

```
1 #include "Product.h"
2 #include "Elect.h"
3 #include "Groc.h"
4 #include "Coths.h"
5
6 void showMenu(int &ch)
7 {
8     cout << "\n1) Display All Products \t 2) Create New Products \n3) Exit" << endl;
9     cin >> ch;
10 }
11
12 int serachProById(int &id, int &noOfProds, Product *ptr[])
13 {
14     int idx = -1;
15     for (int i = 0; i < noOfProds; i++)
16     {
17         if (ptr[i]->getProdId() == id)
18         {
19             return i;
20         }
21     }
22     return idx;
23 }
24
25 bool removeProduct(int &id, int &index, Product *p[])
26 {
27     int idx = serachProById(id, index, p);
28
29     if (idx != -1)
30     {
31         for (int i = idx; i < index - 1; i++)
32         {
33             p[i] = p[i + 1];
34         }
35         index -- 1;
36     }
37     return true;
38 }
```

PS D:\Fullstack-Java-FirstBit-Solutions\Basic-C-and-CPP\End_Module_Test> ./main

1) Display All Products 2) Create New Products
3) Display Final Price of each Product 4) Remove Product
0) Exit
Enter Your Choice : 1

List of all Products..:
Product details are :
Prod ID : 10
Prod Name : Shirt
Prod Price : 145.68
Prod Quantity : 5
Material :linon
Size :M

Product details are :
Prod ID : 10
Prod Name : Mobile
Prod Price : 1300
Prod Quantity : 10
Brand Name :Samsung
Warranty :5yrs.

Product details are :
Prod ID : 123
Prod Name : Sugar
Prod Price : 34.55
Prod Quantity : 69
Expiry Date : 2
Weight :5

1) Display All Products 2) Create New Products
3) Display Final Price of each Product 4) Remove Product
0) Exit
Enter Your Choice : 2

Which Product do you want to add :

```
1 #include "Product.h"
2 #include "Elect.h"
3 #include "Groc.h"
4 #include "Coths.h"
5
6 void showMenu(int &ch)
7 {
8     cout << "\n1) Display All Products \t 2) Create New Products \n3) Exit" << endl;
9     cin >> ch;
10 }
11
12 int serachProById(int &id, int &noOfProds, Product *ptr[])
13 {
14     int idx = -1;
15     for (int i = 0; i < noOfProds; i++)
16     {
17         if (ptr[i]->getProdId() == id)
18         {
19             return i;
20         }
21     }
22     return idx;
23 }
24
25 bool removeProduct(int &id, int &index, Product *p[])
26 {
27     int idx = serachProById(id, index, p);
28
29     if (idx != -1)
30     {
31         for (int i = idx; i < index - 1; i++)
32         {
33             p[i] = p[i + 1];
34         }
35         index -- 1;
36     }
37     return true;
38 }
```

Enter Product Id102
Enter Product NameTrousers
Enter Product Price1200.99
Enter Product Quantity100
Enter Product SizeM
Enter Product MaterialCotton

1) Display All Products 2) Create New Products
3) Display Final Price of each Product 4) Remove Product
0) Exit
Enter Your Choice : 3

List of all Products Final Prices..:Product Final Price : 131.112

Product Final Price : 1170
Product Final Price : 32.8225
Product Final Price : 11700.7
Product Final Price : 1080.89

1) Display All Products 2) Create New Products
3) Display Final Price of each Product 4) Remove Product
0) Exit
Enter Your Choice : 1

List of all Products..:
Product details are :
Prod ID : 10
Prod Name : Shirt
Prod Price : 145.68
Prod Quantity : 5
Material :linon
Size :M

```
1 #include "Product.h"
2 #include "Elect.h"
3 #include "Groc.h"
4 #include "Coths.h"
5
6 void showMenu(int &ch)
7 {
8     cout << "\n1) Display All Products \t 2) Create New Products \n3) Remove Product \n4) Exit\n";
9     cin >> ch;
10 }
11
12 int serachProById(int &id, int &noOfProds, Product *ptr[])
13 {
14     int idx = -1;
15     for (int i = 0; i < noOfProds; i++)
16     {
17         if (ptr[i]->getProdId() == id)
18         {
19             return i;
20         }
21     }
22     return idx;
23 }
24
25 bool removeProduct(int &id, int &index, Product *p[])
26 {
27     int idx = serachProById(id, index, p);
28
29     if (idx != -1)
30     {
31         for (int i = idx; i < index - 1; i++)
32         {
33             p[i] = p[i + 1];
34         }
35         index -- 1;
36     }
37     return true;
38 }
```

