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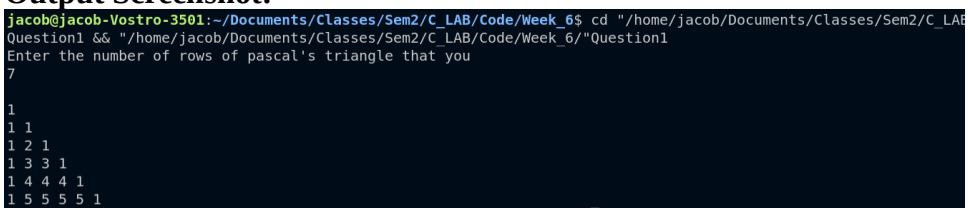
1	**1) Write a C program to generate Pascal triangle using two dimensional array** **Input:** Enter the n value: 4 **Output:** 1 1 1 1 2 1 1 3 3 1

	#include <stdio.h>
	
	int main()
	{
	int n;
	printf("Enter the number of rows of pascal's triangle that you\n");
	scanf("%d", &n);
	
	int array[n][n];
	
	for (int i = 0; i < n; i++)
	for (int j = 0; j < n; j++)
	{
	if (i == j + 1 || j == 0)
	array[i][j] = 1;
	else
	array[i][j] = i - 1;

```
}


for (int i = 0; i < n; i++)
{
for (int j = 0; j < i; j++)
printf("%d ", array[i][j]);
printf("\n");
}
}
```

Output Screenshot:



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

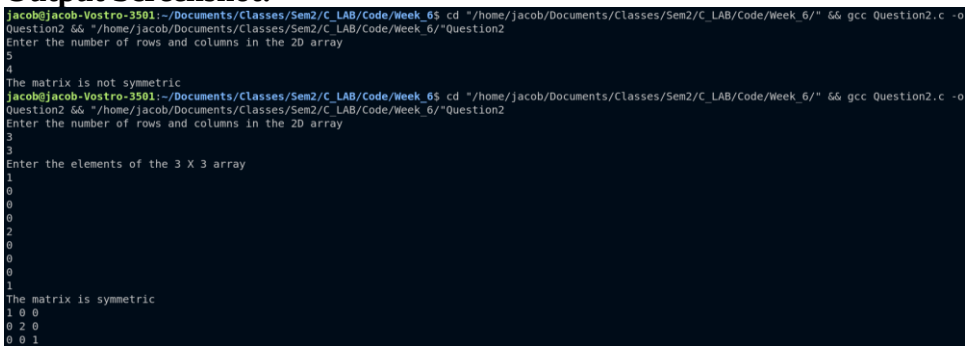
Program:

```
#include <stdio.h>



int main()
{
int m, n, count = 0;
printf("Enter the number of rows and columns in the 2D array\n");
scanf("%d%d", &m, &n);



if (m != n)
{
printf("The matrix is not symmetric\n");
return 0;
}



printf("Enter the elements of the %d X %d array\n", m, n);
```

```
int array[m][n];



for (int i = 0; i < m; i++)
for (int j = 0; j < n; j++)
scanf("%d", &array[i][j]);


int temp[n][m];



for (int i = 0; i < n; i++)
for (int j = 0; j < m; j++)
temp[i][j] = array[j][i];



for (int i = 0; i < n; i++)
for (int j = 0; j < m; j++)
if (temp[i][j] == array[i][j])
count++;



if (count == m * n)
{
printf("The matrix is symmetric\n");
for (int i = 0; i < m; i++)
{
for (int j = 0; j < n; j++)
printf("%d ", array[i][j]);
printf("\n");
}
```

```
}



else
{
printf("The matrix is non symmetric\n");
for (int i = 0; i < m; i++)
{
for (int j = 0; j < n; j++)
printf("%d ", array[i][j]);
printf("\n");
}
}
}
```

Output Screenshot:



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> struct date { int day; int month; int year;

```
} s1, s2;


int main()
{
printf("\n------------------Date 1------------------\n");
printf("Enter the day\n");
scanf("%d", &s1.day);
printf("Enter the month\n");
scanf("%d", &s1.month);
printf("Enter the year\n");
scanf("%d", &s1.year);


printf("\n------------------Date 2------------------\n");
printf("Enter the day\n");
scanf("%d", &s2.day);
printf("Enter the month\n");
scanf("%d", &s2.month);
printf("Enter the year\n");
scanf("%d", &s2.year);


if (s1.year == s2.year)
{
if (s1.month == s2.month)
{
if (s1.day == s2.day)
{
printf("The dates are the same\n");
```

```
}
else if (s1.day < s2.day)
{
printf("Date 1 precedes Date 2\n");
}
else
printf("Date 2 precedes Date 1\n");
}
else if (s1.month < s2.month)
{
printf("Date 1 precedes Date 2\n");
}
else
printf("Date 2 precedes Date 1\n");
}
else if (s1.year < s2.year)
{
printf("Date 1 precedes Date 2\n");
}
else
printf("Date 2 precedes Date 1\n");
}
```

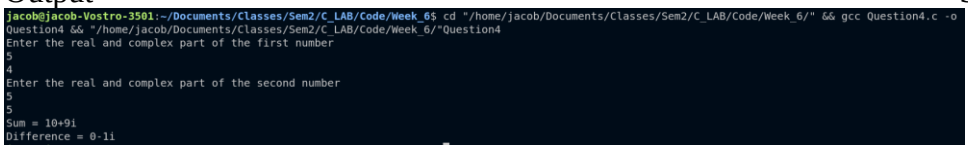
Output Screenshot:

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>
	
	struct complex
	{
	int real, imag;
	} s1, s2;
	
	int main()
	{
	printf("Enter the real and complex part of the first number\n");
	scanf("%d%d", &s1.real, &s1.imag);
	
	printf("Enter the real and complex part of the second number\n");
	scanf("%d%d", &s2.real, &s2.imag);
	
	int real = s1.real + s2.real;

```
int imag = s1.imag + s2.imag;


printf("Sum = %d+%di\n", real, imag);


int real1 = s1.real - s2.real;
int imag1 = s1.imag - s2.imag;


if (imag1 >= 0)
printf("Difference = %d+%di\n", real1, imag1);


else
printf("Difference = %d%di\n", real1, imag1);
}
```

Output Screenshot:



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:

```
#include <stdio.h>


int main()
{
int array[5][5];


for (int i = 0; i < 5; i++)
{
for (int j = 0; j < 5; j++)
array[i][j] = 1;
}


for (int i = 0; i < 5; i++)
{
for (int j = 0; j < 5; j++)
{
if (i + j == 4)
array[i][j] = 0;
```

```
if (i + j >= 5)
array[i][j] = -1;
}
}



for (int i = 0; i < 5; i++)
{
for (int j = 0; j < 5; j++)
{
if (array[i][j] == 1)
printf("%d ", array[i][j]);
else
printf("%d ", array[i][j]);
}
printf("\n");
}
}
```

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:
	#include <stdio.h>
	
	struct conv
	{
	float feet;
	float inch;
	} s1, s2;
	
	int main()
	{
	printf("Enter the feet and inch 1\n");
	scanf("%f%f", &s1.feet, &s1.inch);
	
	printf("Enter the feet and inch 2\n");
	scanf("%f%f", &s2.feet, &s2.inch);

```
float feet = s1.feet + s2.feet;
float inches = s1.inch + s2.inch;



int i = 0;



while (i == 0)
{
if (inches > 12)
{
i++;
inches = inches - 12;
feet++;
}
else
break;
}



printf("Sum of distances = %ffeet %finches\n", feet, inches);
}
```

Output Screenshot: