```cpp
1
2    #include <iostream>
3    #include <string.h>
4    #include <iomanip>   // To use setprecision() and setw()
5
6    using namespace std;
7
8        float sales[8][6] {0};  // 2D array of sales with sales person as a column and product
     types as a row
9        string salespersons[6] = {"Products","SalesPerson 1","SalesPerson 2","SalesPerson
     3","SalesPerson 4","Product Total"};
10       string products[8] =
     {"Product0","Product1","Product2","Product3","Product4","Product5","Total Sale","Bonus
     (5%)"};
11
12   // Prototypes / Function declaration
13
14   void menu();
15   void slip();
16   bool again();
17   void display();
18   void total();
19   void bonus();
20   void findSP();
21   void findP();
22   void SpRank();
23   void changeN();
24   void changeSPN();
25   void changePN();
26   void devs();
27   inline void cont();
28   inline void clear();
29
30   // Main
31   int main()
32   {
33   // credit@ ASCII ART
34   cout <<" ==============================================================" << endl;
35   cout <<"      _   _   _         _                          _____          " << endl;
36   cout <<" |_|   | |       | |                          |___ \\          " << endl;
37   cout <<" | |   | | ___| |  ___  __   ___  __         | |_/ / ___ ___ ___   " << endl;
38   cout <<" | |/\\| |/ _ \\ |/ __/ _ \\|  '_ ` _ \\ / _ \\    | ___ \\/ _ \\\\/ __/ __| " << endl;
39   cout <<" \\  /\\  /  /  __/ | (_| (_) | | | | | |  __/    | |_/ / (_) \\__ \\__ \\ " << endl;
40   cout <<"  \\/  \\/ \\___|_|\\___\\___/|_| |_| |_|\\___|    \\____/ \\___/|___/___/ " << endl;
41   cout <<" ==============================================================" << endl;
42
43       menu();
44       return 0;
45   }
46
47
48   // Menu
49   void menu(){
50       char choice;
51       cout << endl << endl << endl;
52       cout <<"\tHere are the Options:\n" << endl;
53       cout <<"\tEnter 1 - Add slip" << endl;
54       cout <<"\tEnter 2 - View Summary Table" << endl;
55       cout <<"\tEnter 3 - Find SalesPerson info" << endl;
56       cout <<"\tEnter 4 - Find Product info" << endl;
57       cout <<"\tEnter 5 - SalesPerson LeaderBoard" << endl;
58       cout <<"\tEnter 6 - Change Name" << endl;
59       cout <<"\tEnter 7 - Developers" << endl;
60       cout <<"\tEnter 0 - Exit" << endl;
61       cout <<"\nChoose Options:  " ;
62       cin >> choice;
63       switch(choice){
64           case '1':
65               do{slip();}while(again());
66               break;
67           case '2':
68               display();
69               break;
70           case '3':
71               findSP();
72               break;
73           case '4':
74               findP();
75               break;
76           case '5':
77               SpRank();
78               break;
79           case '6':
80               changeN();
```

```cpp
 81                break;
 82            case '7':
 83                devs();
 84                break;
 85            case '0':
 86                cout <<endl << "\tGood Bye :) " << endl;
 87                exit(0);
 88                break;
 89            default:
 90                cout << "Invalid Choice" << endl << endl;
 91                break;
 92        }
 93
 94        cont();
 95        clear();
 96        menu();
 97    }
 98
 99    // Add daily salesperson slip
100    void slip(){
101        clear();
102        int snum, pnum;
103        float pvalue;
104        cout << endl << endl << "\t Add Slip Data\n" << endl;
105        cout << "\tEnter salesperson number[1-4]: " ;
106        cin >> snum;
107        cout << "\tEnter product number[1-5]: " ;
108        cin >> pnum;
109        cout << "\tHow much money sold: " ;
110        cin >> pvalue;
111        sales[pnum][snum] += pvalue;
112
113        if (snum < 5 && pnum < 6 && snum > 0 && pnum > 0 )
114            cout << endl <<"\tSlip data added Successfully!" << endl;
115        else
116            cout << endl <<"\tInvalid input. Slip Adding failed..." << endl;
117    }
118
119    // Ask if user wants to add another slip Again
120    bool again(){
121        bool again = false;
