

**WINTER SEMESTER 2016**

**CSE2003: DATA STRUCTURES AND ALGORITHMS (EMBEDDED LAB) SLOT: L51+L52**

**FACULTY: THENDRAL.P**

**ASSIGNMENT-1**

---

**Name: VOLETI RAVI**

**15.** Write a program in C to get 4 – four digits number and then generate 4 sub-matrices of size 2 X 2 based on unique place values like 1's place, 10's place, 100's place and 1000's place, then add all the resultant sub-matrices to display the sum.

**Code:**

```
#include<stdio.h>
main()
{
    char l[4][4];
    int i=0;
    while(i<4){
        int n;

        printf("Enter the
        number:"); scanf("%d",&n);

        float y=n/1.0;
        int j=3, k=0;

        while(j>=0 && k<4){

            float x=pow(10,j);
            int z=y/x; l[i][k]=z;

            y=y-x*z;
            j=j-1;
            k=k+1;

        }

        i=i+1;
```

```

    }
    i=0;

    while(i<4){

        printf("Matrix %d:\n", i+1);
        printf("%d\t%d\n%d\t%d\n",l[i][0], l[i][1], l[i][2], l[i][3]);
        i=i+1;

    }
    i=0;

    int sum1=0,sum2=0,sum3=0,sum4=0;
    while(i<4){

        sum1=sum1+l[i][0];
        sum2=sum2+l[i][1];
        sum3=sum3+l[i][2];
        sum4=sum4+l[i][3];
        i=i+1;

    }

    printf("Sum Matrix:\n");
}    printf("%d\t%d\n%d\t%d", sum1,sum2,sum3,sum4)

```

**Output**

```
F:\Data Structures\DSA_Assign_1.exe
Enter the number:9872
Enter the number:1891
Enter the number:2512
Enter the number:3611
Matrix 1:
9      8
7      2
Matrix 2:
1      8
9      1
Matrix 3:
2      5
1      2
Matrix 4:
3      6
1      1
Sum Matrix:
15      27
18      6
-----
Process exited after 17.3 seconds with return value 10
Press any key to continue . . .
```

16. Write a C program to solve the following problem:- Get a 4x4 matrix and print the same. Create 2 new matrices by taking the squares of all outermost elements of the original matrix and by taking cubes of diagonal elements of the original matrix and display the same. Find out the sum of these two resultant matrices and display the same.

**Code:**

```
#include<stdio.h>
main(){
    int i=0; int
    l[4][4];
    int out[4][4];
    int diag[4][4];
    while(i<4){
```

```

        int j=0;
        while(j<4){
            printf("Enter number:");
            scanf("%d",&l[i][j]);
        }
        j=j+1;
    }
    i=i+1;
}
i=0;

printf("4 X 4 Matrix so Formed:\n");
while(i<4){
    printf("%d\t%d\t%d\t%d\n",l[i][0],l[i][1],l[i][2],l[i][3]);
    i=i+1;
}
i=0;
while(i<4){
    int j=0;
    while(j<4){
        if(i==0 || i==3)
            out[i][j]=l[i][j]*l[i][j];
        else
        {
            if(j==0 || j==3)
                out[i][j]=l[i][j]*l[i][j];
            else
                out[i][j]=0;
        }
        j=j+1;
    }
    i=i+1;
}
i=0;

printf("Matrix containing square of outer most elements:\n");
while(i<4){
    printf("%d\t%d\t%d\t%d\n",out[i][0],out[i][1],out[i][2],out[i][3]);
    i=i+1;
}
i=0;
while(i<4){
    int j=0;
    while(j<4){
        if(i==j)
            diag[i][j]=l[i][j]*l[i][j]*l[i][j];
        else
            diag[i][j]=0;
        j=j+1;
    }
    i=i+1;
}
printf("Matrix containing cube of diagonal elements:\n");
i=0;
while(i<4){

```


```

        printf("%d\t%d\t%d\t%d\n",diag[i][0],diag[i][1],diag[i][2],diag[i][3]);
        i=i+1;

    }
    int sum[4][4];
    i=0;
    while(i<4){
        int j=0;
        while(j<4){
            sum[i][j]=out[i][j]+diag[i][j];
            j=j+1;
        }
        i=i+1;
    }
    printf("Sum of the above two matrices:\n");
    i=0;
    while(i<4){
        printf("%d\t%d\t%d\t%d\n",l[i][0],l[i][1],l[i][2],l[i][3]);
        i=i+1;
    }
}

```

### Output:



```

F:\Data Structures\DSA_Assign_1.exe
Enter number:56
Enter number:12
Enter number:12
Enter number:18
Enter number:11
Enter number:11
4 X 4 Matrix so formed:
56    1    2    4
6     8    95   35
1     2    56   12
12    18    11   11
Matrix containing square of outer most elements:
81    1    4    16
36    0    0    1225
1     0    0    144
144   324   121   121
Matrix containing cube of diagonal elements:
729   0    0    0
0     512   0    0
0     0     175616  0
0     0    0    1331
Sum of the above two matrices:
56    1    2    4
6     8    95   35
1     2    56   12
12    18    11   11
-----
Process exited after 24.48 seconds with return value 12
Press any key to continue . . .

```