

:: Computer Science C++ Important Questions ::

1 Write a function in C++, which accepts an integer array and its size as parameters and rearranges the array in descending order.

Example: If an array of nine elements initially contains the elements as

4	2	5	1	6	7	8	12	10
---	---	---	---	---	---	---	----	----

Then the function should rearrange the array as

12	10	8	7	6	5	4	2	1
----	----	---	---	---	---	---	---	---

Ans.

```
#include<iostream.h>
#include<conio.h>
void select_sort(int a[ ], int n)
{
    int i, j, p, large;
    for(i=0; i<n-1; i++)
    {
        large=a[i];
        p=i;
        for(j=i+1; j<n; j++)
        {
            if(a[j]>large)
            {
                large=a[j];
                p=j;
            }
        }
        a[p]=a[i];
        a[i]=large;
    }
}
void main()
{
    int a[9]={4,2,5,1,6,7,8,12,10};
    int n=0;
    int i=0;
    clrscr();
    n=sizeof a/sizeof(int); //total size of array/size of array data type
    cout<<n;
    cout<<"\n Original array is : \n";
    for(i=0; i<n; i++)
        cout<<a[i]<<" ";
    select_sort(a,n);
    cout<<"\nThe sorted array is: \n";
    for(i=0; i<n; i++)
        cout<<a[i]<<" ";
    getch();
}
```

2 An array Arr[40][10] is store in the memory along the column with each element occupying 4 bytes. Find out the base address of the location Arr[3][6] if the location Arr[30][10] is stored at the address 9000.

Ans.

Given Data: Array[40][10] W=4 B=? R=40 C=10 $L_r = 0$ $L_c = 0$

Address of Array [3][6] =?

Address of Array[30][10] =9000.

Address of an element (I,J) in column major =B + W ((I- L_r) + R(J- L_c))

Therefore $9000=B+4*((30-0)+40(10-0))$

$9000=B+4*(30+40*10)$

$9000 =B+4*430$

$9000=B+1720$

$B =9000-1720$

$B =7280$

Therefore Address of Array[3][6]= $7280+4*((3-0)+40(6-0))$

$=7280+4*(3+40*6)$

$=7280+4*243$

$=7280+972$

$=8252$

3 Write a function in C++ to print the product of each column of a two dimensional array passed as the arguments of the function.

Example: If the two dimensional array contains

1	2	4
3	5	6
4	3	2
2	1	5

Then the output should appear as:

Product of Column 1 = 24

Product of Column 2 = 30

Product of Column 3 =240

Ans.

```
#include<conio.h>
#include<iostream.h>
void colProduct(int arr[4][3],int r,int c)
{
    int arr2[3];
    for(int i=0;i<c;i++)          //loop for column
    {
        arr2[i]=1;
        for(int j=0;j<r;j++)      //loop for rows
            arr2[i] *= arr[j][i];
    }
    cout<<"Product of Column " <<i+1<<"= " <<arr2[i]<<endl;
}
void main()
{
    int arr[4][3]={{1,2,4},{3,5,6},{4,3,2},{2,1,5}};
    clrscr();
    colProduct(arr,4,3);
    getch();
}
```

4 Write a function in C++, which accepts an integer array and its size as arguments and swap the elements of every even location with its following odd location.

Example: If an array of nine elements initially contains the elements as

2	4	1	6	5	7	9	23	10
---	---	---	---	---	---	---	----	----

then the function should rearrange the array as

4	2	6	1	7	5	23	9	10
---	---	---	---	---	---	----	---	----

Ans.

```
#include<conio.h>
#include<iostream.h>
void swapElement(int arr[ ], int no)
{
    int temp;
    for(int i=0;i<no-1;i+=2)
    {
        temp=arr[i];
        arr[i]=arr[i+1];
        arr[i+1]=temp;
    }
    cout<<"\nThe elements after completed the alterations";
    for(i=0;i<no;i++)
        cout<<arr[i]<<" ";
}
void main()
{
    int arr[9]={2,4,1,6,5,7,9,23,10};
    clrscr();
    swapElement(arr,9);
    getch();
}
```

5 An array Arr[50][10] is store in the memory along the row with each element occupying 2 bytes. Find out the Base address of the location Arr[20][50], if the location Arr[10][25] is stored at the address 10000.

Ans.

This question was misprinted and was controversial.

