**IM/2019/094**

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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **0** | **1** | **2** | **3** | **4** |
| **0** | 0,0 | 0,1 | 0,2 | 0,3 | 0,4 |
| **1** | 1,0 | 1,1 | 1,2 | 1,3 | 1,4 |

**1. Consider a 2-by-5 integer array t.**

**a) Write a definition for t.**

t is a 2D array of integer type. It has 10 separate memory locations in the structure of 2 rows and 5 columns which can store only integer literals.

**b) How many rows does t have?**

2

**c) How many columns does t have?**

5

**d) How many elements does t have?**

10

**e) Write the names of all the elements in the second row of t.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [1,0] | [1,1] | [1,2] | [1,3] | [1,4] |

**f) Write the names of all the elements in the third column of t.**

|  |
| --- |
| [0,2] |
| [1,2] |

**g) Write a single statement that sets the element of t in row 1 and column 2 to zero.**

t[0][1]=0;

**h) Write a nested for statement that initializes each element of t to zero.**

#include<iostream>

using namespace std;

int main(){

int t[2][5];

for(int i=0; i<2; i++){

for(int j=0; j<5; j++){

t[i][j]=0;

}

}

Return 0;

}

**i) Write a statement that inputs the values for the elements of t from the terminal**

#include<iostream>

using namespace std;

int main(){

int t[2][5], x;

for(int i=0; i<2; i++){

for(int j=0; j<5; j++){

cout << " Input value to "<<i <<","<<j << ":- ";

cin >> x;

t[i][j]=x;

}

}

return 0;

}

**j) Write a series of statements that determine and print the smallest value in t.**

#include<iostream>

using namespace std;

int main(){

int t[2][5], x, min;

for(int i=0; i<2; i++){

for(int j=0; j<5; j++){

cout << " Input value to "<<i <<","<<j << ":- ";

cin >> x;

if(i==0 && j==0){

min=x;

}

t[i][j]=x;

if(min<x){

min=x;

}

}

}

cout << "smallest number is "<<min<<endl;

return 0;

}

**k) Write a statement that displays the elements of the first row of t.**

#include<iostream>

using namespace std;

int main(){

int t[2][5], x;

for(int i=0; i<2; i++){

for(int j=0; j<5; j++){

cout << " Input value to "<<i <<","<<j << ":- ";

cin >> x;

t[i][j]=x;

}

}

cout << "\n";

for(int i=0; i<2; i++){

cout << "\n";

for(int j=0; j<5; j++){

cout << " "<< t[i][j] ;

}

}

return 0;

}

**l) Write a statement that totals the elements of the fourth column of t.**

#include<iostream>

using namespace std;

int main(){

int t[2][5], x, sum;

for(int i=0; i<2; i++){

for(int j=0; j<5; j++){

cout << " Input value to "<<i <<","<<j << ":- ";

cin >> x;

t[i][j]=x;

}

}

cout << "\n";

for(int i=0; i<2; i++){

cout << "\n";

for(int j=3; j<4; j++){

sum = sum + t[i][j];

}

}

cout<<"Total is "<< sum<<endl;

return 0;

}

**m) Write a series of statements that print the array t in tabular format. List the column subscripts as headings across the top and list the row subscripts at the left of each row.**

#include<iostream>

#include <iomanip>

using namespace std;

int main(){

int t[2][5], x;

for(int i=0; i<2; i++){

for(int j=0; j<5; j++){

cout << " Input value to "<<i <<","<<j << ":- ";

cin >> x;

t[i][j]=x;

}

}

cout <<"\n";

cout << setw(12) << "col 0" << setw(7)<< "col 1" << setw(7)<< "col 2" << setw(7)<< "col 3" << setw(7)<< "col 4" << endl;

for(int i=0; i<2; i++){

cout << "Row "<<i;

for(int j=0; j<5; j++){

cout << setw(7)<< t[i][j] ;

}

cout << endl;

}

return 0;

}

**2. You are to write a program to assign seats on each flight of the airline's only plane (capacity: 10 seats).**

#include <iostream>

#include <cstring>

using namespace std;

int checking(int choice,int t[2][5]){

int tot=0;

for(int i=0; i<5; i++){

tot=tot+t[choice-1][i];

}

return(tot);

}

int booking(int choice,int t[2][5],const char \*classname[2]){

int i=0;

for(i=0; i<5; i++){

if(t[choice-1][i]==0){

t[choice-1][i]=1;

break;

}

}

cout<<"\n\nSeat No : "<<i+1<<" In "<<classname[choice-1]<<" is Successfully Reserved For You. Thank You!!"<<endl;

cout<<"\n\n\n\n================================="<<endl;

cout<<"Next Customer"<<endl;

cout<<"\nNo Seates are Available. Sorry!!";

}

int main() {

int choice;

int t[2][5]={0,0,0,0,0,0,0,0,0,0};

int reserve;

int tot;

const char \*classname[2]={"1st Class","Economy Class"};

int a;

while(true){

cout<<"Welcome To Airline Seat Reserving System\n========================================\n";

cout<<"Which class you want to reserve?\n\nPress 1 for 1st Class seats:\nPress 2 for Economy seats:"<<endl;

cin>>choice;

if(choice==1){

reserve=1;

