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1	**1) Write a C program to generate Pascal triangle using two dimensional array** **Input:** Enter the n value: 4 **Output:** 1 1 1 1 2 1 1 3 3 1

	Program:
	
	**#include<stdio.h>
	#include<conio.h>
	void pascaltriangle(int n; int a[][n], int n);
	void displaypascal(int n; int a[][n], int n);
	int main()
	{
	int a[50][50],n;
	printf("Enter the value of n ");
	scanf("%d",&n);
	pascaltriangle(a,n);
	
	return 0;
	}
	void pascaltriangle(int n; int a[][n], int n)
	{
	int i,j;
	for(i=1;i<=n;i++)
	{
	for(j=1;j<=i;j++)
	{
	if(j==1 || j==i)
	{
	a[i][j] = 1;
	}
	else
	{
	a[i][j] = a[i-1][j]+a[i-1][j-1];
	}
	}
	}**

```
        displaypascal(a,n);
}
void displaypascal(int n; int a[][n], int n)
{
        int i,j,k;
        for(i=1;i<=n;i++)
        {
                for(j=1;j<=i;j++)
                {
                        printf("%d ",a[i][j]);
                }
                printf("\n");
        }
}
```

Output Screenshot:

```
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_6>gcc Program1.c

D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_6>a
Enter the value of n 5
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1

D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_6>a
Enter the value of n 6
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
```

2 Write a C program to read elements in a matrix and check whether the given matrix is symmetric matrix or not.

Input:

Enter the value of m

3

Enter the value of n

3

Enter elements in matrix of size 3x3:

1

0

0

0

1

0

0

0

1

Output:

The given matrix is Symmetric matrix:

1 0 0

0 1 0

0 0 1

Program:

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

int main()
{
        int a[50][50],n,m;
        printf("Enter the value of m ");
        scanf("%d",&m);
        printf("Enter the value of n ");
        scanf("%d",&n);
        printf("Enter the elements of the %dx%d matrix ",m,n);
        int i,j;
        for(i=1;i<=m;i++)
        {
                for(j=1;j<=n;j++)
                {
                        scanf("%d",&a[i][j]);
                }
        }
        int r,c,b[50][50];
        for(r=1;r<=m;r++)
        {
                for(c=1;c<=n;c++)
                {
                        b[c][r] = a[r][c];
                }
```

```
        }
        int isSymmetric = 1;
        for(i=1,r=1;i<=m,r<=m;i++,r++)
        {
                for(j=1,c=1;j<=n,c<=n;j++,c++)
                {
                        if(a[i][j] == b[r][c])
                                continue;
                        else
                        {
                                isSymmetric = 0;
                                break;
                        }
                }
        }
        if(isSymmetric)
                printf("The matrix is symmetric ");
        else
                printf("The matrix is not symmetric ");
        return 0;
}
```

Output Screenshot:

```
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_6>gcc Program2.c

D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_6>a
Enter the value of m 3
Enter the value of n 3
Enter the elements of the 3x3 matrix 1 0 0 0 1 0 0 0 1
The matrix is symmetric
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_6>a
Enter the value of m 3
Enter the value of n 3
Enter the elements of the 3x3 matrix 1 2 3 4  5 6 7 8 9
The matrix is not symmetric
```

3 Write a C program to compare 2 dates and print appropriate message using structures

Input1:

Enter Date1 in the format dd/mm/yyyy

12/2/2000

Enter Date2 in the format dd/mm/yyyy

12/2/2000

Date1=12/2/2000

Date2=12/2/2000

Output1:

	Date1 is equal to Date2 Input2: Enter Date1 in the format dd/mm/yyyy 12/3/2000 Enter Date2 in the format dd/mm/yyyy 12/3/2001 Date1=12/3/2000 Date2=12/3/2001 **Output2:** Date1 is smaller than Date2 **Input3:** Enter Date1 in the format dd/mm/yyyy 12/4/1999 Enter Date2 in the format dd/mm/yyyy 12/2/1999 Date1=12/4/1999 Date2=12/2/1999 **Output3:** Date1 is greater than Date2
	Program: **#include<stdio.h>** **#include<conio.h>** **typedef struct date** **{** **int dd;** **int mm;** **int yyyy;** **}date_info;** **void date_read(date_info *d);** **void display_date(date_info *d);** **int date_cmp(const date_info *d1, const date_info *d2);** **int main()** **{**

