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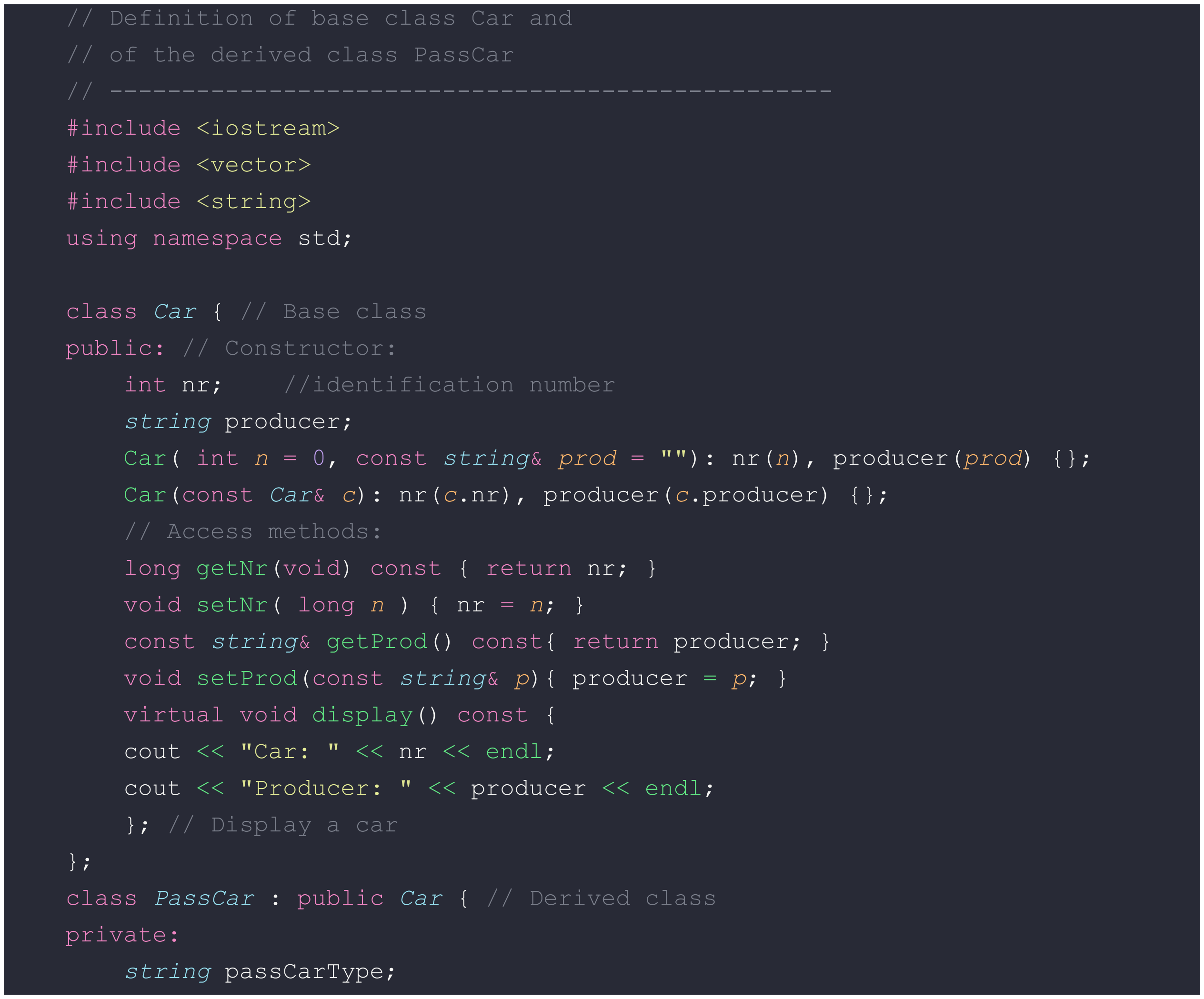
CS360L

8/8/2022

LAB #9

1.

