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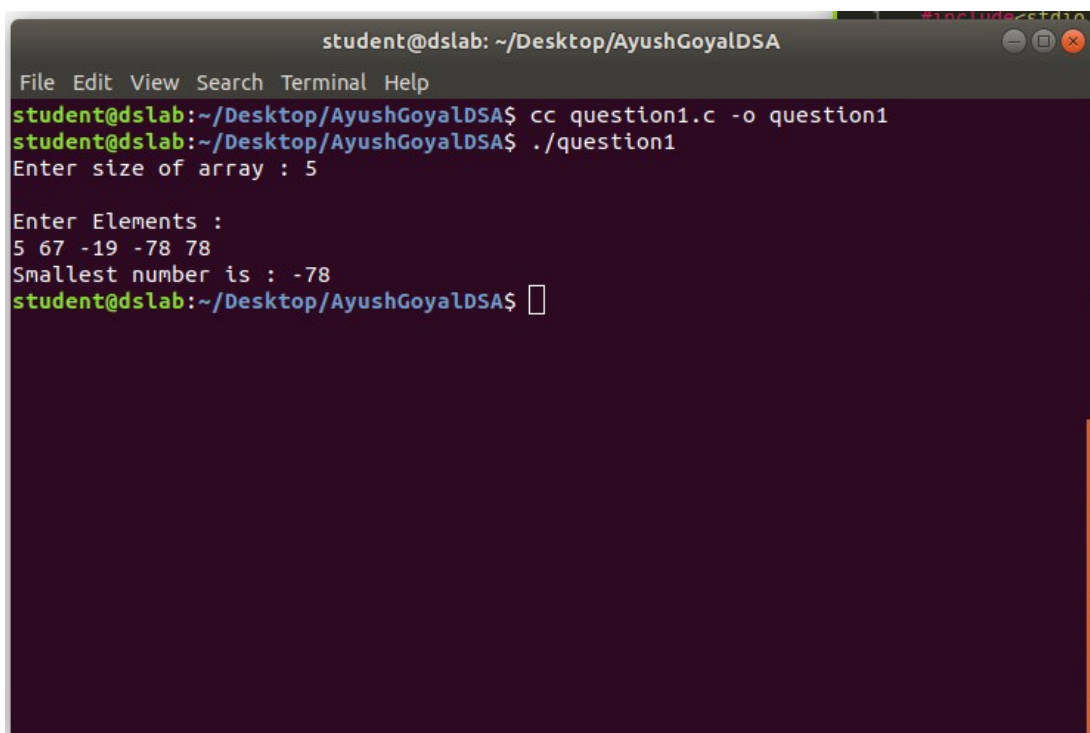
## DSA Lab 1

Q1)

```
#include<stdio.h>
#include<stdlib.h>
```

```
int smallest(int* arr , int n)
{
    int *s,*l,*i;
    l = arr+n-1;
    s = arr;
    for(i=arr+1;i<=l;i++)
    {
        if(*i < *s)
            s = i;
    }
    return *s;
}

int main()
{
    int n;
    printf("Enter size of array : ");
    scanf("%d",&n);
    int* arr = (int*)calloc(n,sizeof(int));
    int i;
    printf("\nEnter Elements : \n");
    for(i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }
    int s = smallest(arr,n);
    printf("Smallest number is : %d\n",s);
    return 0;
}
```



```
student@dslab: ~/Desktop/AyushGoyalDSA
File Edit View Search Terminal Help
student@dslab:~/Desktop/AyushGoyalDSA$ cc question1.c -o question1
student@dslab:~/Desktop/AyushGoyalDSA$ ./question1
Enter size of array : 5

Enter Elements :
5 67 -19 -78 78
Smallest number is : -78
student@dslab:~/Desktop/AyushGoyalDSA$
```

