



School Of Mechanical & Manufacturing Engineering

Department of Mechanical Engineering

CS-114 - Fundamental of Programing

Lab Manual # 08

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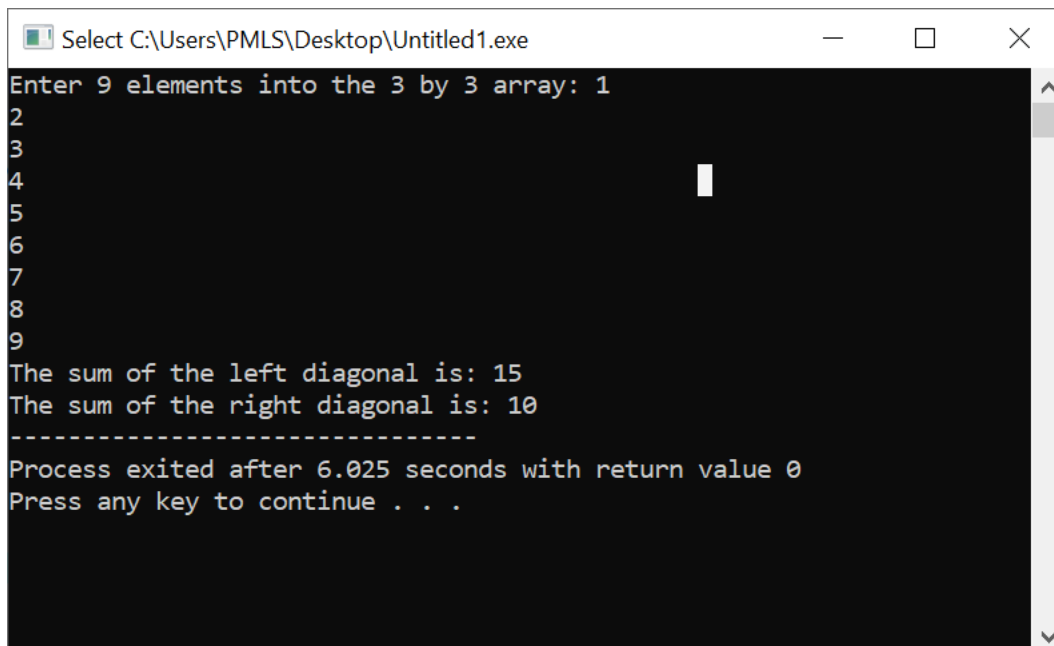
Date: 13-12-23

Task 1:

Code:

```
#include<iostream>
using namespace std;
int main()
{
    int i, j, sum1=0, sum2=0, a[3][3];
    cout<<"Enter 9 elements into the 3 by 3 array: ";
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            cin>>a[i][j];
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
        {
            if(i+j==2)
                sum1+=a[i][j];
            else if(i==j)
                sum2+=a[i][j];
        }
    cout<<"The sum of the left diagonal is: "<<sum1<<endl;
    cout<<"The sum of the right diagonal is: "<<sum2;
    return 0;
}
```

Output:



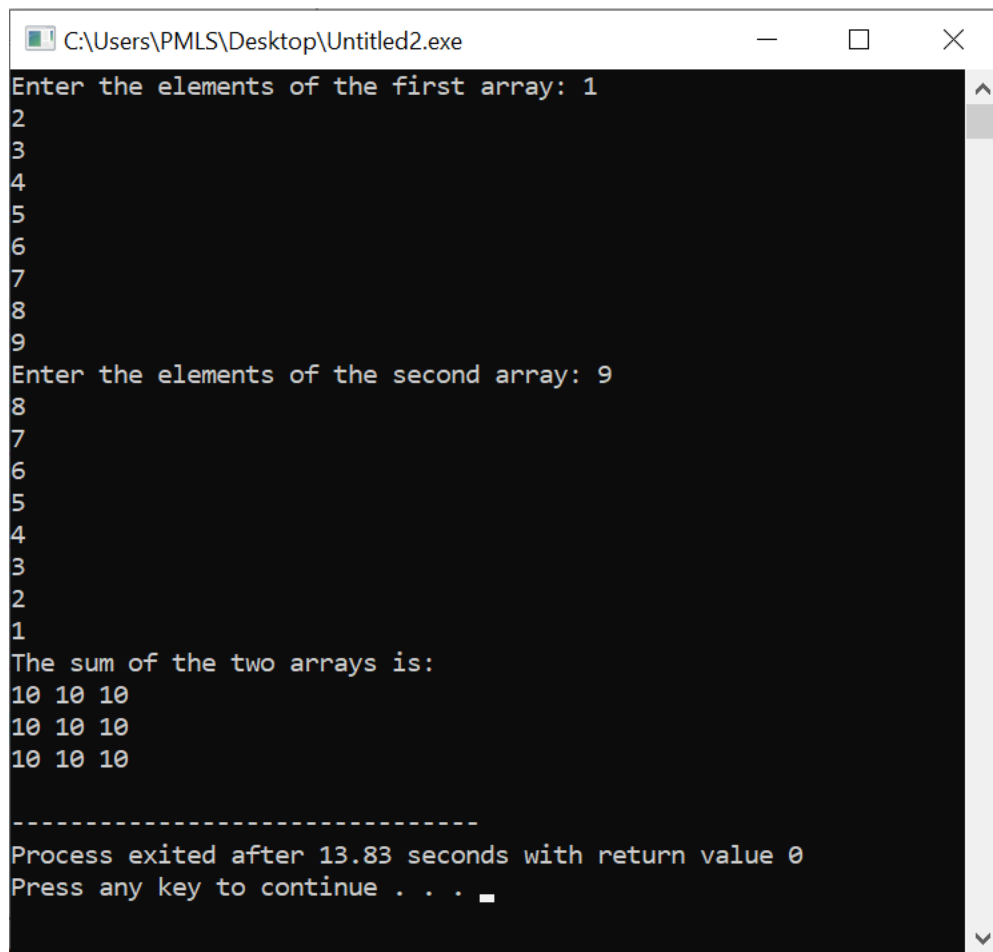
```
Select C:\Users\PMLS\Desktop\Untitled1.exe
Enter 9 elements into the 3 by 3 array: 1
2
3
4
5
6
7
8
9
The sum of the left diagonal is: 15
The sum of the right diagonal is: 10
-----
Process exited after 6.025 seconds with return value 0
Press any key to continue . . .
```