Source code:



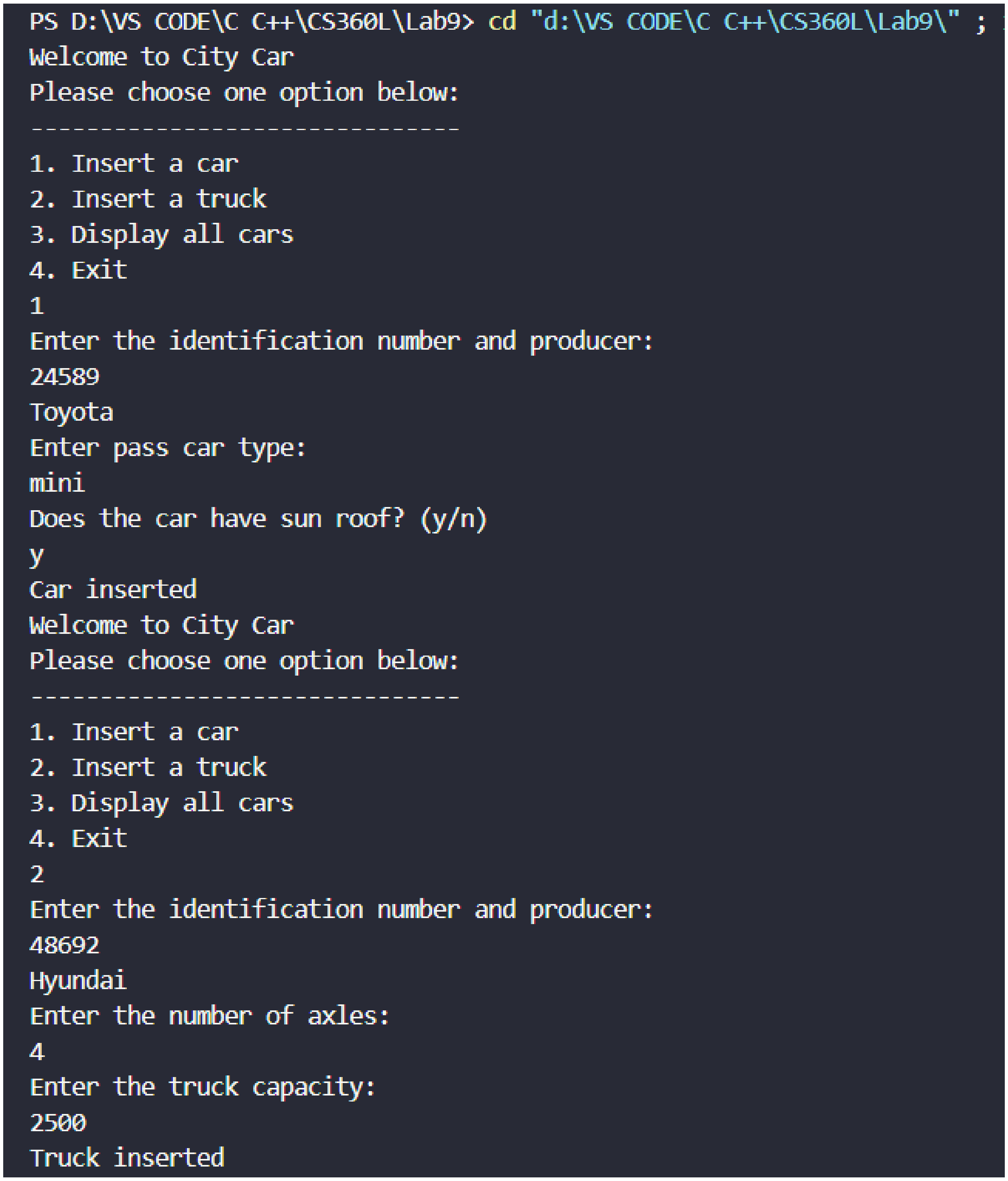
```cpp
// Definition of base class Car and
// of the derived class PassCar
// ---------------------------------------------------
#include <iostream>
#include <vector>
#include <string>
using namespace std;

class Car { // Base class
public: // Constructor:
    int nr;    //identification number
    string producer;
    Car( int n = 0, const string& prod = ""): nr(n), producer(prod) {};
    Car(const Car& c): nr(c.nr), producer(c.producer) {};
    // Access methods:
    long getNr(void) const { return nr; }
    void setNr( long n ) { nr = n; }
    const string& getProd() const{ return producer; }
    void setProd(const string& p){ producer = p; }
    virtual void display() const {
    cout << "Car: " << nr << endl;
    cout << "Producer: " << producer << endl;
    }; // Display a car
};
class PassCar : public Car { // Derived class
private:
    string passCarType;
```

```
        bool sunRoof;
    public: // Constructor:
        PassCar(): Car() {
            passCarType = "";
            sunRoof = false;
        };
        PassCar( const string& tp, bool sd, int n, const string& h): Car(n,h),
passCarType(tp), sunRoof(sd) {};
        PassCar(const   PassCar&   pc):   Car(pc),   passCarType(pc.passCarType),
sunRoof(pc.sunRoof) {};
        ~PassCar() {}; // Destructor
        // Access methods:
        const string& getType() const{ return passCarType; }
        void setType( const string s) { passCarType = s; }
        bool getSunRoof() const { return sunRoof; }
        void setSunRoof( bool b ) { sunRoof = b; }