Product details are :
Prod ID : 102
Prod Name : Trouser
Prod Price : 1200.99
Prod Quantity : 100
Material : Cotton
Size : M

1) Display All Products 2) Create New Products
3) Display Final Price of each Product 4) Remove Product
0) Exit
Enter Your Choice : 4

Enter the id of product you want to delete..101

Deleted successfully...!

1) Display All Products 2) Create New Products
3) Display Final Price of each Product 4) Remove Product
0) Exit
Enter Your Choice : 1

List of all Products..:
Product details are :
Prod ID : 10
Prod Name : Shirt
Prod Price : 145.68
Prod Quantity : 5
Material : linon
Size : M

Product details are :
Prod ID : 10
Prod Name : Mobile
Prod Price : 1300
Prod Quantity : 10
Brand Name : Samsung
Warranty : Syrs.

```
1 #include "Product.h"
2 #include "Elect.h"
3 #include "Groc.h"
4 #include "Coths.h"
5
6 void showMenu(int &ch)
7 {
8     cout << "\n1) Display All Products \t 2) Create New Products \n3) Remove Product \n4) Exit\n";
9     cin >> ch;
10 }
11
12 int serachProById(int &id, int &noOfProds, Product *ptr[])
13 {
14     int idx = -1;
15     for (int i = 0; i < noOfProds; i++)
16     {
17         if (ptr[i]->getProdId() == id)
18         {
19             return i;
20         }
21     }
22     return idx;
23 }
24
25 bool removeProduct(int &id, int &index, Product *p[])
26 {
27     int idx = serachProById(id, index, p);
28
29     if (idx != -1)
30     {
31         for (int i = idx; i < index - 1; i++)
32         {
33             p[i] = p[i + 1];
34         }
35         index -- 1;
36     }
37     return true;
38 }
```

Product details are :
Prod ID : 123
Prod Name : Sugar
Prod Price : 34.55
Prod Quantity : 69
Expiry Date : 2
Weight : 5

Product details are :
Prod ID : 102
Prod Name : Trouser
Prod Price : 1200.99
Prod Quantity : 100
Material : Cotton
Size : M