Task 2

Code:

```
#include<iostream>
using namespace std;
int main()
{
    int i, j, sum[3][3], a[3][3], b[3][3];
    cout<<"Enter the elements of the first array: ";
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            cin>>a[i][j];
    cout<<"Enter the elements of the second array: ";
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            cin>>b[i][j];
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            sum[i][j]=a[i][j]+b[i][j];
    cout<<"The sum of the two arrays is: \n";
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
            cout<<sum[i][j]<<" ";
        cout<<endl;
    }
    return 0;
}
```

Output:



```
C:\Users\PMLS\Desktop\Untitled2.exe
Enter the elements of the first array: 1
2
3
4
5
6
7
8
9
Enter the elements of the second array: 9
8
7
6
5
4
3
2
1
The sum of the two arrays is:
10 10 10
10 10 10
10 10 10

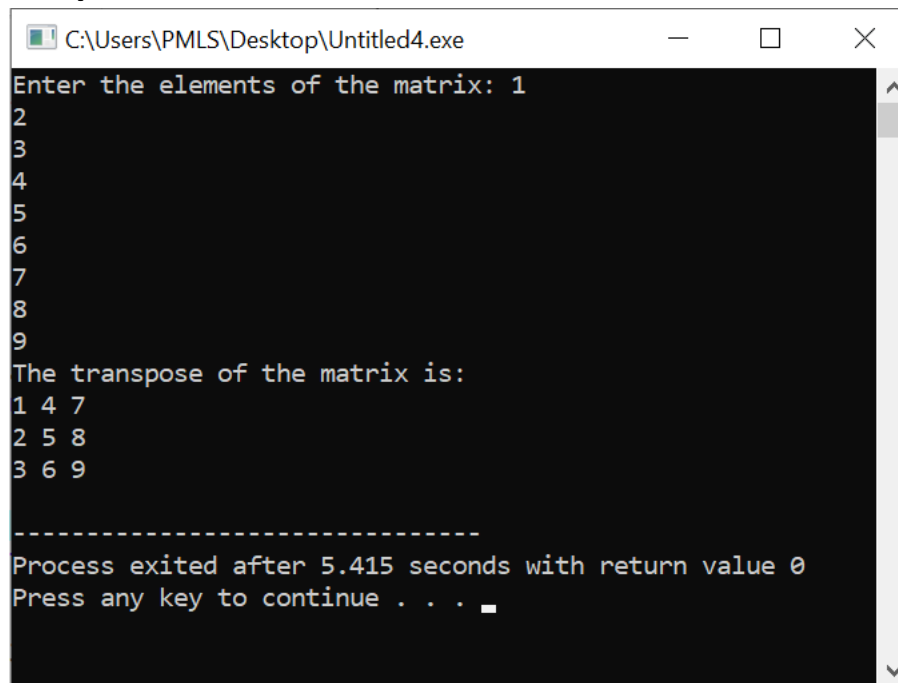
-----
Process exited after 13.83 seconds with return value 0
Press any key to continue . . .
```

