

~\OneDrive\Desktop\p2.cpp

```
1  #include<iostream>
2  using namespace std;
3  int main(){
4      //1
5      int n;
6      cout<<"enter the number of rows:"<<endl;
7      cin>>n;
8      for(int i=1;i<=n;i++){
9          for(int j=1;j<=i;j++){
10             cout<<"*";
11         }
12         for(int j=1;j<=2*(n-i);j++){
13             cout<<" ";
14         }
15         for(int j=1;j<=i;j++){
16             cout<<"*";
17         }
18         cout<<endl;
19     }
20     for(int i=n;i>=1;i--){
21         for(int j=1;j<=i;j++){
22             cout<<"*";
23         }
24         for(int j=1;j<=2*(n-i);j++){
25             cout<<" ";
26         }
27         for(int j=1;j<=i;j++){
28             cout<<"*";
29         }
30         cout<<endl;
31     }
32     //1D ARRAY
33     //2
34     int a;
35     cout<<"enter the number of elements in an array:"<<endl;
36     cin>>a;
37     int arr[a];
38     for(int i=0;i<a;i++){
39         cout<<"enter element at "<<i+1<<endl;
40         cin>>arr[i];
41     }
42     int temp[a];
43     for(int i=0;i<a;i++){
44         temp[i]=arr[a-i-1];
45     }
46     for(int i=0;i<a;i++){
47         cout<<temp[i]<<" ";
48     }
```

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49 //3
50 int max,min;
51 max=arr[0];
52 min=arr[0];
53 for(int i=0;i<a,a;i++){
54     if(max<arr[i]){
55         max=arr[i];
56     }
57 }
58 for(int i=0;i<a,a;i++){
59     if(min>arr[i]){
60         min=arr[i];
61     }
62 }
63 cout<<"max:"<<max<<endl;
64 cout<<"min:"<<min<<endl;
65 //4
66 int sum=0;
67 for(int i=0;i<a,a;i++){
68     sum+=arr[i];
69 }
70 cout<<"sum:"<<sum<<endl;
71 cout<<"avg:"<<sum/a;
72 //5
73 int b;
74 for(int i=0;i<a;i++){
75     for(int j=i+1;j<a;j++){
76         if(arr[i]>arr[j]){
77             b=arr[i];
78             arr[i]=arr[j];
79             arr[j]=b;
80         }
81     }
82 }
83 cout<<"sorted array will be:";
84 for(int i=0;i<a;i++){
85     cout<<arr[i]<<" ";
86 }
87 //6
88 int t,f=0,l;
89 cout<<"enter element to find:"<<endl;
90 cin>>t;
91 for(int i=0;i<a;i++){
92     if(arr[i]==t){
93         l=i;
94         f=1;
95     }
96 }
97 if(f==1){
98     cout<<"target element is at:"<<l<<" index"<<endl;
```

```
99     }
100     else{
101         cout<<"elment not found"<<endl;
102     }
103     //8
104     int d=1;
105     for(int i=0;i<a;i++){
106         if(arr[i]==(min+1)){
107             d++;
108             min+=1;
109         }
110     }
111     cout<<d<<endl;
112     //2D ARRAYS
113     //9
114     int n;
115     cout<<"enter the order of matrix:"<<endl;
116     cin>>n;
117     int mat[n][n],trans[n][n];
118     for(int i=0;i<n;i++){
119         for(int j=0;j<n;j++){
120             cout<<"enter element at "<<i+1<<j+1<<endl;
121             cin>>mat[i][j];
122         }
123     }
124     for(int i=0;i<n;i++){
125         for(int j=0;j<n;j++){
126             trans[j][i]=mat[i][j];
127         }
128     }
129     for(int i=0;i<n;i++){
130         for(int j=0;j<n;j++){
131             cout<<trans[i][j]<<" ";
132         }
133         cout<<endl;
134     }
135     //10
136     int m, n, p;
137     cout << "Enter the number of rows for matrix 1: ";
138     cin >> m;
139     cout << "Enter the number of columns for matrix 1 (and rows for matrix 2): ";
140     cin >> n;
141     cout << "Enter the number of columns for matrix 2: ";
142     cin >> p;
143     int mat1[m][n], mat2[n][p], mmat[m][p];
144     cout << "Enter elements of matrix 1:" << endl;
145     for (int i = 0; i < m; i++) {
146         for (int j = 0; j < n; j++) {
147             cout << "Enter element at position " << i + 1 << ", " << j + 1 << ": ";
148             cin >> mat1[i][j];
```