        void display() const{
        Car::display();
        cout << "PassCar: " << passCarType << endl;
        cout << "SunRoof: " << sunRoof << endl;
        };
        void getPassCar() {
            char b;
            cout << "Enter the identification number and producer: " << endl;
            cin >> nr;
            cin >> producer;
            cout << "Enter pass car type: " << endl;
            cin >> passCarType;
            cout << "Does the car have sun roof? (y/n)" << endl;
            cin >> b;
            if (b == 'y') {
                sunRoof = true;
            }
            else {
                sunRoof = false;
            }
        }
    };
    class Truck : public Car {
    private:
        int axles;
        double tons;
    public:
        Truck(): Car() {
            axles = 0;
            tons = 0;
        };
        Truck( int a, double t, int n, const string& hs) : Car(n,hs), axles(a), 
tons(t) {};
        Truck(const Truck& t): Car(t), axles(t.axles), tons(t.tons) {};
        ~Truck() {};
        void setAxles(int l){ axles = l;}
        int getAxles() const { return axles; }
        void setCapacity( double t) { tons = t;}
        double getCapacity() const { return tons; }
        void display() const{
        Car::display();
        cout << "Axles: " << axles << endl;
        cout << "Capacity: " << tons << endl;
        };
        void getTruck(){
        bool bl;
        cout << "Enter the identification number and producer: " << endl;
        cin >> nr;
        cin >> producer;
        cout << "Enter the number of axles: " << endl;
        cin >> axles;