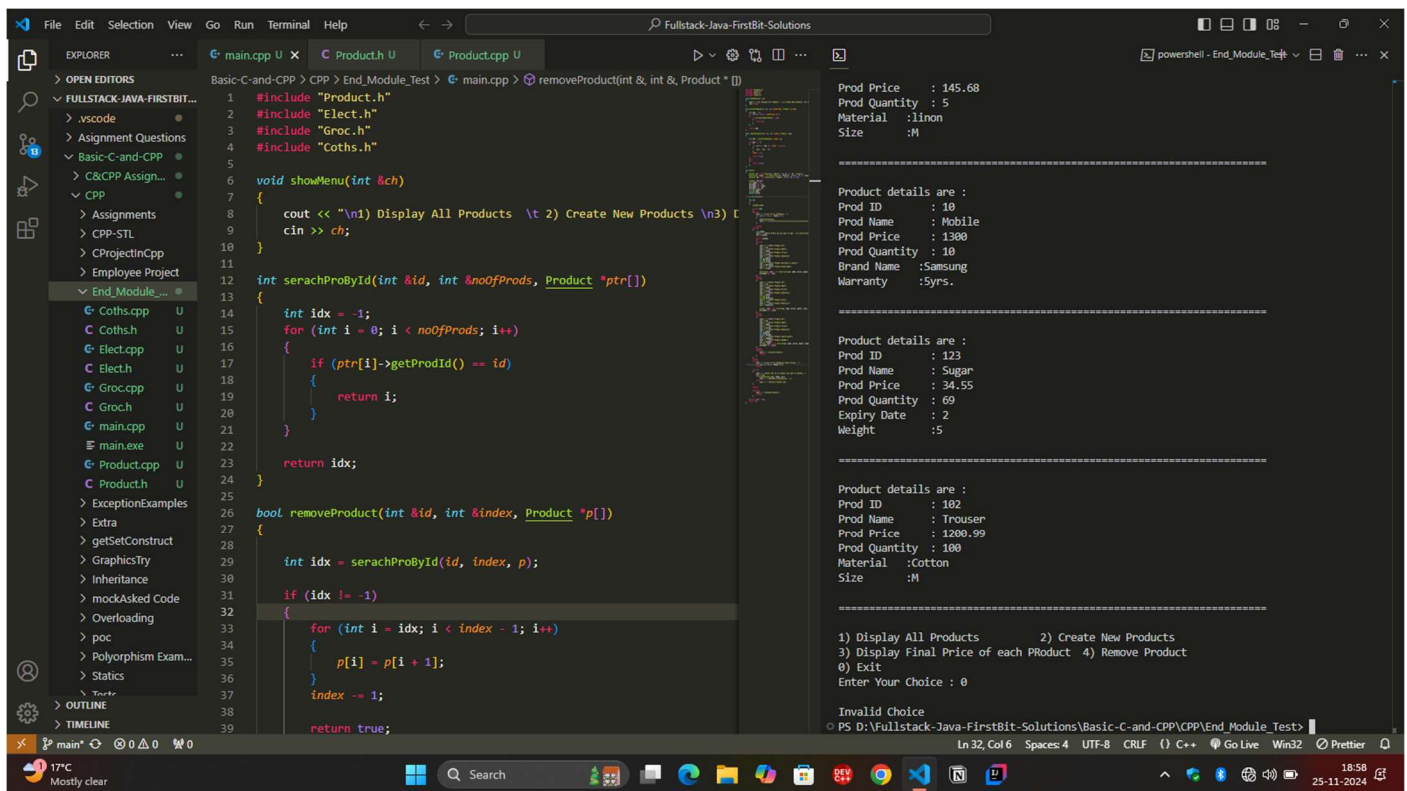
1) Display All Products 2) Create New Products
3) Display Final Price of each Product 4) Remove Product
0) Exit
Enter Your Choice : 4

Enter the id of product you want to delete..8993

Invalid Product Id

1) Display All Products 2) Create New Products
3) Display Final Price of each Product 4) Remove Product
0) Exit
Enter Your Choice : 1

List of all Products..:
Product details are :
Prod ID : 10
Prod Name : Shirt
Prod Price : 145.68
Prod Quantity : 5
Material : linon
Size : M



PS D:\Fullstack-Java-FirstBit-Solutions\Basic-C-and-CPP\CPP\End_Module_Test> ./main

1) Display All Products 2) Create New Products
3) Display Final Price of each PProduct 4) Remove Product
0) Exit
Enter Your Choice : 1

List of all Prodducts...:

Product details are :

Prod ID : 10
Prod Name : Shirt
Prod Price : 145.68
Prod Quantity : 5
Material :linon
Size :M

=====

Product details are :

Prod ID : 10
Prod Name : Mobile
Prod Price : 1300
Prod Quantity : 10
Brand Name :Samsung
Warranty :5yrs.

=====

Product details are :

Prod ID : 123
Prod Name : Sugar
Prod Price : 34.55
Prod Quantity : 69
Expiry Date : 2
Weight :5

=====

1) Display All Products 2) Create New Products
3) Display Final Price of each PProduct 4) Remove Product
0) Exit
Enter Your Choice : 2

Which Product do you want to add :
1) Electronics 2) Cloth 3) Grocery
1

Enter Product Id101

Enter Product NameLaptop

Enter Product Price13000.78

Enter Product Quantity12

Enter Product Warranty in years5

Enter Product Brand nameDell

1) Display All Products 2) Create New Products
3) Display Final Price of each PProduct 4) Remove Product
0) Exit
Enter Your Choice : 2