```
149     }
150 }
151 cout << "Enter elements of matrix 2:" << endl;
152 for (int i = 0; i < n; i++) {
153     for (int j = 0; j < p; j++) {
154         cout << "Enter element at position " << i + 1 << ", " << j + 1 << ": ";
155         cin >> mat2[i][j];
156     }
157 }
158 for (int i = 0; i < m; i++) {
159     for (int j = 0; j < p; j++) {
160         mmat[i][j] = 0;
161         for (int k = 0; k < n; k++) {
162             mmat[i][j] += mat1[i][k] * mat2[k][j];
163         }
164     }
165 }
166 cout << "Resultant Matrix (Matrix multiplication):" << endl;
167 for (int i = 0; i < m; i++) {
168     for (int j = 0; j < p; j++) {
169         cout << mmat[i][j] << " ";
170     }
171     cout << endl;
172 }
173 //11
174 int n,sum=0;
175 cout<<"enter the order of matrix:"<<endl;
176 cin>>n;
177 int mat[n][n];
178 for(int i=0;i<n;i++){
179     for(int j=0;j<n;j++){
180         cout<<"enter element at "<<i+1<<j+1<<endl;
181         cin>>mat[i][j];
182     }
183 }
184 for(int i=0;i<n;i++){
185     sum+=mat[i][i];
186 }
187 cout<<sum;
188 //12
189 int arr[n];
190 for(int i=0;i<n;i++){
191     for(int j=0;j<n;j++){
192         arr[i]+=mat[i][j];
193     }
194 }
195 int max=arr[0],t=0;
196 for(int i=0;i<n;i++){
197     if(max<arr[i]){
198         max=arr[i];
```

```
199         t=i;
200     }
201 }
202 cout<<t<<endl;
203 //13
204 int mat[n][n];
205 for(int i=0;i<n;i++){
206     for(int j=0;j<n;j++){
207         cout<<"enter element at "<<i+1<<j+1<<endl;
208         cin>>mat[i][j];
209     }
210 }
211 int target,flag=0,x=0,y=0;
212 cout<<"enter target"<<endl;
213 cin>>target;
214 for(int i=0;i<n;i++){
215     for(int j=0;j<n;j++){
216         if(mat[i][j]==target){
217             flag=1;
218             x=i;y=j;
219         }
220     }
221 }
222 if(flag==1){
223     cout<<"element found at:"<<x<<y<<endl;
224 }
225 else{
226     cout<<"no element";
227 }
228 //14
229 int n;
230 cin>>n;
231 int mat[n][n];
232 for(int i=0;i<n;i++){
233     for(int j=0;j<n;j++){
234         cout<<"enter element at "<<i+1<<j+1<<endl;
235         cin>>mat[i][j];
236     }
237 }
238 for(int i=0;i<n;i++){
239     for(int j=0;j<n;j++){
240         cout<<mat[0][j];
241     }
242 }
243 cout<<endl;
244 for(int i=0;i<n;i++){
245     cout<<mat[i][0];
246 }
247 cout<<endl;
248 for(int i=0;i<n;i++){
```

```
249     cout<<mat[i][n-1];
250 }
251 cout<<endl;
252 for(int i=0;i<n;i++){
253     cout<<mat[n-1][i];
254 }
255 cout<<endl;
256 //15
257 int x,y; cout<<"Enter dimensions: "; cin>>x>>y;
258 int a[x][y];
259 cout<<"Enter elements: "<<endl;
260 for(int i=0;i<x;i++){
261     for(int j=0;j<y;j++){
262         cin>>a[i][j];
263     }
264 }
265 for(int i=0;i<x;i++){
266     for(int j=0;j<y;j++){
267         cout<<a[i][j]<<" ";
268     }
269     cout<<endl;
270 }
271 bool row,col;
272 for(int i=0;i<x;i++){
273     for(int j=0;j<y;j++){
274         for(int m=0;m<y;m++){
275             if(a[i][j]<=a[i][m])
276                 row=true;
277             else{
278                 row=false;
279                 break;
280             }
281         }
282         for(int m=0;m<x;m++){
283             if(a[i][j]>=a[m][j])
284                 col=true;
285             else{
286                 col=false;
287                 break;
288             }
289         }
290         if(row==true && col==true){
291             cout<<"Saddle point "<<a[i][j]<<endl;
292         }
293     }
294 }
295 }
296 }
297
298
```