TASK 3

Code:

```
#include<iostream>
using namespace std;
void transpose(int tran[][3], int x[][3])
{
    int i, j;
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            tran[i][j]=x[j][i];
}
int main()
{
    int i, j, tran[3][3], a[3][3];
    cout<<"Enter the elements of the matrix: ";
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            cin>>a[i][j];
    transpose(tran, a);
    cout<<"The transpose of the matrix is: \n";
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
            cout<<tran[i][j]<<" ";
        cout<<endl;
    }
}
```

Output:



```
C:\Users\PMLS\Desktop\Untitled4.exe
Enter the elements of the matrix: 1
2
3
4
5
6
7
8
9
The transpose of the matrix is:
1 4 7
2 5 8
3 6 9

-----
Process exited after 5.415 seconds with return value 0
Press any key to continue . . .
```

TASK 4

Code:

```
#include<iostream>
using namespace std;
void matrix_mult(int mult[][3], int x[][3], int y[][3])
{
    int sum, k, i, j;
    for (i=0; i<3; i++)
    {
        for (j=0; j<3; j++) {
            sum = 0;
            for (k=0; k<3; k++)
                sum += x[i][k]*y[k][j];
            mult[i][j] = sum;
        }
    }
}

int main()
{
    int i, j, mult[3][3], a[3][3], b[3][3];
    cout<<"Enter the elements of the first array: ";
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            cin>>a[i][j];
    cout<<"Enter the elements of the second array: ";
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            cin>>b[i][j];
    matrix_mult(mult, a, b);
    cout<<"The result of the multiplication is: \n";
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
            cout<<mult[i][j]<<" ";
        cout<<endl;
    }
}
```

Output:

```
C:\Users\PMLS\Desktop\Untitled3.exe
Enter the elements of the first array: 1
2
3
4
5
6
7
8
9
Enter the elements of the second array: 9
8
7
6
5
4
3
2
1
The result of the multiplication is:
30 24 18
84 69 54
138 114 90

-----
Process exited after 9.756 seconds with return value 0
Press any key to continue . . .
```

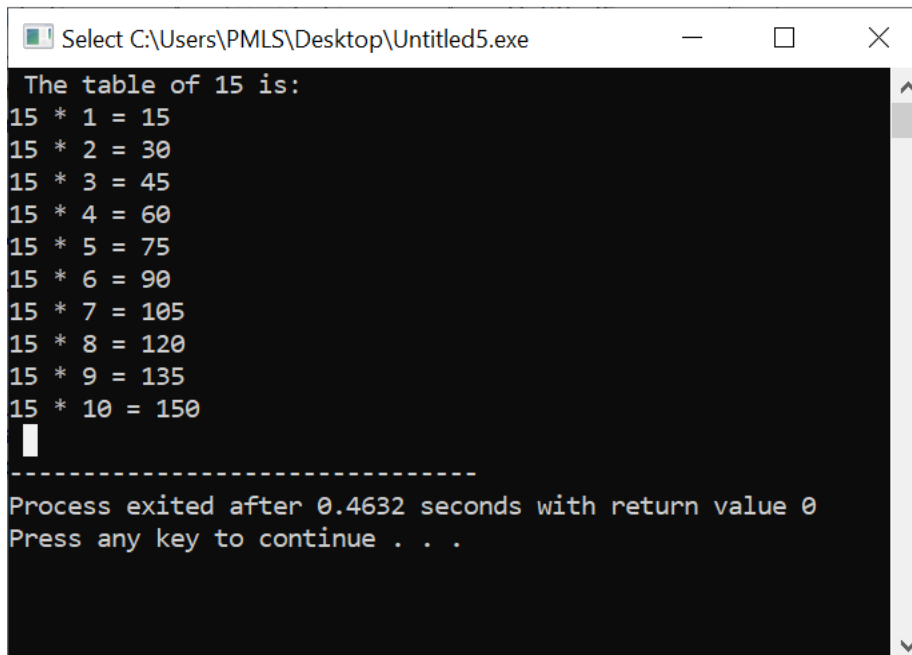

TASK 5

Code:

```
#include<iostream>
using namespace std;
int mult(int n, int x) {
    if (x==11)
        return 0;

    cout<<n<<" * "<<x<<" = "<<n*x<<endl;
    return mult(n, x+1);
}
int main()
{
    int number=15, p=1;
    cout<<" The table of 15 is: \n";
    mult(number, p);
    return 0;
}
```

Output:



```
Select C:\Users\PMLS\Desktop\Untitled5.exe
The table of 15 is:
15 * 1 = 15
15 * 2 = 30
15 * 3 = 45
15 * 4 = 60
15 * 5 = 75
15 * 6 = 90
15 * 7 = 105
15 * 8 = 120
15 * 9 = 135
15 * 10 = 150
-----
Process exited after 0.4632 seconds with return value 0
Press any key to continue . . .
```