Which Product do you want to add :
1) Electronics 2) Cloth 3) Grocery
2

Enter Product Id102

Enter Product NameTrouser

Enter Product Price1200.99

Enter Product Quantity100

Enter Product SizeM

Enter Product MaterialCotton

1) Display All Products 2) Create New Products
3) Display Final Price of each PProduct 4) Remove Product

0) Exit
Enter Your Choice : 3

List of all Prodducts Final Prices.:Product Final Price : 131.112

Product Final Price : 1170

Product Final Price : 32.8225

Product Final Price : 11700.7

Product Final Price : 1080.89

1) Display All Products 2) Create New Products
3) Display Final Price of each PProduct 4) Remove Product
0) Exit
Enter Your Choice : 1

List of all Prodducts.:

Product details are :
Prod ID : 10
Prod Name : Shirt
Prod Price : 145.68
Prod Quantity : 5
Material :linon
Size :M

Product details are :
Prod ID : 10
Prod Name : Mobile
Prod Price : 1300
Prod Quantity : 10
Brand Name :Samsung
Warranty :5yrs.

Product details are :
Prod ID : 123
Prod Name : Sugar
Prod Price : 34.55
Prod Quantity : 69
Expiry Date : 2
Weight :5

Product details are :
Prod ID : 101
Prod Name : Laptop

Prod Price : 13000.8
Prod Quantity : 12
Brand Name :Dell
Warranty :5yrs.

Product details are :

Prod ID : 102
Prod Name : Trouser
Prod Price : 1200.99
Prod Quantity : 100
Material :Cotton
Size :M

1) Display All Products 2) Create New Products
3) Display Final Price of each PProduct 4) Remove Product
0) Exit
Enter Your Choice : 4

Enter the id of product you want to delete..101

Deleted successfully...!

1) Display All Products 2) Create New Products
3) Display Final Price of each PProduct 4) Remove Product
0) Exit
Enter Your Choice : 1

List of all Prodducts...:

Product details are :
Prod ID : 10
Prod Name : Shirt
Prod Price : 145.68
Prod Quantity : 5
Material :linon
Size :M

Product details are :

Prod ID : 10
Prod Name : Mobile
Prod Price : 1300
Prod Quantity : 10
Brand Name :Samsung
Warranty :5yrs.

Product details are :

Prod ID : 123

Prod Name : Sugar
Prod Price : 34.55
Prod Quantity : 69
Expiry Date : 2
Weight :5

Product details are :

Prod ID : 102
Prod Name : Trouser
Prod Price : 1200.99
Prod Quantity : 100
Material :Cotton
Size :M

1) Display All Products 2) Create New Products
3) Display Final Price of each PProduct 4) Remove Product
0) Exit
Enter Your Choice : 4

Enter the id of product you want to delete..8993

Invalid Product Id

1) Display All Products 2) Create New Products
3) Display Final Price of each PProduct 4) Remove Product
0) Exit
Enter Your Choice : 1

List of all Prodducts...:

Product details are :
Prod ID : 10
Prod Name : Shirt
Prod Price : 145.68
Prod Quantity : 5
Material :linon
Size :M

Product details are :

Prod ID : 10
Prod Name : Mobile
Prod Price : 1300
Prod Quantity : 10
Brand Name :Samsung
Warranty :5yrs.

Product details are :

Prod ID : 123
Prod Name : Sugar
Prod Price : 34.55
Prod Quantity : 69
Expiry Date : 2
Weight :5

=====

Product details are :

Prod ID : 102
Prod Name : Trouser
Prod Price : 1200.99
Prod Quantity : 100
Material :Cotton
Size :M

=====

1) Display All Products 2) Create New Products
3) Display Final Price of each PProduct 4) Remove Product
0) Exit
Enter Your Choice : 0

