TUTORIAL 6

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1 Write a function that uses pointers to search for the address of a given integer in a given array. If the given integer is found, the function returns its address; otherwise, it returns NULL.

```
#include<iostream>
using namespace std;

int* findAddress(int arr[],int n,int m)
{
  int *ptr1=&arr[0];
  int f=0;
for(int h=0;h<n;h++)
{
    ptr1=ptr1+1;
    if(*(ptr1)==m)
    {
        f=1;
       break;
    }
}
if(f==1)
    {
        return ptr1;
    }
    else
    {
        return NULL;
    }
}
int main()
{
    int x;
    int n;
    cout<<"Enter number of elements in the array ";
    cin>>n;
    int arr[n];
    for(int i=0;i<n;i++)
    {
        cout<<"Enter element"<<" "<<i<<endl;
        int c;
        cin>>c;
        arr[i]=c;
        cout<<endl;
    }
    cout<<"Enter the integer whose address needs to be printed";
```

```
    cin>>x;
    cout<<findAddress(arr,n,x);

}
```

Output-

```
Enter number of elements in the array 5
Enter element 0
1

2

Enter element 2
3

Enter element 3
4

Enter element 4
5

Enter the integer whose address needs to be printed 5
0x7bfdb0
PS C:\Users\HP\OneDrive\Desktop\C++\Assignment 6> cd "c:\Users\HP\
Enter number of elements in the array 5
Enter element 0
1

Enter element 1
2

Enter element 2
3

Enter element 3
4

Enter element 4
5

Enter the integer whose address needs to be printed 6
0
PS C:\Users\HP\OneDrive\Desktop\C++\Assignment 6>
```

2. A company has four salespersons (1 to 4) who sell five different products (1 to 5). Once a day, every salesperson gives a slip for each product sold, containing the following information:

- Salesperson number
- Product number
- The total value of the product sold is Rs. (integer).

Use a 2-dimensional array called sales to represent the data and write a program to take the slip information from a salesperson and put it inappropriate position in the 2-D array.

```
#include<iostream>
using namespace std;

int main(){
    int sales[4][5];
    for(int i=0;i<4;i++)
    {
        cout<<"Value of Product 1: ";
        cin>>sales[i][0];
        cout<<"Value of Product 2: ";
        cin>>sales[i][1];
        cout<<"Value of Product 3: ";
        cin>>sales[i][2];
        cout<<"Value of Product 4: ";
        cin>>sales[i][3];
        cout<<"Value of Product 5: ";
        cin>>sales[i][4];
    }
    //to print the data set
    cout<<"            "<<" "<<"Product 1"<<" "<<"Product 2"<<" "<<"Product
3"<<" "<<"Product 4"<<" "<<"Product 5"<<endl;
    for(int i=0;i<4;i++)
    {
        cout<<"Salesman
"<<i+1<<"          "<<sales[i][0]<<"       "<<sales[i][1]<<"         "<<sales[
i][2]<<"           "<<sales[i][3]<<"          "<<sales[i][4]<<endl;
    }
    return 0;
}
```

Code screenshot-

```cpp
#include<iostream>
using namespace std;

int main(){
    int sales[4][5];
    for(int i=0;i<4;i++)
    {
        cout<<"Value of Product 1: ";
        cin>>sales[i][0];
        cout<<"Value of Product 2: ";
        cin>>sales[i][1];
        cout<<"Value of Product 3:";
        cin>>sales[i][2];
        cout<<"Value of Product 4: ";
        cin>>sales[i][3];
        cout<<"Value of Product 5: ";
        cin>>sales[i][4];
    }
    //to print the data set
    cout<<"            "<<" "<<"Product 1"<<" "<<"Product 2"<<" "<<"Product 3"<<" "<<"Product 4"<<" "<<"Product 5"<<endl;
    for(int i=0;i<4;i++)
    {
        cout<<"Salesman "<<i+1<<"         "<<sales[i][0]<<"       "<<sales[i][1]<<"         "<<sales[i][2]<<"          "<<sales[i][3]<<
    }
    return 0;
}
```