122        char x;
123        cout << endl << "\tWanna add again? Y/N : ";
124        cin >> x;
125        switch(x){
126            case 'Y':
127            case 'y':
128                again = true;
129                break;
130            case 'N':
131            case 'n':
132            default:
133                again = false;
134        }
135        clear();
136        return again;
137    }
138
139    // calculate Total sales values
140    void total(){
141        // row total
142        for(int i=1;i<6;i++){
143                sales[i][5] = 0;
144            for ( int j =1; j<5; j++){
145                sales[i][5] += sales[i][j];
146            }
147        }
148        // column total
149        for(int i=1;i<6;i++){
150                sales[6][i] = 0;
151            for ( int j =1; j<6; j++){
152                sales[6][i] += sales[j][i];
153            }
154        }
155    }
156    // Calculate 5% Bonus of each salesperson
157    void bonus(){
158        for(int i=1;i<6;i++){
159            sales[7][i] = (0.05) * sales[6][i];    // Bonus = 5% of Total sale
160        }
161    }
162
163    // Display Table
164    void display(){
```

```cpp
165        clear();
166        total();
167        bonus();
168
169        cout << endl << endl << endl << "\t";
170        cout <<
      "---------------------------------------------------------------------------------
      ----------" << endl<< "\t";
171        for(int i=0; i<6; i++)
172            cout << left << setw(15) << salespersons[i]<< "| ";
173        cout << endl<< "\t";
174        cout <<
      "---------------------------------------------------------------------------------
      ----------" << endl << "\t";
175
176        for(int i=1; i<8; i++){
177            cout  << fixed << setprecision(2) << left << setw(15) << products[i]<< "| ";
178            for (int j=1; j<6; j++){
179                cout << setw(15) << sales[i][j] << "| ";
180            }
181            cout << endl << "\t";
182            if(i==5)
183                cout <<
      "---------------------------------------------------------------------------------
      ----------" << endl<< "\t";
184        }
185        cout <<
      "---------------------------------------------------------------------------------
      ----------" << endl<< "\t";
186        cout << endl<< "\t";
187    }
188
189    // clear screen for a better view
190    inline void clear(){
191        system("CLS");
192    }
193
194    // Go to menu
195    inline void cont(){
196        string n;
197        cout << endl << "Press Enter to continue: ";
198        cin.ignore();
199        getchar();
200    }
201
202    // Search for specific salesperson information
203    void findSP(){
204        int spnum, total=0;
205        cout << endl << endl << endl;
206        cout << "\tEnter Sales person number: ";
207        cin >> spnum;
208
209        if (spnum >0 && spnum < 5){
210            clear();
211            cout << endl << endl;
212            cout << "\n\tSales Person " << spnum << " sale information: "<< endl <<endl;
213            for (int i=1;i<6;i++){
214                cout << "\tProduct "<< i <<" sale:\t"<< sales[i][spnum] << " Birr"<< endl;
215                total += sales[i][spnum];
216            }
217            cout << "\t--------------------------------" << endl;
218            cout << "\tTotal sale: \t" << sales[6][spnum] << " Birr" << endl << endl;
219            cout << "\tBonus (5%): \t" << sales[7][spnum] << " Birr" << endl << endl;
220        }
221        else
222            cout << "\tInvalid Input." <<  endl;
223    }
224
225    // Search for specific product information
226    void findP(){
227        int pnum, total=0;
228        cout << endl << endl << endl;
229        cout << "\tEnter Product number: ";
230        cin >> pnum;
231        if (pnum >0 && pnum < 6){
232            clear();
233            cout << endl << endl;
234            cout << "\n\tProduct " << pnum <<" sales information:" << endl << endl;
235            for (int i=1;i<5;i++){
236                cout << "\tSale by Salesperson "<< i <<":\t"<< sales[pnum][i] << " Birr"<< endl;