Which one will be correct -

(i) in place of Arr[50][10] it shall be Arr[50][100]

Or

(ii) in place of location Arr[20][50], if the location Arr[10][25]

it shall be be location Arr[20][5], if the location Arr[10][2]

6 Write a function in C++ to print the product of each row of a two dimensional array passed as the arguments of the function Example: if the two dimensional array

20	40	10
40	50	30
60	30	20
40	20	30

contains

Then the output should appear as:

Product of Row 1 = 8000

Product of Row 2 = 6000

Product of Row 3 = 3600

Product of Row 4 = 2400

Ans.

```
#include<conio.h>
#include<iostream.h>
void rowProduct(int arr[4][3],int r,int c)
{
    long arr2[4];
    for(int i=0;i<r;i++)
    {
        arr2[i]=1;
        for(int j=0;j<c;j++)
        {
            arr2[i] *= arr[i][j];
        }
        cout<<"Product of Row "<<i+1<<"= "<<arr2[i]<<endl;
    }
}
void main()
{
    int arr[4][3]={{20,40,10},{40,50,30},{60,30,20},{40,20,30}};
    clrscr();
    rowProduct(arr,4,3);
    getch();
}
```

7 Write function in C++ which accepts an integer array and size as arguments and replaces elements having odd values with thrice its value and elements having even values with twice its value.

Example : if an array of five elements initially contains elements as

3	4	5	16	9
---	---	---	----	---

The the function should rearrange the content of the array as

9	8	75	32	27
---	---	----	----	----

Ans.

```
#include<conio.h>
#include<iostream.h>
void manipulate(int a[],int size)
{
    for(int i=0;i<size;i++)
    {
        if (a[i]%2==1)
            a[i]=a[i]*3;
        else
            a[i]=a[i]*2;
        cout<<a[i]<<',';
    }
}
```

```

void main()
{
    int a[5]={2,3,4,5,6};
    clrscr();
    manipulate(a,5);
    getch();
}

```

8 An array Array[20][15] is stored in the memory along the column with each element occupying 8 bytes. Find out the base address of the element Array[2][3] if the element Array[4][5] is stored at the address 1000.

Given Data: Array[20][15] W=8 B=? R=20 C=15 L_r=0 L_c=0

Address of Array [2][3] =?

Address of Array[4][5] =1000.

Address of an element (I,J) in column major=B+W((I-L_r)+R(J-L_c))

Therefore 1000=B+8*((4-0)+20(5-0))

1000=B+8*(4+20*5)

1000 =B+8*104

1000=B+832

B=1000-832

B=168

Therefore Address of Array[2][3]=168+8*((2-0)+20(3-0))

=168+8*(2+20*3)

=168+8*62

=168+496

=664

9 Write a function in C++ which accepts a 2D array of integers and its size as arguments and displays the elements which lie on diagonals. [Assuming the 2D Array to be a square matrix with odd dimension i.e., 3x3, 5x5, 7x7 etc...]

Example: if the array content is

5 4 3

6 7 8

1 2 9

Output through the function should be :

Diagonal One : 5 7 9

Diagonal Two : 3 7 1

```

#include<conio.h>
#include<iostream.h>
void diag(int a[3][3],int size)
{
    cout<<"First Diagonal:";
    for (int i=0;i<size;i++)
        for(int j=0;j<size;j++)
            if(i==j)
                cout<<a[i][j]<<" ";
    cout<<"\n Second Diagonal:";
    for(i=0;i<size;i++)
        for(j=0;j<size;j++)
            if((i+j)==(size-1))
                cout<<a[i][j]<<" ";
}

```

```

void main()
{
    int a[3][3]={{5,4,3},{6,7,8},{1,2,9}};
    clrscr();
    diag(a,3);
    getch();
}

```

10 Write a function in C++ which accepts an integer array and its size as arguments and replaces elements having even values with its half and elements having odd values with twice its value .

Example : If an array of five elements initially contains the elements as

3	4	5	16	9
---	---	---	----	---

then the function should rearrange content of the array as

6	2	10	8	18
---	---	----	---	----

Ans.

```

#include<conio.h>
#include<iostream.h>
void accept(int a[ ],int size)
{
    for (int i=0;i<size;i++)
    {
        if(a[i]%2==0)
            a[i]=a[i]/2;
        else
            a[i]=a[i]*2;
        cout<<a[i]<<',';
    }
}

void main()
{
    int a[5]={3,4,5,16,9};
    clrscr();
    accept(a,5);
    getch();
}

```