the customer and the shop.

1. Sales

    1.1. Customer Number

    1.2. Product Sales

        1.2.1. Find product number
        1.2.2. Enter amount

    1.3. Invoice

2. Customer Information

    2.1. All customer
    2.2. Single customer

In the Customer Information section, the information (ID, name, and address of the customers) of all customers or a single customer should be listed. The choice can be made from the menu.

3. Stote Information

    3.1. All stores
    3.2. Single store
    3.3. Product list of a selected store

In the store information section, the information (ID, name, and address of the stores) of all stores or a single store, the product list of a selected store should be listed. The choice can be made from the menu.

4. Product Information
    4.1. All products
    4.2. According to the product type
    4.3. Single product

In the Product Information section, the information of all products, products according to product type or a single product should be listed. The choice can be made from the menu.

5. Customer Analysis
    5.1. Products purchased by a customer
    5.2. Total amount of purchased by a customer
    5.3. Total amount of products purchased by all customer
    5.4. Customers shipping fee

In the Customer Analysis section, the products purchased by a customer should be listed.
The total amount of the products purchased by a customer’s invoice should be listed.
The total amount of the products purchased by all the customers should be listed.
The total shipping costs of the customers should be listed.

The Product Analysis section is optional, it will be evaluated as bonus. In the Product Analysis section, the total purchase amount of the product determined by the user should be listed and shown its quantity.
The total purchase amount of a product type should be listed.
The total purchase amount for all products should be listed.

6. Product Analysis (Bonus)

    6.1. Total purchase quantity of a product
    6.2. Total purchase amount of a product type
    6.3. Total purchase amount of all products

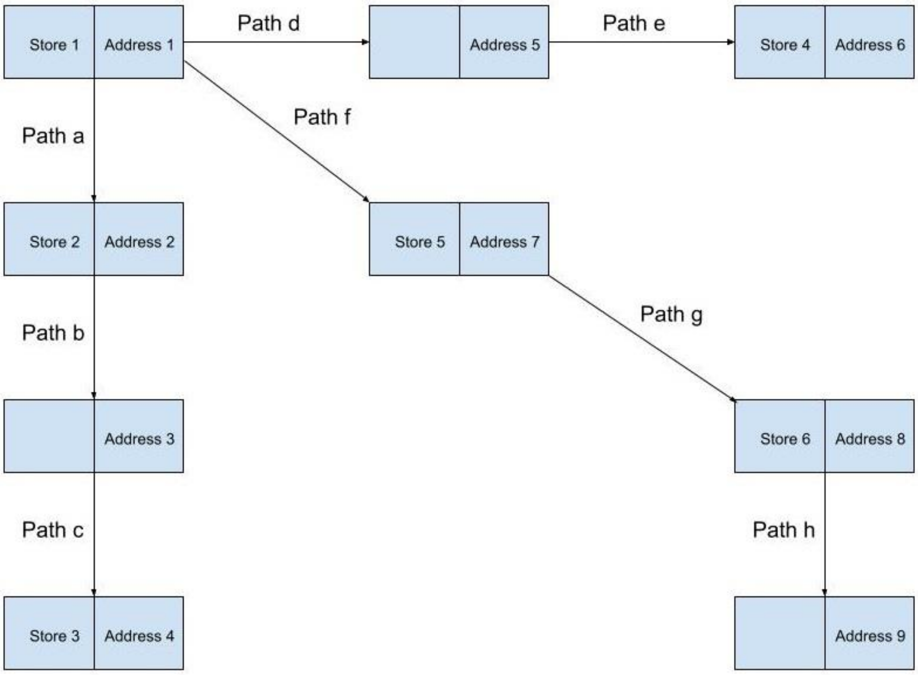

Figure: Plot of the addresses and the store locations with their paths.

The grocery store locations are shown in Figure. The customer's location must be one of the addresses in the figure and it must be defined by the user. The algorithm must find the closest possible store to purchase the items ordered by the customer. The list of ordered products must also be defined by the user. For simplicity all the stores have all the products, and the amount of the products is not important. Product lists and customers' information are given as a separate excel file.

Address 1 in Figure should be the head of the linked list. In Address 1, firstly, one of the main paths (Path a, Path f or Path d) should be chosen according to the customer's address. Then the algorithm should find the closest store to the customer.

The program should be tested using the excel file ("Proje1.xlsx").

A header file example for the project:

```
#ifndef delivery_automation_h_
#define delivery_automation_h_

struct customer{
        int ID;
        char name[50];
        int address;
        struct Customer *nextCustomerPtr;
};

typedef struct customer Customer;
typedef Customer *CustomerPtr;

struct product{
        int ID;
        char name[50];
        unsigned int type : 4;
        double price;
        struct Product *nextProductPtr;
};

typedef struct product Product;
typedef Product *ProductPtr;

struct store{
        int ID;
        char name[50];
        int address;
        struct Store *nextStrorePtr;
};
```

```
typedef struct store Store;
typedef Store *StorePtr;

void insertCustomer( CustomerPtr *cPtr, int c_ID, char* c_name, int c_type, int c_address);
int deleteCustomer( CustomerPtr *cPtr, int c_ID);

int getCustomerID( CustomerPtr *cPtr, char* c_name);
char* getCustomerName( CustomerPtr *cPtr, int c_ID);
int getCustomerAddress( CustomerPtr *cPtr, int c_ID);


#endif
```