237                total += sales[pnum][i];
238            }
239            cout << "\t--------------------------------" << endl;
240            cout << "\tTotal sale of the Product: " << sales[pnum][5] << " Birr" << endl <<
```

```cpp
                endl;
241          }
242         else
243             cout << "\tInvalid Input." <<  endl;
244     }
245
246     // Rank of salespersons / leader board
247     void SpRank(){
248         total();
249         clear();
250         float Top[5];
251         string Rank[5];
252
253         for(int i=1;i<5;i++){
254             Top[i]= sales[6][i];
255             Rank[i]= salespersons[i];
256         }
257         for(int i=1;i<5;i++){
258             for(int j=1;j<5;j++){
259                 if (Top[i]> Top[j]){
260                     swap(Top[i], Top[j]);
261                     swap(Rank[i], Rank[j]);
262         }}}
263         cout << endl << endl << endl;
264         cout << "\t\tLEADERBOARD"<< endl;
265         cout << "\tRank" << "\t" << "\t\tTotal Sale" << endl;
266         cout << "\t------------------------------\n";
267         for(int i=1;i<5;i++){
268             cout << "\t"<< i << "\t" << Rank[i] << "\t";
269             cout << fixed << setprecision(2) << Top[i]<< " Birr" <<endl;
270         }
271     }
272
273     // Group Members ( Developers) Name and ID No
274     void devs(){
275         clear();
276         string memebers[][2] = {{"Birhanu Worku", "ETS 0279/13"},{"Biruk Mesfin","ETS
    0290/13"},{"Bisrat Kebere","ETS 0306/13"},{"Biyaol Mesay","ETS 0309/13"},{"Dagim
    Tezerawork","ETS 0333/13"}};
277         cout << endl;
278         cout << setw(8) << "  " << left << setw(3) << "No" << setw(20) << "Name" << setw(25)
    << "ID" << endl;
279         cout << setw(8) << "  " << setw(3) << "--" << setw(20) << "----------" << setw(25) <<
    "-----------" << endl;
280
281         for (int i = 0; i < 5; i++){
282             cout << setw(8) << "  " << setw(3) << i + 1 << setw(20) << memebers[i][0] <<
    setw(25) << memebers[i][1] << endl;
283         }
284         cout << endl;
285     }
286
287     // Manu to change Change Product and Salesperson Names
288     void changeN(){
289         clear();
290         char type;
291         cout << endl << endl << endl;
292         cout <<"\tHere are the Options" << endl;
293         cout << "\tEnter 1 - Set / Change SalesPerson name"<< endl;
294         cout << "\tEnter 2 - Set / Change Product name"<< endl;
295         cout << "\tEnter 3 - Back to Menu" << endl;
296         cout <<"\nChoose Options:  " ;
297         cin >> type;
298
299         switch(type){
300             case '1':
301                 changeSPN();
302                 break;
303             case '2':
304                 changePN();
305                 break;
306             default:
307                 break;
308         }
309     }
310
311     // Change Sales person name
312     void changeSPN(){
313         int spnum;
314         cout << "Enter sales person number[1-4]: ";
315         cin >> spnum;
316
317         if(spnum > 0 && spnum < 5){
318             cout << endl << endl<<"Current name: " << salespersons[spnum] << endl;
```

```cpp
319            cout << "Enter new name: ";
320            cin >> salespersons[spnum];
321            cout << "Name Successfully changed!" << endl;
322        }
323        else
324            cout << "Invalid salesperson number. You should enter [1-4]."<< endl;
325    }
326    // Change Product name
327    void changePN(){
328        int pnum;
329        cout << "Enter product number[1-5] ";
330        cin >> pnum;
331
332        if(pnum > 0 && pnum < 6){
333            cout << endl << endl<<"Current name: " << products[pnum] << endl;
334            cout << "Enter new name: ";
335            cin >> salespersons[pnum];
336            cout << "Name Successfully changed!" << endl;
337        }
338        else
339            cout << "Invalid product number. You should enter [1-5]."<< endl;
340    }
341
342    // Instructor: Eleni T.
343    // Submission date: April 25, 2022.
344    // 2022 @ AASTU Dept. of Software Engineering Section A.
345
```