OUTPUT-

```
PS C:\Users\HP\OneDrive\Desktop\C++\Assignment 6> cd "c:\Users\HP\One
Value of Product 1: 1
Value of Product 2: 2
Value of Product 3:3
Value of Product 4: 4
Value of Product 5: 5
Value of Product 1: 6
Value of Product 2: 7
Value of Product 3:8
Value of Product 4: 9
Value of Product 5: 1
Value of Product 1: 2
Value of Product 2: 3
Value of Product 3:4
Value of Product 4: 5
Value of Product 5: 6
Value of Product 1: 7
Value of Product 2: 8
Value of Product 3:9
Value of Product 4: 1
Value of Product 5: 2
             Product 1 Product 2 Product 3 Product 4 Product 5
Salesman 1          1       2         3          4          5
Salesman 2          6       7         8          9          1
Salesman 3          2       3         4          5          6
Salesman 4          7       8         9          1          2
PS C:\Users\HP\OneDrive\Desktop\C++\Assignment 6>
```

3. Write a program to multiply two arrays A and B. If the sizes of the matrices are not compatible for multiplication, display an error message. Use functions to compute the result of the multiplication.

```
#include <iostream>
using namespace std;
int Multiplyer (int m1 , int n1 , int A[] , int m2 , int n2 , int B[] , int
R[])
    {

    if (n1 != m2)
        {

        return 0;

        }

    for (int i = 0 ; i<m1 ; i++)
        {

        for (int j = 0 ; j<n2 ; j++)
            {

            for (int k = 0 ; k<n1 ; k++)
                {

                R[(i*n2)+j]+=A[(i*n1)+k]*B[(k*n2)+j];

                }

            }

        }

    return 1;

    }

int main()
    {

    int m1,n1;

    cout<<"Enter no. of rows and columns of first matrix: \n";

    cin>>m1>>n1;

    int A[m1*n1];
```

```
    cout<<"Enter first Matrix \n";

    for (int k = 0; k<m1*n1; k++)
        {

        cin>>A[k];

        }

    int m2,n2;

    cout<<"Enter no. of rows and columns of second matrix: "<<endl;

    cin>>m2>>n2;

    int B[m2*n2];

    cout<<"Enter second Matrix: "<<endl;

    for (int k = 0; k<m2*n2; k++)
        {

        cin>>B[k];

        }

    int R[m1*n2]={0};

    int x = Multiplyer (m1 , n1 , A , m2 , n2 , B , R);

    if (x)
        {

        cout<<"The Resulting Matrix is \n";

        for (int i = 0 ; i < m1 ; i++)
            {

            for (int j = 0 ; j < n2 ; j++)
                {

                cout<<R[(i*n2)+j]<<"\t";

                }

            cout<<"\n";

            }
```

```
        }

    else
        {

    cout<<"The matrices are incompatible with multiplication" ;

        }

    }
```

OUTPUT-

```
.\3_parth_copy }
Enter no. of rows and columns of first matrix:
2 3
Enter first Matrix
1 2 3 4 5 6
Enter no. of rows and columns of second matrix:
3 2
Enter second Matrix
1 2 3 4 5 6
The Resulting Matrix is
22      28
49      64
PS C:\Users\HP\OneDrive\Desktop\C++\Assignment 6>
```