```
        date_info d1,d2;

        printf("Enter Date1 ");
        date_read(&d1);
        printf("Enter Date2 ");
        date_read(&d2);
        printf("\nDate1 = ");
        display_date(&d1);
        printf("\nDate2 = ");
        display_date(&d2);

        int res = date_cmp(&d1,&d2);
        if(res==0)
                printf("\nDate1 is equal to Date2");
        else if(res>0)
                printf("\nDate1 is greater than Date2");
        else
                printf("\nDate1 is less than Date2");
        return 0;
}
void date_read(date_info *d)
{
        scanf("%d",&d->dd);
        scanf("%d",&d->mm);
        scanf("%d",&d->yyyy);
}
void display_date(date_info *d)
{
        printf("%d/%d/%d\n",d->dd, d->mm, d->yyyy);
}
int date_cmp(const date_info *d1, const date_info *d2)
{
        int res;
        if(d1->dd == d2->dd && d1->mm == d2->mm && d1->yyyy == d2->yyyy)
                res = 0;
        else if(d1->yyyy > d2->yyyy || d1->mm > d2->mm && d1->yyyy == d2->yyyy ||
d1->dd > d2->dd && d1->mm == d2->mm && d1->yyyy == d2->yyyy)
                res = 1;
        else
                res = -1;
        return res;
}
```

Output Screenshot:

```
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_6>a
Enter Date1 20 3 2021
Enter Date2 20 3 2020

Date1 = 20/3/2021

Date2 = 20/3/2020

Date1 is greater than Date2
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_6>a
Enter Date1 20 3 2020
Enter Date2 20 3 2020

Date1 = 20/3/2020

Date2 = 20/3/2020

Date1 is equal to Date2
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_6>a
Enter Date1 20 3 2020
Enter Date2 20 4 2020

Date1 = 20/3/2020

Date2 = 20/4/2020

Date1 is less than Date2
```

4

Write a C Program to Add and subtract two Complex Numbers by Passing Structure to a Function

Input:

For 1st complex number

Enter the real and imaginary parts: 5

4

For 2nd complex number

Enter the real and imaginary parts: 3

2

Output:

Sum = 8.0 + 6.0i

Sub = 2.0 - 2.0i

Program:

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


typedef struct complex
{
```

```
        int real;
        int img;
}complex_num;

void read_values(complex_num *c);
void display_complex(complex_num *c);
void add(complex_num *c1,complex_num *c2);
void sub(complex_num *c1,complex_num *c2);

int main()
{
        complex_num c1,c2;
        printf("Enter the real and imaginary part for first complex number: ");
        read_values(&c1);
        printf("Enter the real and imaginary part for second complex number: ");
        read_values(&c2);
        display_complex(&c1);
        display_complex(&c2);
        add(&c1,&c2);
        sub(&c1,&c2);
        return 0;
}
void read_values(complex_num *c)
{
        scanf("%d %d",&c->real,&c->img);
}
void display_complex(complex_num *c)
{
        printf("%d + %di\n",c->real,c->img);
}
void add(complex_num *c1,complex_num *c2)
{
```

```
        complex_num sum;
        sum.real = c1->real + c2->real;
        sum.img = c1->img + c2->img;
        printf("The sum is %d + %di\n",sum.real,sum.img);
}
void sub(complex_num *c1,complex_num *c2)
{
        complex_num sub;
        sub.real = c1->real - c2->real;
        sub.img = c1->img - c2->img;
        if(sub.img>0)
                printf("The difference is %d + %di\n",sub.real,sub.img);
        else
                printf("The difference is %d %di\n",sub.real,sub.img);
}
```

Output Screenshot:

```
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_6>gcc Program4.c

D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_6>a
Enter the real and imaginary part for first complex number: 10 6
Enter the real and imaginary part for second complex number: 8 3
10 + 6i
8 + 3i
The sum is 18 + 9i
The difference is 2 + 3i
```

Practice Programs

1 Write a program that fills a five-by-five matrix as follows:

Upper left triangle with +1s

Lower right triangle with -1s

Right to left diagonal with zeros

Display the contents of the matrix using not more than two printf statements

Output:

This is 5x5 Matrix

1 1 1 1 0

	1 1 1 0 -1 1 1 0 -1 -1 1 0 -1 -1 -1 0 -1 -1 -1 -1
	Program:
	Output Screenshot:
2	Write a Program to add two distances in the inch-feet system using structures **Input:** Enter 1st distance Enter feet: 23 Enter inch: 10 Enter 2nd distance Enter feet: 34 Enter inch: 2.4 **Output:** Sum of distances = 58'-0.4"
	Program:
	Output Screenshot: