

Theory Assignment-1

Q. Program that create a random 2D array and then print the 2D array and the diagonal elements from right to left and left to right.

Code:-

```
//Harsh Bamotra AC-1216
//Program to randomly create a 6x6 array
//and create two arrays containing the diagonal elements

#include <iostream>
#include <stdlib.h>
#include <time.h>
using namespace std;

//defining function for creating an array that contains the diagonal elements from left to right

void diogl(int arr[6][6] , int arr1[6])
{
    for(int i=0 ; i<6 ; i++)
    {
        for(int j=0 ; j<6 ; j++)
        {
            if(i==j) //checking for diagonal elements
            {
                arr1[i]=arr[i][j]; // initializing the arr1 with the
            }
        } // diagonal elements from left to right
    }
}

//defining function for creating an array that contains the diagonal elements from right to left

void diogr(int arr[6][6] , int arr1[6])
{
    for(int i=0 ; i<6 ; i++)
    {
        for(int j=0 ; j<6 ; j++)
        {
            if(i+j==5) //checking for diagonal elements
            {
                arr1[i]=arr[i][j]; // initializing the arr1 with the
            }
        } // diagonal elements from right to left
    }
}
```

```

int main()
{
    srand(time(0));                //giving seed to rand() function
    int arr[6][6] , arr1[6] , arr2[6];    //defining arrays

    for(int i=0 ; i<6 ; i++)
    {
        for(int j=0 ; j<6 ; j++)
        {
            arr[i][j]=(rand()%(200-100+1))+100;    // initializing the array with
                                                    // random numbers from 100 to 199
        }
    }

    cout << "The randomly generated 2D array::";
    for(int i=0 ; i<6 ; i++)
    {
        cout << endl;
        for(int j=0 ; j<6 ; j++)
        {
            cout << arr[i][j] << " ";            //printing the 2D array
        }
    }

    diogl(arr , arr1);                //calling function diogl
    diogr(arr , arr2);                //calling function diogr


    cout << endl << "Diagonal elements from left to right::";
    for(int k=0 ; k<6 ; k++)
    {
        cout << arr1[k] << " ";                //printing the array containing diagonal
                                                    // elements from left to right
    }

    cout << endl << "Diagonal elements from right to left::";
    for(int k=0 ; k<6 ; k++)
    {
        cout << arr2[k] << " ";                //printing the array containing diagonal
                                                    // elements form right to left
    }

    return 0;
}

```

Output:-

 Command Prompt

```
Microsoft Windows [Version 10.0.19042.746]
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C:\Users\harsh>cd desktop

C:\Users\harsh\Desktop>g++ Random_array.cpp -o Random_array.exe

C:\Users\harsh\Desktop>Random_array.exe
The randomly generated 2D array::
198 143 147 165 137 142
197 156 156 111 131 129
191 123 178 107 107 110
101 141 198 135 129 128
103 155 130 110 158 157
104 188 153 111 113 139
Diagonal elements from left to right::198 156 178 135 158 139
Diagonal elements from right to left::142 131 107 198 155 104
C:\Users\harsh\Desktop>Random_array.exe
The randomly generated 2D array::
117 108 141 198 169 126
187 166 114 176 153 191
134 188 138 176 104 137
177 117 182 171 196 112
167 164 142 155 134 182
132 122 181 180 110 172
Diagonal elements from left to right::117 166 138 171 134 172
Diagonal elements from right to left::126 153 176 182 164 132
C:\Users\harsh\Desktop>
```

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