Q2)

```
#include<stdio.h>
#include<stdlib.h>
void read(int **m, int r, int c){
    int i,j;
    printf("\n");
    for(i=0;i<r;i++){
        /*(*(m+i)+0) = c;
        printf("Enter elements for row %d : ",i+1);
        fflush(stdin);
        for(j=0;j<c;j++){
            scanf("%d",(*(m+i)+j));
        }
    }
}

void disp(int **m, int r, int c){
    int i,j;
    for(i=0;i<r;i++){
        for(j=0;j<c;j++){
            printf("%3d",*(*(m+i)+j));
        }
        printf("\n");
    }
    printf("\n");
}

void multiply(int **m1, int **m2, int r, int c){
    int **p = (int**)calloc(r+1,sizeof(int*));
    int i,j,k;
    for(i=0;i<r;i++){
        p[i] = (int*)calloc(c,sizeof(int));
    }
    p[i] = NULL;
    int sum=0;
    for(int i=0;i<r;i++){
        for(int j=0;j<c;j++){
            for(int k=0;k<r;k++){
                sum+=(m1[i][k]*m2[k][j]);
            }
            p[i][j]=sum;
            sum=0;
        }
    }

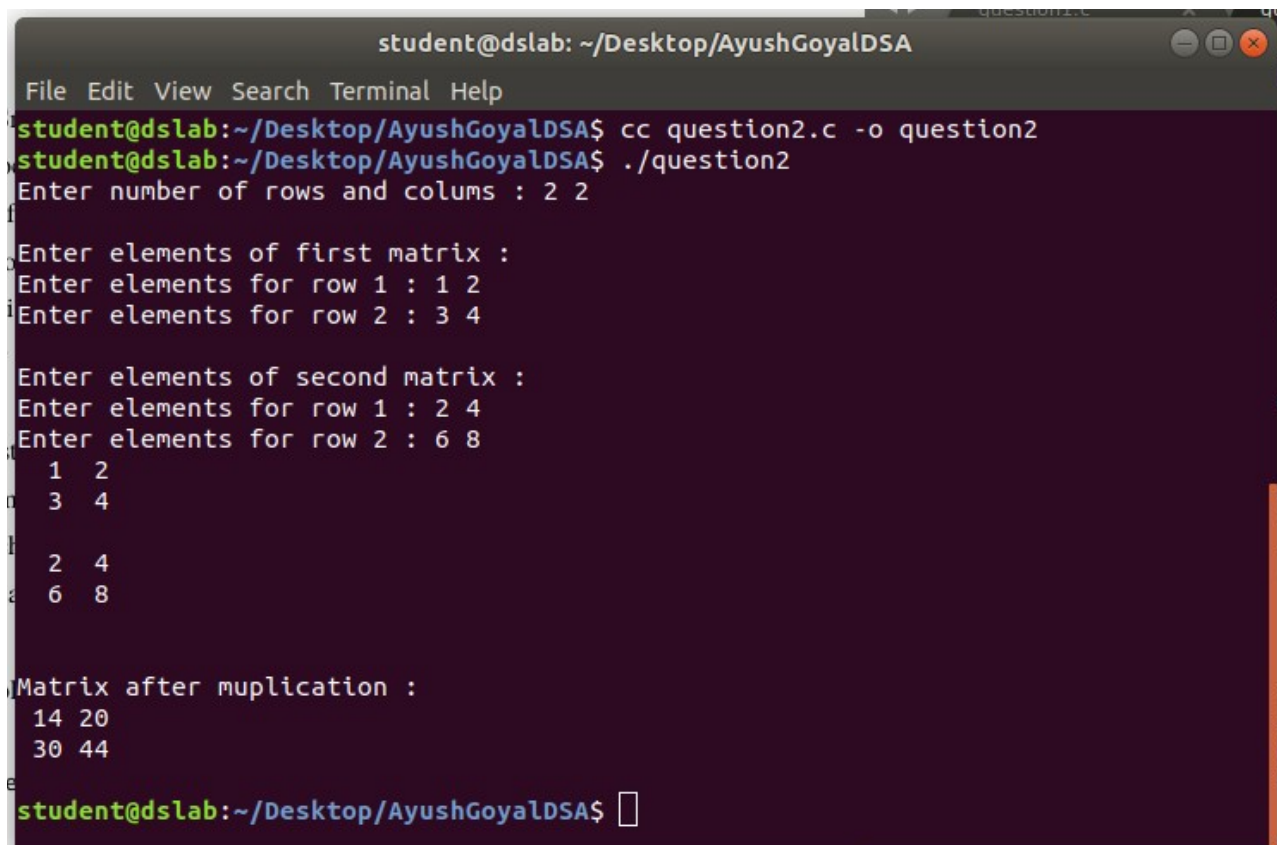
    printf("\nMatrix after muplication : \n");
    disp(p,r,c);
}
```

```

int main()
{
    int **mat1,**mat2;
    int r,c,i;
    printf("Enter number of rows and columns : ");
    scanf("%d %d",&r,&c);
    mat1 = (int **)calloc(r+1,sizeof(int*));
    mat2 = (int **)calloc(r+1,sizeof(int*));
    for(i=0;i<r;i++)
    {
        mat1[i] = (int *)calloc(c,sizeof(int));
        mat2[i] = (int *)calloc(c,sizeof(int));
    }
    mat1[i] = NULL;
    mat2[i] = NULL;

    printf("\nEnter elements of first matrix : ");
    read(mat1,r,c);
    printf("\nEnter elements of second matrix : ");
    read(mat2,r,c);
    disp(mat1,r,c);
    disp(mat2,r,c);
    multiply(mat1,mat2,r,c);
    return 0;
}