Invalid Choice

PS D:\Fullstack-Java-FirstBit-Solutions\Basic-C-and-CPP\CPP\End_Module_Test>

Main.cpp

```
#include "Product.h"
#include "Elect.h"
#include "Groc.h"
#include "Coths.h"

void showMenu(int &ch)
{
    cout << "\n1) Display All Products \t 2) Create New Products \n3) Display Final Price of each PProduct\t4) Remove Product \n0) Exit\nEnter Your Choice : ";
    cin >> ch;
}

int serachProById(int &id, int &noOfProds, Product *ptr[])
{
    int idx = -1;
    for (int i = 0; i < noOfProds; i++)
    {
        if (ptr[i]->getProdId() == id)
        {
            return i;
        }
    }

    return idx;
}

bool removeProduct(int &id, int &index, Product *p[])
{
    int idx = serachProById(id, index, p);

    if (idx != -1)
    {
        for (int i = idx; i < index - 1; i++)
        {
            p[i] = p[i + 1];
        }
        index -= 1;

        return true;
    }
    else
    {
        return false;
    }
}

int main()
{
    Cloths *c1 = new Cloths(10, "Shirt", 145.68, 5, "M", "linon");
```

```

Electronic *ele1 = new Electronic(10, "Mobile", 1300.0, 10, 5, "Samsung");
Grocery *g1 = new Grocery(123, "Sugar", 34.55, 69, 2, 5);

Product *pr[10];
int index = 0;
pr[index++] = c1;
pr[index++] = ele1;
pr[index++] = g1;
int id, quant;
string name;
double price;

// g1.display();
// cout << "Discounted Price : " << g1.calculateDiscountedPrice();
// ele1.display();
// cout << "Discounted Price : " << ele1.calculateDiscountedPrice();
// c1.display();
// cout << "Discounted Price : " << c1.calculateDiscountedPrice();

int ch;
do
{
    showMenu(ch);

    switch (ch)
    {
        case 1:
            cout << "\nList of all Prodducts..:";
            for (int i = 0; i < index; i++)
            {
                pr[i]->display();
                cout <<
"\n\n=====
            }

            break;
        case 2:
        {
            int prodC;
            cout << "\nWhich Prduct do you want to add : \n1) Electronics \t2) Cloth \t 3)
Grocery \n";
            cin >> prodC;

            switch (prodC)
            {
                case 1:
                {
                    cout << "\nEnter Product Id";
                    cin >> id;
                    cout << "\nEnter Product Name";
                    cin >> name;
                    cout << "\nEnter Product Price";
                    cin >> price;

```

```

        cout << "\nEnter Product Quantity";
        cin >> quant;
        int Warranty;
        string brand;
        cout << "\nEnter Product Warranty in years";
        cin >> Warranty;
        cout << "\nEnter Product Brand name";
        cin >> brand;

        Electronic *ele = new Electronic(id, name, price, quant, Warranty, brand);
        pr[index++] = ele;
    }
    break;
    case 2:
    {
        cout << "\nEnter Product Id";
        cin >> id;
        cout << "\nEnter Product Name";
        cin >> name;
        cout << "\nEnter Product Price";
        cin >> price;
        cout << "\nEnter Product Quantity";
        cin >> quant;
        string size;
        string material;
        cout << "\nEnter Product Size";
        cin >> size;
        cout << "\nEnter Product Material";
        cin >> material;

        Cloths *clot = new Cloths(id, name, price, quant, size, material);
        pr[index++] = clot;
    }
    break;
    case 3:
    {
        cout << "\nEnter Product Id";
        cin >> id;
        cout << "\nEnter Product Name";
        cin >> name;
        cout << "\nEnter Product Price";
        cin >> price;
        cout << "\nEnter Product Quantity";
        cin >> quant;
        int expdate;
        double weight;
        cout << "\nEnter Product Expiry Date";
        cin >> expdate;
        cout << "\nEnter Product Weight";
        cin >> weight;
        Grocery *groc = new Grocery(id, name, price, quant, expdate, weight);
        pr[index++] = groc;
    }
}

```

```

        break;
    default:
        cout << "\nInvalid Choice";
        break;
    }
}
break;
case 3:
    cout << "\nList of all Prodducts Final Prices..";
    for (int i = 0; i < index; i++)
    {
        pr[i]->calculateDiscountedPrice();
        cout << "Product Final Price : " << pr[i]->getFPrice();
        cout <<
"\n===== \n";
    }
    break;

case 4:
{
    cout << "\nEnter the id of product you want to delete..";
    cin >> id;
    if (removeProduct(id, index, pr))
        cout << "\nDeleted successfully...!";
    else
        cout << "\nInvalid Product Id";
}

break;

default:
    cout << "\nInvalid Choice";
    break;
}

} while (ch != 0);
return 0;
}

