# DSA Lab 2 - OOP Revision (53457) M. Abdullah

#### **Problem 1:**

Design a class named CustomerData.

The CustomerData class should have the following member variables:

- customerNumber
- Customer Name
- Address
- mailingList

The customerNumber variable will be used to hold a unique integer for each customer. The mailingList variable should be a bool. It will be set to true if the customer wishes to be on a mailing list, or false if the customer does not wish to be on a mailing list. Write appropriate getter setter functions for these member variables.

## **Problem Solving**

None needed as everything is given in question description

### Code

```
#include <iostream>
#include <string>
using namespace std;
class CustomerData {
```

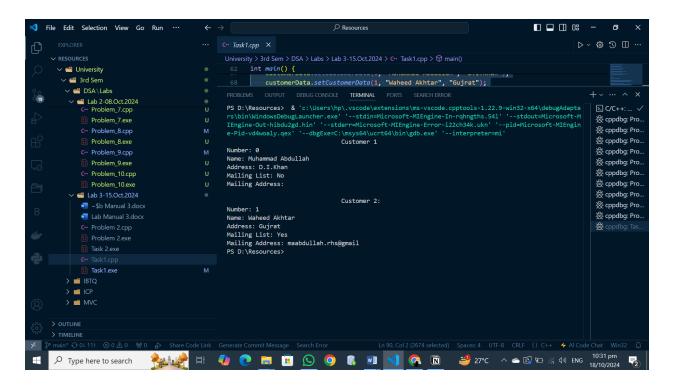
```
private:
    int *customerNumber = new int[3];
    string *customerName = new string[3];
    string *customerAddress = new string[3];
    bool *mailingList = new bool[3];
    string *mailingAddress = new string[3];
public:
    CustomerData() {
        for (int i = 0; i < 3; i++) {
            customerNumber[i] = 0;
            customerName[i] = "";
            customerAddress[i] = "";
            mailingList[i] = false;
            mailingAddress[i] = "";
        }
    }
    void setCustomerData(int num, string name, string address)
        customerNumber[num] = num;
        customerName[num] = name;
        customerAddress[num] = address;
    }
    int getCustomerNumber(int index) {
        return customerNumber[index];
    }
    string getCustomerName(int index) {
        return customerName[index];
    }
    string getCustomerAddress(int index) {
        return customerAddress[index];
```

```
}
    bool getMailingList(int index) {
        return mailingList[index];
    }
    string getMailingAddress(int index) {
        return mailingAddress[index];
    }
    void setMailingList(int index, bool status) {
        mailingList[index] = status;
    }
    void setMailingAddress(int index, string address) {
        mailingAddress[index] = address;
    }
};
int main() {
    CustomerData customerData;
    customerData.setCustomerData(0, "Muhammad Abdullah", "D.I.Kl
    customerData.setCustomerData(1, "Waheed Akhtar", "Gujrat");
    customerData.setCustomerData(2, "Faizan Umer", "Lahore");
    cout << "\t\t\tCustomer 1" << endl;</pre>
    cout << "Number: " << customerData.getCustomerNumber(0) << <</pre>
    cout << "Name: " << customerData.getCustomerName(0) << endl</pre>
    cout << "Address: " << customerData.getCustomerAddress(0) <
    cout << "Mailing List: " << (customerData.getMailingList(0)</pre>
    cout << "Mailing Address: " << customerData.getMailingAddres</pre>
```

```
customerData.setMailingList(1, true);
customerData.setMailingAddress(1, "maabdullah.rhs@gmail");

cout << "\n\t\t\t\t\tCustomer 2:" << endl;
cout << "Number: " << customerData.getCustomerNumber(1) << cout << "Name: " << customerData.getCustomerName(1) << endl cout << "Address: " << customerData.getCustomerAddress(1) << cout << "Mailing List: " << (customerData.getMailingList(1) cout << "Mailing Address: " << customerData.getMailingAddres return 0;
}</pre>
```

## Output



## **Problem 2:**

A retail store has a preferred customer plan where customers may earn discounts on all their purchases. The amount of a customer's discount is determined by the

amount of the customer's cumulative purchases in the store.

- When a preferred customer spends \$500, he or she gets a 5% discount on all future purchases.
- When a preferred customer spends \$1,000, he or she gets a 6% discount on all future purchases.
- When a preferred customer spends \$1,500, he or she gets a 7% discount on all future purchases.
- When a preferred customer spends \$2,000 or more, he or she gets a 10% discount on all future purchases.

Design a class named PreferredCustomer, which is derived from the CustomerData class you created. The PreferredCustomer class should have the following member variables:

- purchasesAmount (a double)
- discountLevel (a double)

provide default and parameterized constructor (with super keyword set values of parent's attributes), and toString method.

The purchases Amount variable holds the total of a customer's purchases to date.

The discountLevel variable should be set to the correct discount percentage, according to the store's preferred customer plan.

Also calculate discount Amount based on discount.