        cout << "Enter the truck capacity: " << endl;
        cin >> tons;
        }
    };
    class CityCar {
    public:
        Car* cars[100];
        int numCars;
        CityCar() {
        numCars = 0;
        }
        ~CityCar() {
        for (int i = 0; i < numCars; i++) {
            delete cars[i];
        }
        }
        bool insertCar() {
        if (numCars < 100) {
            PassCar* pc = new PassCar();
            pc->getPassCar();
            cars[numCars] = pc;
            numCars++;
        }
```

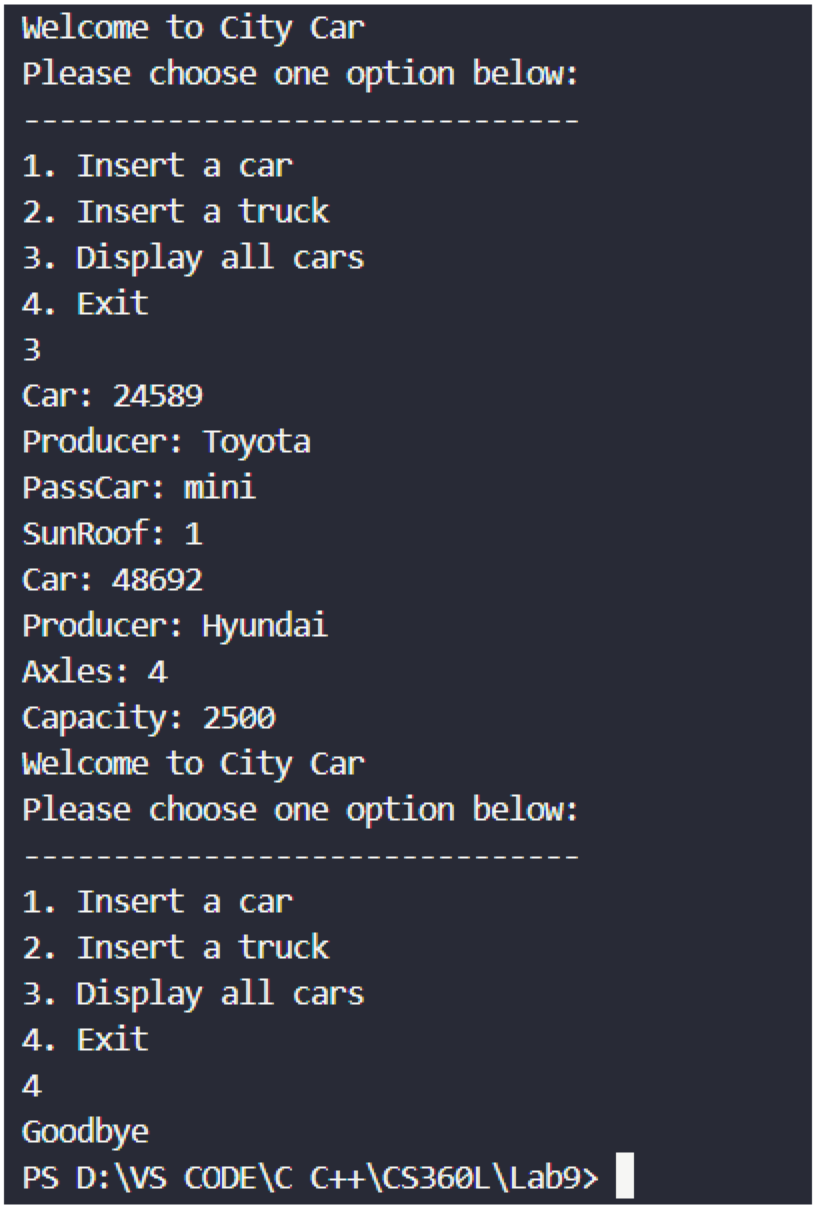
```cpp
else {
    return false;
}
return true;
}
bool insertTruck() {
if (numCars < 100) {
    Truck* tk = new Truck();
    tk->getTruck();
    cars[numCars] = tk;
    numCars++;
}
else {
    return false;
}
return true;
}
void display() {
for (int i = 0; i < numCars; i++) {
    cars[i]->display();
}
}

int menu(){
    bool bl;
    int choice;
    cout << "Welcome to City Car" << endl;
    cout << "Please choose one option below: " << endl;
    cout << "------------------------------- " << endl;
    cout << "1. Insert a car" << endl;
    cout << "2. Insert a truck" << endl;
    cout << "3. Display all cars" << endl;
    cout << "4. Exit" << endl;
    cin >> choice;
    if (choice == 1) {
        bl = insertCar();
        if (bl == true) {
            cout << "Car inserted" << endl;
        }
        else {
            cout << "No more space" << endl;
        }
    }
    else if (choice == 2) {
        bl = insertTruck();
```

```
            if (bl == true) {
                cout << "Truck inserted" << endl;