4. Write a program to first take the values of a 4×4 matrix from the user. Then use a function to compute the determinant of that matrix.

```
#include <iostream>
using namespace std;
int Determinant1x1(int* a)
    {

    int Determinant = 0;

    Determinant = *a;

    return Determinant;

    }

int Determinant2x2(int* a , int* b)
    {
```

```
    int Determinant = 0;

    Determinant+= (*a) * (Determinant1x1(b+4));
    Determinant-= (*b) * (Determinant1x1(a+4));

    return Determinant;

    }

int Determinant3x3(int* a , int* b , int* c)
    {

    int Determinant = 0;

    Determinant+= (*a) * (Determinant2x2(b+4,c+4));
    Determinant-= (*b) * (Determinant2x2(a+4,c+4));
    Determinant+= (*c) * (Determinant2x2(a+4,b+4));

    return Determinant;

    }

int Determinant4x4(int* a , int* b , int* c , int* d)
    {

    int Determinant = 0;

    Determinant+= (*a) * (Determinant3x3(b+4,c+4,d+4));
    Determinant-= (*b) * (Determinant3x3(a+4,c+4,d+4));
    Determinant+= (*c) * (Determinant3x3(a+4,b+4,d+4));
    Determinant-= (*d) * (Determinant3x3(a+4,b+4,c+4));

    return Determinant;

    }

int main()
    {

    int A[4][4];

    cout<<"Enter the Matrix \n";

    for (int i = 0; i<4; i++)
        {

        for (int j = 0; j<4; j++)
```

```
            {

            std::cin>>A[i][j];

            }

        }

    cout<<"The Determinant is
"<<Determinant4x4(&(A[0][0]),&(A[0][1]),&(A[0][2]),&(A[0][3]));


    }
```

```
PS C:\Users\HP\OneDrive\Desktop\C++\Assignmen
Enter the Matrix
1 2 3 4
1 2 3 4
1 2 3 4
1 2 3 4
The Determinant is 0
PS C:\Users\HP\OneDrive\Desktop\C++\Assignmen
```

5. Write a program to reverse a string using pointers and functions.

```
#include<iostream>
#include<string>
using namespace std;
void replace(char*p1,char* p2)
{
    char c=*p1;
    *p1=*p2;
    *p2=c;
}
int main()
{
    string c;
    cout<<"Enter the string ";
    cin>>c;
    int l=c.length();
    char arr[l];
    char* p1;
    char* p2;
    for(int i=0;i<l;i++)
```

```
    {
        arr[i]=c[i];
    }
    for(int i=0;i<l/2;i++)
    {
        p1=&arr[i];
        p2=&arr[l-i-1];
        replace(p1,p2);
    }
     for(int i=0;i<l;i++)
    {
         cout<<arr[i];
    }

    return 0;
}
```

Output-

```
Enter the string arshita
atihsra
PS C:\Users\HP\OneDrive\Desktop\C++\Assignme
Enter the string hihello
ollehih
PS C:\Users\HP\OneDrive\Desktop\C++\Assignme
```

6. Write a program that:

•Takes a string as an input from the user.

•Arranges the characters in the string in alphabetical order (capital letters are to be assumed to be ahead of small letters in the order).

•Uses pointers to assign new places to the characters.

```
#include<iostream>
#include<string>
using namespace std;
void swap(char* a, char *b)
{
  char f;
  f=*a;
  *a=*b;
  *b=f;
}
int main()
```

```
{
    string s;
    cout<<"enter string: ";
    cin>>s;
    int l= s.length();
    char arr[l];
     for(int i=0;i<l;i++)
    {
        arr[i]=s[i];
    }
    for(int j=0;j<l;j++)
    {
        for(int i=j+1;i<l;i++)
        {
            if((int)arr[i]<(int)arr[j])
            {
               swap(&arr[j],&arr[i]);
            }
        }
    }
    for(int i=0;i<l;i++)
    {
        cout<<arr[i];
    }
    return 0;
}
```

Output-

```
enter string: abcdABCD
ABCDabcd
PS C:\Users\HP\OneDrive\Desktop\C++\Assignment 6> cd "c:\Users\HP\OneDrive\
enter string: ABhGfabdc
ABGabcdfh
PS C:\Users\HP\OneDrive\Desktop\C++\Assignment 6>
```