}

else if(choice==2){

reserve=0;

}

else{

cout<<"\nInvalid Input. Try Again";

continue;

}

int check = checking(choice,t);

if (check<5){

booking(choice,t,classname);

}

else{

cout<<"\nThere are no available seats in "<<classname[choice-1]<<". Are you conforable with "<<classname[reserve]<<" ?\n[Press 1 to Yes \t Press 0 to No]\n";

cin>>a;

if(a==1){

if(choice==2){

choice=1;

}

else{

choice=2;

}

if(choice==2 and checking(2,t)<5){

booking(choice,t,classname);

}

else if(choice==1 and checking(1,t)<5){

booking(choice,t,classname);

}

else{

cout<<"\n Sorry!! Seates are not available.\n";

cout<<"Next flight Leaves in three hours\n";

cout<<"==================================";

break;

}

}

if(a==0){

cout<<"Sorry!! Next flight Leaves in three hours\n"<<endl;

cout<<"";

}

}

}

return 0;

}

**3. Write a program that inputs a line of text into char array s[ 100 ]. Output the line in uppercase letters and in lowercase letters.**

**#include<stdio.h>**

#include<iostream>

#include<string.h>

using namespace std;

int main() {

char s[100];

cout <<"Enter String less than 100 characters : ";

gets(s);

cout<<"Lowercase : "<< strlwr(s);

cout << "\n";

cout<<"Uppercase : " << strupr(s);

return 0;

}

**4. Write a program that uses function strcmp to compare two strings input by the user. The program should state whether the first string is less than, equal to or greater than the second string.**

#include<stdio.h>

#include<string.h>

#include<iostream>

using namespace std;

int main()

{

char a[100], b[100];

cout<<"Enter the first string :";

gets(a);

cout<<"Enter the second string :";

gets(b);

cout<<"\n";

if( strcmp(a,b) == 0 ){

cout <<"Entered strings are equal.\n";}

if( strcmp(a,b) > 0 ){

cout <<"First one is lager than sceond one.\n";}

if( strcmp(a,b) < 0 ){

cout <<"second one is lager than first one.\n";}

return 0;

}

**5. Write a program that inputs several lines of text and uses strtok to count the total number of words. Assume that the words are separated either by spaces or newline characters.**

#include <iostream>

#include <cstring>

using namespace std;

int main() {

char string[100], \*token;

int count = 0;

cout << "Enter a string\n";

cin.getline(string, 100);

token = strtok(string, " ");

while(NULL != token)

{

count++;

token = strtok(NULL, " ");

}

cout << "Word Count : "<<count;

return 0;

}

**6. You are to write a Trip Distance Calculator that calculates the approximate driving distance for a trip that visits multiple cities. The approximate driving distance between two cities is often depicted in a mileage chart. Mileage chart is a two-dimensional table that lists across rows and columns. To find the distance between two cities, find the cell that is the intersection between the origination city row and the destination city column (or vice versa). Write a program that lists a menu of cities, including an exit option, and keeps track of the total estimated driving miles as each city is chosen. When the user exits, the final total estimated driving miles are displayed. You could ask for city pairs, but it is preferred that you repetitively ask for a city, assuming that you are driving from the prior selection to the current selection.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | RATNAPURA | Kandy | Colombo | Galle |
| Ratnapura | 0 | 34 | 62 | 128 |
| Kandy | 34 | 0 | 90 | 152 |
| Colombo | 58 | 90 | 0 | 62 |
| Galle | 128 | 152 | 62 | 0 |

#include<iostream>

using namespace std;

int main() {

int trp[4][4]= {0,34,62,128,34,0,90,152,58,90,0,62,128,152,62,0};

int total=0;

int i,j;

char a;

while(a!='n'){

cout << " \*\*\*WELCOME TO THE TRIP ADVICER\*\*\*\n";

cout << " =====================================\n\n";

while(true){

cout << " Enter 1 -Ratnapura\n";

cout << " Enter 2 - Kandy\n";

cout << " Enter 3 - Colombo\n";

cout << " Enter 4 - Galle\n\n";

cout << " Enter your current location :-";

cin >> i;

cout << "\n";

if(0<i && i<5){

break;

}if(0>i || 4<i){cout << " Invalid input\n\n";

}

}

total=total+trp[i-1][j-1];

cout <<" Do you wish to travel further yes(y)/no(n) ? ";

cin >>a;

cout << "\n";

if(a=='n'){

cout<<" Total distance to be travelled is "<< total<<"Km\n";

}

else{

int temp;

int jj;

temp = trp[i][j];

trp[i][j] = trp[j][jj];

trp[j][jj] = temp;

while(true){

cout<<" Please enter your destination - ";

cin>> jj;

if(0<jj && jj<5){

break;

}if(0>jj || 4<jj){cout << " Invalid input\n\n";

}}

total = total = trp[j-1][jj-1];

cout <<"\n total distance to be travelled is " <<total << "Km\n\n"<<endl;

}

}

return 0;

}