            }
            else {
                cout << "No more space" << endl;
            }
        }
        else if (choice == 3) {
            display();
        }
        else if (choice == 4) {
            cout << "Goodbye" << endl;
        }
        else {
            cout << "Invalid choice" << endl;
        }
        return 0;
    }
};

int main() {
CityCar a;
a.menu();
a.menu();
a.menu();
a.menu();

return 0;
}
```

Run program & result:



```
PS D:\VS CODE\C C++\CS360L\Lab9> cd "d:\VS CODE\C C++\CS360L\Lab9\" ;
Welcome to City Car
Please choose one option below:
-------------------------------
1. Insert a car
2. Insert a truck
3. Display all cars
4. Exit
1
Enter the identification number and producer:
24589
Toyota
Enter pass car type:
mini
Does the car have sun roof? (y/n)
y
Car inserted
Welcome to City Car
Please choose one option below:
-------------------------------
1. Insert a car
2. Insert a truck
3. Display all cars
4. Exit
2
Enter the identification number and producer:
48692
Hyundai
Enter the number of axles:
4
Enter the truck capacity:
2500
Truck inserted
```



```
Welcome to City Car
Please choose one option below:
-------------------------------
1. Insert a car
2. Insert a truck
3. Display all cars
4. Exit
3
Car: 24589
Producer: Toyota
PassCar: mini
SunRoof: 1
Car: 48692
Producer: Hyundai
Axles: 4
Capacity: 2500
Welcome to City Car
Please choose one option below:
-------------------------------
1. Insert a car
2. Insert a truck
3. Display all cars
4. Exit
4
Goodbye
PS D:\VS CODE\C C++\CS360L\Lab9>
```

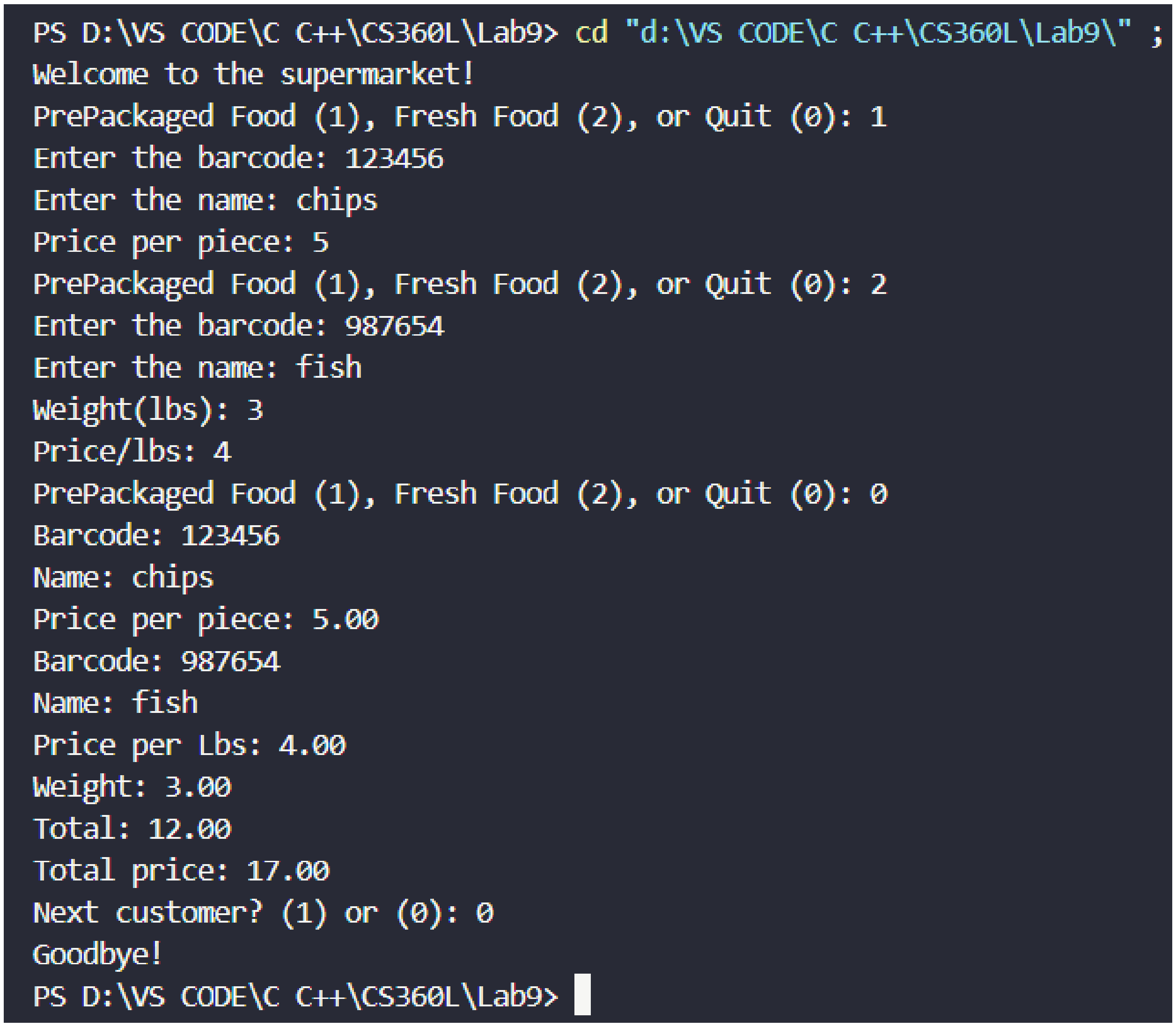
2.

