```cpp
1    #include <iostream>
2    #include <string.h>
3    #include <iomanip>   // To use setprecision() and setw()
4
5    using namespace std;
6
7        float sales[8][6] {0};  // 2D array of sales with sales person as a column and product
     types as a row
8        string salespersons[6] = {"Products","SalesPerson 1","SalesPerson 2","SalesPerson
     3","SalesPerson 4","Product Total"};
9        string products[8] =
     {"Product0","Product1","Product2","Product3","Product4","Product5","Total Sale","Bonus
     (5%)"};
10
11   // Prototypes / Function declaration
12   void menu();
13   void slip();
14   bool again();
15   void display();
16   void total();
17   void bonus();
18   void findSP();
19   void findP();
20   void SpRank();
21   void changeN();
22   void changeSPN();
23   void changePN();
24   void devs();
25   inline void cont();
26   inline void clear();
27
28   // Main
29   int main(){
30   // credit@ ASCII ART
31   cout <<" ================================================================" << endl;
32   cout <<"   _     _    _     _                              _____  \\     " << endl;
33   cout <<"  | |   | |  | |   | |                            |  ___ \\\\    " << endl;
34   cout <<"  | |   | |  | |   | |                            | |_/ / ___  ___    " << endl;
35   cout <<"  | |/\\\\| |/ _ \\ |/ __/ _  \\\\| '_ `  _ \\\\/ _  \\    | ___ \\\\/ _ \\\\/ __/ __| " << endl;
36   cout <<"  \\\\  /\\\\  /  __/ | (_| () | | | | | |  __/    | |_/ / (_) \\\\__ \\\\__ \\\\ " << endl;
37   cout <<"   \\\\/  \\\\/ \\\\___|_|\\\\___\\\\___/|_| |_| |_|\\\\___|    \\\\____/ \\\\___/|___/___/ " << endl;
38   cout <<" ================================================================" << endl;
39
40       menu();
41       return 0;
42   }
43
44   // Menu
45   void menu(){
46       char choice;
47       cout << endl <<"\t\tMAIN MENU" << endl<< endl;
48       cout <<"\tHere are the Options:\n" << endl;
49       cout <<"\tEnter 1 - Add slip" << endl;
50       cout <<"\tEnter 2 - View Summary Table" << endl;
51       cout <<"\tEnter 3 - Find specific SalesPerson info" << endl;
52       cout <<"\tEnter 4 - Find specific Product info" << endl;
53       cout <<"\tEnter 5 - Salespersons LeaderBoard" << endl;
54       cout <<"\tEnter 6 - Change Name" << endl;
55       cout <<"\tEnter 7 - Developers" << endl;
56       cout <<"\tEnter 0 - Exit" << endl;
57       cout <<"\nChoose Options:  " ;
58       cin >> choice;
59       switch(choice){
60           case '1':
61               do{slip();}while(again());
62               break;
63           case '2':
64               display();
65               break;
66           case '3':
67               findSP();
68               break;
69           case '4':
70               findP();
71               break;
72           case '5':
73               SpRank();
74               break;
75           case '6':
76               changeN();
77               break;
78           case '7':
79               devs();
80               break;
```

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

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

```cpp
240    }
241    // Rank of salespersons / leader board
242    void SpRank(){
243        total();
244        clear();
245        float Top[5];
246        string Rank[5];
247
248        for(int i=1;i<5;i++){   // copy
249            Top[i]= sales[6][i];
250            Rank[i]= salespersons[i];
251        }
252        for(int i=1;i<5;i++){   //sort
253            for(int j=1;j<5;j++){
254                if (Top[i]> Top[j]){
255                    swap(Top[i], Top[j]);
256                    swap(Rank[i], Rank[j]);
257        }}}
258        cout << endl << endl << endl;
259        cout << "\t\tLEADERBOARD\n"<< endl;
260        cout << "\tRank" << "\t" << "\t\tTotal Sale" << endl;
261        cout << "\t--------------------------------\n";
262        for(int i=1;i<5;i++){
263            cout << "\t"<< i << "\t" << left << setw(15)<< Rank[i] << "\t";
264            cout << fixed << setprecision(2) << Top[i]<< " birr" <<endl;
265        }
266    }
267    // Group Members ( Developers) Name and ID No.
268    void devs(){
269        clear();
270        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"}};
271        cout << endl << endl;
272        cout << "\t   ADDIS ABABA SCIENCE AND TECHNOLOGY UNIVERSITY\n";
273        cout << "\t COLLEGE OF ELECTRICAL AND MECHANICAL ENGINEERING\n";
274        cout << "\t\tDEPARTMENT OF SOFTWARE ENGINEERTING\n";
275        cout << "\t\t\t\tSECTION A\n" << endl << endl;
276
277        cout << "\t\t" << left << setw(3) << "No" << setw(20) << "Name" << setw(25) << "ID"
       << endl;
278        cout << "\t\t" << setw(3) << "--" << setw(20) << "----------" << setw(25) <<
       "------------" << endl;
279
280        for (int i = 0; i < 5; i++){
281            cout << "\t\t" << setw(3) << i + 1 << setw(20) << memebers[i][0] << setw(25) <<
       memebers[i][1] << endl;
282        }
283        cout << endl << "\tInstructor: Eleni T." << endl << "\tSubmitted on: 25th April,
       2022"<< endl;
284    }
285    // Menu to change Change Product and Salesperson Names
286    void changeN(){
287        clear();
288    fail:
289        char type;
290        cout << endl << "\t\tCHANGE NAME" << endl << endl;
291        cout << "\tHere are the Options\n" << endl;
292        cout << "\tEnter 1 - Set / Change SalesPerson name"<< endl;
293        cout << "\tEnter 2 - Set / Change Product name"<< endl;
294        cout << "\tEnter 3 - Back to Menu" << endl;
295        cout << "\nChoose Options:  ";
296        cin >> type;
297
298        switch(type){
299            case '1':
300                changeSPN();
301                break;
302            case '2':
303                changePN();
304                break;
305            case '3':
306                break;
307            default:
308                clear();
309                cout << "\n\nInvalid input. Try Again." << endl;
310                goto fail;
311                break;
312        }
313        if(type!='3')
314            cont();
315    }
316    // Change Sales person name
317    void changeSPN(){
```

```
318        int spnum;
319        cout << "Enter sales person number[1-4]: ";
320        cin >> spnum;
321
322        if(spnum > 0 && spnum < 5){
323            cout << endl << endl<<"Current name: " << salespersons[spnum] << endl;
324            cout << "Enter new name: ";
325            cin >> salespersons[spnum];
326            cout << "Name Successfully changed!" << endl;
327        }
328        else
329            cout << "Invalid salesperson number. You should enter [1-4]."<< endl;
330    }
331    // Change Product name
332    void changePN(){
333        int pnum;
334        cout << "Enter product number[1-5]: ";
335        cin >> pnum;
336
337        if(pnum > 0 && pnum < 6){
338            cout << endl << endl<<"Current name: " << products[pnum] << endl;
339            cout << "Enter new name: ";
340            cin >> products[pnum];
341            cout << "Name Successfully changed!" << endl;
342        }
343        else
344            cout << "Invalid product number. You should enter [1-5]."<< endl;
345    }
346
347    // Instructor: Eleni T.
348    // Submission date: April 25, 2022.
349    // 2022 @ AASTU. Department of Software Engineering. Section A.
350
```