```cpp
 1 /********************************************************************
 2  * PROGRAMMER : Ali Eshghi
 3  * STUDENT ID : 1112261
 4  * CLASS      : CS1C
 5  * SECTION    : MW 5pm
 6  * Assign #1  : Deck of cards
 7  * DUE DATE   : 22 January 2020
 8  ********************************************************************/
 9 #ifndef HEADER_H_
10 #define HEADER_H_
11
12
13 //Preprocessor directives
14 #include<iostream>      //For input, output
15 #include<iomanip>       //For style
16 #include<string>     //For using string
17 using namespace std;//using namespace standard
18
19 #define SIZE 5           //defining the constant SIZE = 5
20
21
22 //using #ifndef and #endif to define a structure
23 #ifndef INVENTORY
24 #define INVENTORY
25
26 //definition of inventory structure
27 typedef struct inventory
28 {
29     /**************
30      *  VARIABLES  *
31      **************/
32
33     string  eqpName;  //PROCESS & OUT - storing the name
34     double  price;    //PROCESS & OUT - storing the price
35     int     quantity; //PROCESS & OUT - storing the quantity
36 }inventory;
37
38 #endif
39
40 /***********************************************************
41  * Function - display
42  ***********************************************************
43  * This function just prints out the pointer variable's
44  * value to the screen based on a for loop
45  *
46  * Return type - nothing
47  * void type function
48  ***********************************************************/
49 void display(inventory *inv);
50
51
52 #endif /* HEADER_H_ */
53
```

```cpp
 1 /************************************************************************
 2  * PROGRAMMER : Ali Eshghi
 3  * STUDENT ID : 1112261
 4  * CLASS      : CS1C
 5  * SECTION    : MW 5pm
 6  * Assign #1  : Deck of cards
 7  * DUE DATE   : 22 January 2020
 8  ************************************************************************/
 9
10 #include"Header.h"
11
12 /************************************************************************
13  * Assignment 3
14  * ---------------------------------------------------------------------
15  * This program will get name, price, and quantity of some sport equipments and
16  * using the pointer variable, it stores them and send them to a display function
17  * for output on the screen, then using the struct variables, we calculate that if
18  * a user buys something from store, how many of that item is going to be
19  * available after that and also it calculates that how much the cost is going to
20  * be, before and after tax.
21  * ---------------------------------------------------------------------
22  * INPUT  : Nothing
23  * ---------------------------------------------------------------------
24  * PROCESS: the program calculates Mark's purchas bill for four pairs of Nike
25  *          basketball shoes, five Under Armour T-shirts, six Under Armour shorts
26  *          , and one pair of Asics running shoes, including the total cost
27  *          before and after tax. Assume the tax rate is 7.75%
28  * ---------------------------------------------------------------------
29  * OUTPUT : The progeam will output a recipt of the items that mark purchased,
30  *          and outputs the total price of what mark has purchased before and
31  *          after tax. It also outputs the store inventory before and after
32  *          mark's purchase
33  ************************************************************************/
34 int main()
35 {
36     /***************
37      *  VARIABLES  *
38      ***************/
39
40     inventory *inv = new inventory[SIZE];   //PROCESS - for storing the features
41     double total;                           //PROCESS & OUT - calculating the total
   price
42     double tax;                             //PROCESS & OUT - calculating the tax
43
44     /*******************
45      *  INITIALIZATION  *
46      *******************/
47
48     inv[0].eqpName  = "Nike basketball shoes";
49     inv[0].price    = 179.99;
50     inv[0].quantity = 25;
51
52     inv[1].eqpName  = "Under Armor T-shirt";
53     inv[1].price    = 29.99;
54     inv[1].quantity = 88;
55
56     inv[2].eqpName  = "Brooks running shoes";
57     inv[2].price    = 121.44;
58     inv[2].quantity = 13;
```

```cpp
59
60      inv[3].eqpName  = "Asics running shoes";
61      inv[3].price    = 165.88;
62      inv[3].quantity = 12;
63
64      inv[4].eqpName  = "Under Armor shorts";
65      inv[4].price    = 45.77;
66      inv[4].quantity = 35;
67
68      cout<<"*** Purchase bill *** "                      <<endl;
69      cout<<"Item No. Name of equipment\tCost\tQuantity"  <<endl;
70      cout<<"1. Nike basketball shoes\t$179.99\t\t4 "     <<endl;
71      cout<<"2. Under Armour T-shirt\t\t$29.99\t\t5 "     <<endl;
72      cout<<"3. Under Armour shorts\t\t$45.77\t\t6 "      <<endl;
73      cout<<"4. Asics running shoes\t\t$165.88\t\t1 "     <<endl;
74
75      //calculating total purchase price
76      total = 4 * 179.99 + 5 * 29.99 + 6 * 45.77 + 165.88;
77      cout<<" Total Cost: $"<< total << endl;
78
79      //calculating the tax
80      tax = total * 7.75/100;
81
82      cout << "Tax(7.75%) $" << tax << endl;
83
84      cout <<"Total cost $" << (total + tax) << endl << endl;
85
86      //inventory before the purchase
87      cout << "Inventory before marks purchase:" << endl;
88      display(inv);
89
90      //making some changes in the inventory
91      inv[0].quantity-=4;
92      inv[1].quantity-=5;
93      inv[4].quantity-=6;
94      inv[3].quantity-=1;
95
96      //inventory after the purchase
97      cout << "\n\nInventory after marks purchase:" << endl;
98      display(inv);
99
100     //deleting the pointer variable to prevent memory leak
101     delete []inv;
102
103     return 0;
104
105
106 }
107
```

```cpp
 1 /**************************************************************************
 2  * PROGRAMMER : Ali Eshghi
 3  * STUDENT ID : 1112261
 4  * CLASS       : CS1C
 5  * SECTION     : MW 5pm
 6  * Assign #1   : Deck of cards
 7  * DUE DATE    : 22 January 2020
 8  **************************************************************************/
 9
10 #include"Header.h"
11
12 /*********************************************************
13  * Function - display
14  *********************************************************
15  * This function just prints out the pointer variable's
16  * value to the screen based on a for loop
17  *
18  * Return type - nothing
19  * void type function
20  *********************************************************/
21
22 void display(inventory *inv)
23 {
24     cout << "Name of equipment\tCost\tQuantity" << endl;
25
26     //for loop for printing the items one by one
27     for(int i = 0; i < SIZE; i++)
28     {
29         cout << inv[i].eqpName << "\t";
30         cout << "$" << inv[i].price << "\t";
31         cout << inv[i].quantity << endl;
32     }
33 }
34
35
```

```
 1 *** Purchase bill ***
 2 Item No. Name of equipment  CostQuantity
 3 1. Nike basketball shoes$179.99     4
 4 2. Under Armour T-shirt     $29.99      5
 5 3. Under Armour shorts      $45.77      6
 6 4. Asics running shoes      $165.88     1
 7  Total Cost: $1310.41
 8 Tax(7.75%) $101.557
 9 Total cost $1411.97
10
11 Inventory before marks purchase:
12 Name of equipment       CostQuantity
13 Nike basketball shoes   $179.99 25
14 Under Armor T-shirt     $29.99  88
15 Brooks running shoes$121.44 13
16 Asics running shoes     $165.88 12
17 Under Armor shorts      $45.77  35
18
19
20
21 Inventory after marks purchase:
22 Name of equipment       CostQuantity
23 Nike basketball shoes   $179.99 21
24 Under Armor T-shirt     $29.99  83
25 Brooks running shoes$121.44 13
26 Asics running shoes     $165.88 11
27 Under Armor shorts      $45.77  29
```