Source code:

```
#include <iostream>
#include <string>
#include <iomanip>
using namespace std;
class Product{
  private:
    long bar;
    string name;
  public:
    Product(long b = 0L, const string& s = ""): bar(b), name(s){ }
    virtual ~Product(){}
  // Access methods as previously used.
    virtual void scanner(){
        cout << "Enter the barcode: ";
        cin >> bar;
        cout << "Enter the name: ";
        cin >> name;
    }; // Virtual now!
    virtual void printer() const{
        cout << "Barcode: " << bar << endl;
        cout << "Name: " << name << endl;
    };
    virtual double getProductPrice() const { return 0.0; }
};
class PrepackedFood : public Product{
  private:
    double pce_price;
  public:
    PrepackedFood(double p = 0.0,long b = 0L, const string& s = ""): Product(b, s),
pce_price(p) {}
    void setPrice(double p){ pce_price = p;}
    double getPrice()const { return pce_price; }
    double getProductPrice() const{ return pce_price; }
    void scanner(){
      Product::scanner();
      cout << "Price per piece: "; cin >> pce_price;
    }
    void printer() const{
      Product::printer();
      cout << fixed << setprecision(2)
            << "Price per piece: " << pce_price << endl;
    }
};
class FreshFood : public Product{
  private:
    double wght;
    double lbs_price;
  public:
    FreshFood(double g = 0.0, double p = 0.0,long b = 0L, const string& s = ""):
Product(b, s), wght(g), lbs_price(p) {}
    void setWght(double g) { wght = g;}
    double getWght()const { return wght; }
```

```cpp
    void setPrice(double p) { lbs_price = p;}
    double getPrice()const { return lbs_price; }
    double getProductPrice() const{ return lbs_price * wght; }
    void scanner(){
      Product::scanner();
      cout << "Weight(lbs): "; cin >> wght;
      cout << "Price/lbs: "; cin >> lbs_price;
      cin.sync(); cin.clear();
    }
    void printer() const{
      Product::printer();
      cout << fixed << setprecision(2)
            << "Price per Lbs: " << lbs_price
            << "\nWeight: " << wght
            << "\nTotal: " << lbs_price * wght
            << endl;
    }
};

void record(){
    // create an array of 100 pointers to Product objects
    Product* products[100];
    int numProducts = 0;
    int choice;
    double total_price = 0.0;
    cout << "PrePackaged Food (1), Fresh Food (2), or Quit (0): "; cin >> choice;
    while (choice != 0){
        if (choice == 1){
            PrepackedFood* p = new PrepackedFood;
            p->scanner();
            products[numProducts] = p;
            numProducts++;
        }
        else if (choice == 2){
            FreshFood* f = new FreshFood;
            f->scanner();
            products[numProducts] = f;
            numProducts++;
        }
        else{
            cout << "Invalid choice" << endl;
        }
        cout << "PrePackaged Food (1), Fresh Food (2), or Quit (0): "; cin >>
choice;
    }
    for (int i = 0; i < numProducts; i++){
        products[i]->printer();
        total_price += products[i]->getProductPrice();
    }
    cout << "Total price: " << total_price << endl;
}

int main(){
    int a;
    a = 1;
    cout << "Welcome to the supermarket!" << endl;
    while (a != 0){
      record();
      cout << "Next customer? (1) or (0): "; cin >> a;
    }
    cout << "Goodbye!" << endl;
    return 0;
}
```

Run program & result:



```
PS D:\VS CODE\C C++\CS360L\Lab9> cd "d:\VS CODE\C C++\CS360L\Lab9\" ;
Welcome to the supermarket!
PrePackaged Food (1), Fresh Food (2), or Quit (0): 1
Enter the barcode: 123456
Enter the name: chips
Price per piece: 5
PrePackaged Food (1), Fresh Food (2), or Quit (0): 2
Enter the barcode: 987654
Enter the name: fish
Weight(lbs): 3
Price/lbs: 4
PrePackaged Food (1), Fresh Food (2), or Quit (0): 0
Barcode: 123456
Name: chips
Price per piece: 5.00
Barcode: 987654
Name: fish
Price per Lbs: 4.00
Weight: 3.00
Total: 12.00
Total price: 17.00
Next customer? (1) or (0): 0
Goodbye!
PS D:\VS CODE\C C++\CS360L\Lab9>
```