```



The screenshot shows a terminal window titled "student@dslab: ~/Desktop/AyushGoyalDSA". The user has compiled a C program named "question2.c" into an executable named "question2". The program prompts the user to enter the number of rows and columns, which are both 2. It then prompts for the elements of the first matrix, which are 1 2 for the first row and 3 4 for the second row. Next, it prompts for the elements of the second matrix, which are 2 4 for the first row and 6 8 for the second row. The program then displays the two matrices side-by-side. Finally, it shows the result of the matrix multiplication, which is a 2x2 matrix with elements 14 20 in the first row and 30 44 in the second row.

```

student@dslab: ~/Desktop/AyushGoyalDSA
File Edit View Search Terminal Help
student@dslab:~/Desktop/AyushGoyalDSA$ cc question2.c -o question2
student@dslab:~/Desktop/AyushGoyalDSA$ ./question2
Enter number of rows and columns : 2 2

Enter elements of first matrix :
Enter elements for row 1 : 1 2
Enter elements for row 2 : 3 4

Enter elements of second matrix :
Enter elements for row 1 : 2 4
Enter elements for row 2 : 6 8
1 2
3 4

2 4
6 8

Matrix after muplication :
14 20
30 44
student@dslab:~/Desktop/AyushGoyalDSA$ 

```

Q3)

```
#include <stdio.h>
```

```
struct DOB {  
    int date, month, year;  
};
```

```
struct ADRS {  
    int house_no;  
    long zipcode;  
    char state[20];  
};
```

```
struct EMPLOYEE {  
    char name[20];  
    struct DOB dob;  
    struct ADRS address;  
};
```

```
void read(struct EMPLOYEE* e){  
    printf("\nEnter Employee Details : \n");  
    printf("Name : ");  
    scanf("%s",e->name);  
    printf("DOB (dd mm yyyy): ");  
    scanf("%d %d %d",&(e->dob.date),&(e->dob.month),&(e->dob.year));  
    printf("Address : \n House No.:");  
    scanf("%d",&(e->address.house_no));  
    printf("Zipcode : ");  
    scanf("%ld",&(e->address.zipcode));  
    printf("State : ");  
    scanf("%s",e->address.state);  
}
```

```
void disp(struct EMPLOYEE* e){  
    printf("\nName : %s \nDOB : %d/%d/%d \nAddress : %d , %s , %ld\n\n", e->name,e->dob.date,e->dob.month,e->dob.year,e->address.house_no,e->address.state,e->address.zipcode);  
}
```

```
int main()  
{  
    int n,i;  
    struct EMPLOYEE emp[10];  
    struct EMPLOYEE* ptr = emp;  
  
    printf("Enter number of employees : ");  
    scanf("%d",&n);  
  
    for(i=0;i<n;i++){  
        read(ptr+i);  
    }  
    printf("\n\nAll the details are : \n\n");
```

```
        for(i=0;i<n;i++){
            disp(ptr+i);
        }
    return 0;
}
```

```
student@dslab: ~/Desktop/AyushGoyalDSA
File Edit View Search Terminal Help
student@dslab:~/Desktop/AyushGoyalDSA$ cc question3.c -o question3
student@dslab:~/Desktop/AyushGoyalDSA$ ./question3
Enter number of employees : 2

Enter Employee Details :
Name : Ayush
DOB (dd mm yyyy): 10 11 2001
Address :
    House No.:39
    Zipcode : 700055
    State : Kolkata

Enter Employee Details :
Name : Anubhav
DOB (dd mm yyyy): 6 11 2001
Address :
    House No.:34
    Zipcode : 700045
    State : Kolkata

All the details are :

Name : Ayush
DOB : 10/11/2001
Address : 39 , Kolkata , 700055

Name : Anubhav
DOB : 6/11/2001
Address : 34 , Kolkata , 700045
student@dslab:~/Desktop/AyushGoyalDSA$
```