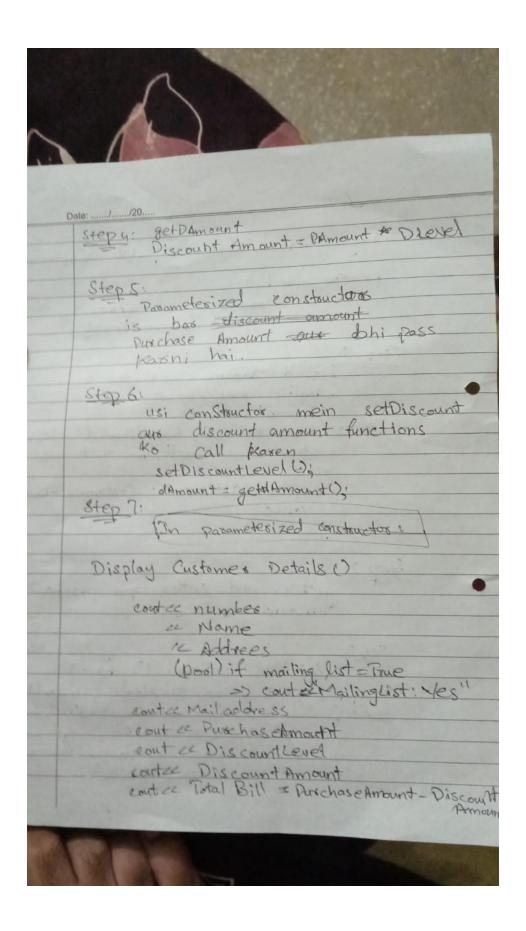
Provide getters as well.

Write appropriate member functions for this class,

Now in Main class create and ArrayList and add customers into it and display the customers details, purchase of each customer along with discount he/she gets.

# **Problem Solving**

class Preffered Customer Dublic Customer Data double purchaseAmount; double discountlevel; protected: Default Param Constructors initialize purchase Amount and Step 1 discountLevel to 0 \* We have to call base parent class constructor as well, for that we Preffered Customes (): Customes Data () ? 11code gettes and setter for purchase Step 31 set Discoutitlevel 1) function if pamount 5=2000 =) allevel = 0.10(10%) elseif 11 >= 1500 and <2000=) devel = 6.071 11 1 3 = 1000 11 215000 11 = 0 0611 11 11 9=500 11 2100000 11 =0.051 else devel = 0 (0%)



#### Code

```
#include <iostream>
#include <string>
#include <vector>
using namespace std;
class CustomerData {
private:
    int customerNumber;
    string customerName;
    string customerAddress;
    bool mailingList;
    string mailingAddress;
public:
    CustomerData() {
        customerNumber = 0;
        customerName = "";
        customerAddress = "";
        mailingList = false;
        mailingAddress = "";
    }
    CustomerData(int num, string name, string address, bool mail
        customerNumber = num;
        customerName = name;
        customerAddress = address;
        mailingList = mailingListStatus;
        mailingAddress = mailingAddr;
    }
```

```
int getCustomerNumber() {
        return customerNumber;
    }
    string getCustomerName() {
        return customerName;
    }
    string getCustomerAddress() {
        return customerAddress;
    }
    bool getMailingList() {
        return mailingList;
    }
    string getMailingAddress()
        return mailingAddress;
    }
    void setMailingList(bool status) {
        mailingList = status;
    }
    void setMailingAddress(string address) {
        mailingAddress = address;
    }
};
class PreferredCustomer : public CustomerData {
private:
    double purchasesAmount;
    double discountLevel;
```

```
void setDiscountLevel() {
                                  if (purchasesAmount >= 2000) {
                                                   discountLevel = 0.10;
                                  } else if (purchasesAmount >= 1500) {
                                                   discountLevel = 0.07;
                                 } else if (purchasesAmount >= 1000) {
                                                   discountLevel = 0.06;
                                  } else if (purchasesAmount >= 500) {
                                                   discountLevel = 0.05;
                                 } else {
                                                   discountLevel = 0.0;
                                  }
                }
public:
                PreferredCustomer() : CustomerData() {
                                  purchasesAmount = 0;
                                  discountLevel = 0;
                }
                PreferredCustomer(int num, string name, string address, bool
                                   : CustomerData(num, name, address, mailingListStatus, mailingListStatu
                                  setDiscountLevel();
                }
                double getPurchasesAmount() {
                                   return purchasesAmount;
                }
                double getDiscountLevel() {
                                  return discountLevel;
```

```
}
    double getDiscountAmount() {
        return purchasesAmount * discountLevel;
    }
    void displayCustomerDetails() {
        cout << "Number: " << getCustomerNumber() << endl;</pre>
        cout << "Name: " << getCustomerName() << endl;</pre>
        cout << "Address: " << getCustomerAddress() << endl;</pre>
        cout << "Mailing List: " << (getMailingList() ? "Yes" :</pre>
        cout << "Mailing Address: " << getMailingAddress() << er</pre>
        cout << "Total Purchases: $" << purchasesAmount << endl</pre>
        cout << "Discount Level: " << (discountLevel * 100) << '</pre>
        cout << "Discount Amount: $" << getDiscountAmount() << e</pre>
    }
};
int main() {
    vector<PreferredCustomer> customers;
    customers.push_back(PreferredCustomer(1, "Muhammad Abdullah'
    customers.push back(PreferredCustomer(2, "Waheed Akhtar", "(
    customers.push_back(PreferredCustomer(3, "Faizan Umer", "Lal
    for (int i = 0; i < customers.size(); i++) {
        cout << "\n\t\tCustomer " << i + 1 << " Details:\n";</pre>
        customers[i].displayCustomerDetails();
    }
    return 0;
}
```

## **Output**