```

Product.h

```
#include <bits/stdc++.h>
using namespace std;
#pragma once
class Product
{
    int prodId;
    string prodName;
    double prodPrice, finalPrice;
    int prodQuantity;

public:
    Product(int, string);
    Product(int, string, double, int);

    void setPrice(double);
    double getPrice();
    void setFPrice(double);
    double getFPrice();
    int getProdId();
    virtual void display();
    virtual double calculateDiscountedPrice()=0;
};
```

Product.cpp

```
#include "Product.h"

Product::Product(int id, string name)
{
    this->prodId = id;
    this->prodName = name;
}

Product::Product(int id, string name, double price, int quant)
{
    this->prodId = id;
    this->prodName = name;
    this->prodPrice = price;
    this->prodQuantity = quant;
}

void Product::setPrice(double price)
{
    this->prodPrice = price;
}

double Product::getPrice()
{
    return this->prodPrice;
}

void Product::setFPrice(double price)
{
    this->finalPrice = price;
}
```

```

}
double Product::getFPrice()
{
    return this->finalPrice;
}
int Product::getProdId()
{
    return this->prodId;
}

void Product::display()
{
    cout << "\nProduct details are :";
    cout << "\nProd ID      : " << this->prodId;
    cout << "\nProd Name     : " << this->prodName;
    cout << "\nProd Price    : " << this->prodPrice;
    cout << "\nProd Quantity : " << this->prodQuantity;
}

```

Elect.h

```

#include "Product.h"

class Electronic :public Product
{
    int warranty;
    string brand;

public:
    Electronic(int, string, double, int, int, string);
    void display();
    // void setName(string);
    // void setWarranty(int);
    // void setBrand(string);
    double calculateDiscountedPrice() override;
    // void setPrice(double);
};

```

Elect.cpp

```

#include "Elect.h"

Electronic::Electronic(int id, string name, double price, int quant, int warranty, string brand) :
Product(id, name, price, quant)
{
    this->brand = brand;
    this->warranty = warranty;
}

void Electronic::display()
{
}

```

```
Product::display();  
cout << "\nBrand Name  :" << this->brand;  
cout << "\nWarranty    :" << this->warranty << "yrs.";  
}  
  
double Electronic::calculateDiscountedPrice()  
{  
    double discount = 0.10;  
    this->setFPrice(this->getPrice() - (this->getPrice() * discount));  
    return this->getFPrice();  
}
```

Groc.h

```
#include "Product.h"

class Grocery : public Product
{
    int expDate;
    double weight;

public:
    Grocery(int, string, double, int, int, double);

    void display();
    double calculateDiscountedPrice() override;
};
```

Groc.cpp

```
#include "Groc.h"

Grocery::Grocery(int id, string name, double price, int quant, int expDate, double weight) : Product(id,
name, price, quant)
{
    this->expDate = expDate;
    this->weight = weight;
}

void Grocery::display()
{
    Product::display();
    cout << "\nExpiry Date    : " << this->expDate;
    cout << "\nWeight          : " << this->weight;
}

double Grocery::calculateDiscountedPrice()
{
    double discount = 0.05;
    this->setFPrice(this->getPrice() - (this->getPrice() * discount));
    return this->getFPrice();
}
```

Coths.h

```
#include "Product.h"

class Cloths : public Product
{
    string size;
```



```

    string material;

public:
    Cloths(int, string, double, int, string, string);

    void display();
    double calculateDiscountedPrice() override;
};

```

Coths.cpp

```

#include "Coths.h"

Cloths::Cloths(int id, string name, double price, int quant, string size, string material) : Product(id,
name, price, quant)
{
    this->material = material;
    this->size = size;
}

void Cloths::display()
{
    Product::display();
    cout << "\nMaterial  :" << this->material;
    cout << "\nSize      :" << this->size;
}

double Cloths::calculateDiscountedPrice()
{
    double discount = 0.10;
    this->setFPrice(this->getPrice() - (this->getPrice() * discount));
    return this->getFPrice();
}

```