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SECTION : H

ASSINGMENT

Q1. C program to perform all arithmetic operations.

Input:

```
#include<stdio.h>
int main(){
   int a , b;
   printf("Enter two numbers");
   scanf("%d %d",&a,&b);
   printf("sum of a and b is: %d\n",a+b);
   printf("subtract of a and b is: %d\n",a-b);
   printf("Multiplication of a and b is: %d\n",a*b);
   printf("Divide of a and b is: %d\n",a/b);
   printf("modulus of a and b is: %d",a%b);
   return 0; }
```

OUTPUT:

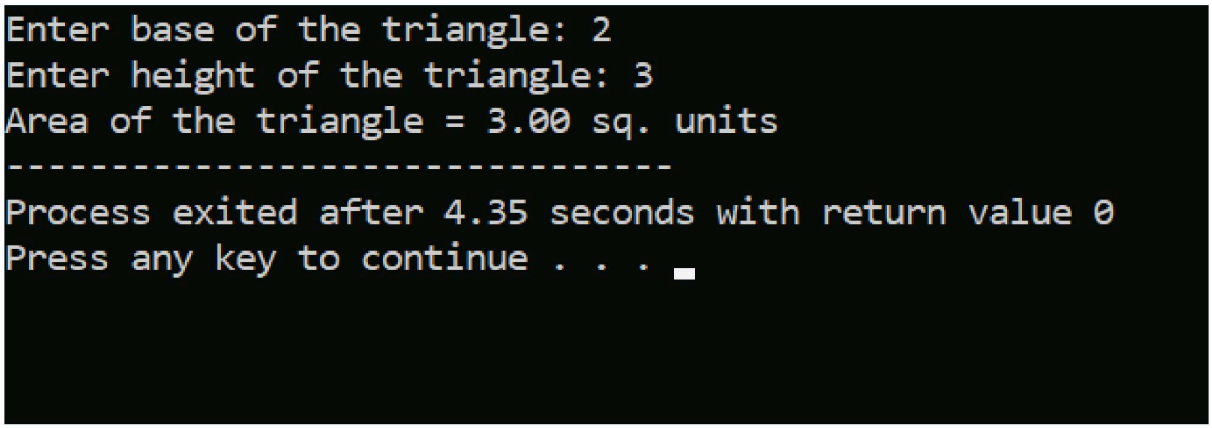
```
Enter two numbers8
6
sum of a and b is: 14
subtract of a and b is: 2
Multiplication of a and b is: 48
Divide of a and b is: 1
modulus of a and b is: 2
--------------------------------
Process exited after 3.698 seconds with return value 0
Press any key to continue . . .
```

Q2. C program to find area of a triangle if base and height are give

Input:

```
#include <stdio.h>
int main(){
   float base, height, area;
   printf("Enter base of the triangle: ");
   scanf("%f", &base);
   printf("Enter height of the triangle: ");
   scanf("%f", &height);
   area = (base * height) / 2;
   printf("Area of the triangle = %.2f sq. units", area);
 return 0;}
```

OUTPUT:



Q3. C program to find all angles of a triangle if two angles are given

INPUT:

```
#include <stdio.h>
int main(){
    int a, b, c;
    printf("Enter two angles of triangle: ");
    scanf("%d%d", &a, &b);
    c = 180 - (a + b);
    printf("Third angle of the triangle = %d", c);
   return 0;}
```

OUTPUT:

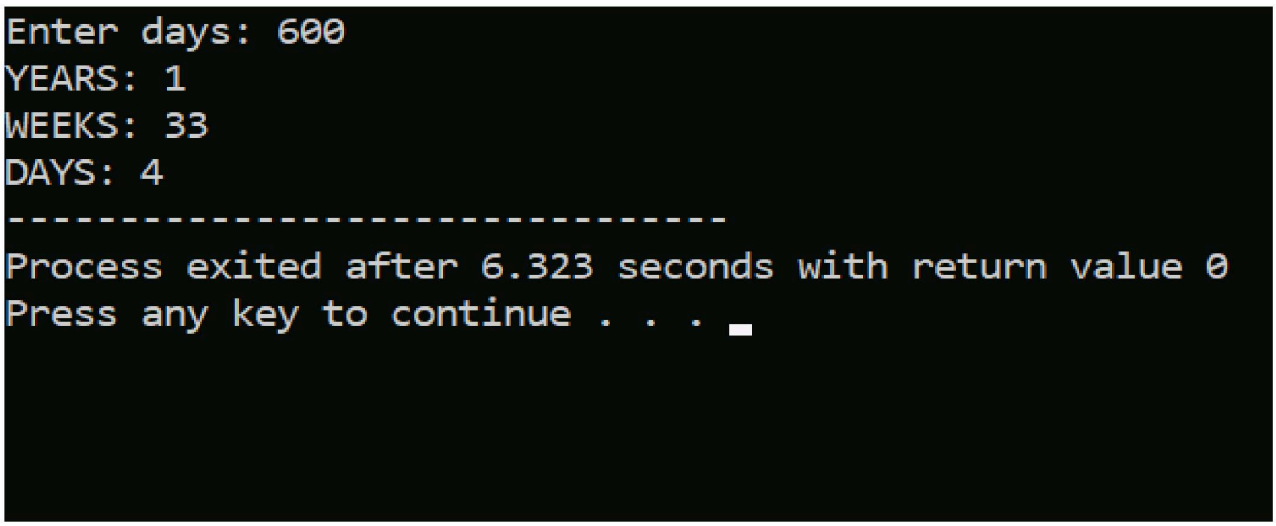
```
Enter two angles of triangle: 45
30
Third angle of the triangle = 105
--------------------------------
Process exited after 6.399 seconds with return value 0
Press any key to continue . . .
```

Q4. **C program to convert days in to years, weeks and days.**

INPUT.

```
#include <stdio.h>
int main(){
   int days, years, weeks;
   printf("Enter days: ");
   scanf("%d", &days);
   years = (days / 365);
   weeks = (days % 365) / 7;
   days  = days - ((years * 365) + (weeks * 7));
   printf("YEARS: %d\n", years);
   printf("WEEKS: %d\n", weeks);
   printf("DAYS: %d", days);
   return 0;
}
```

OUTPUT:

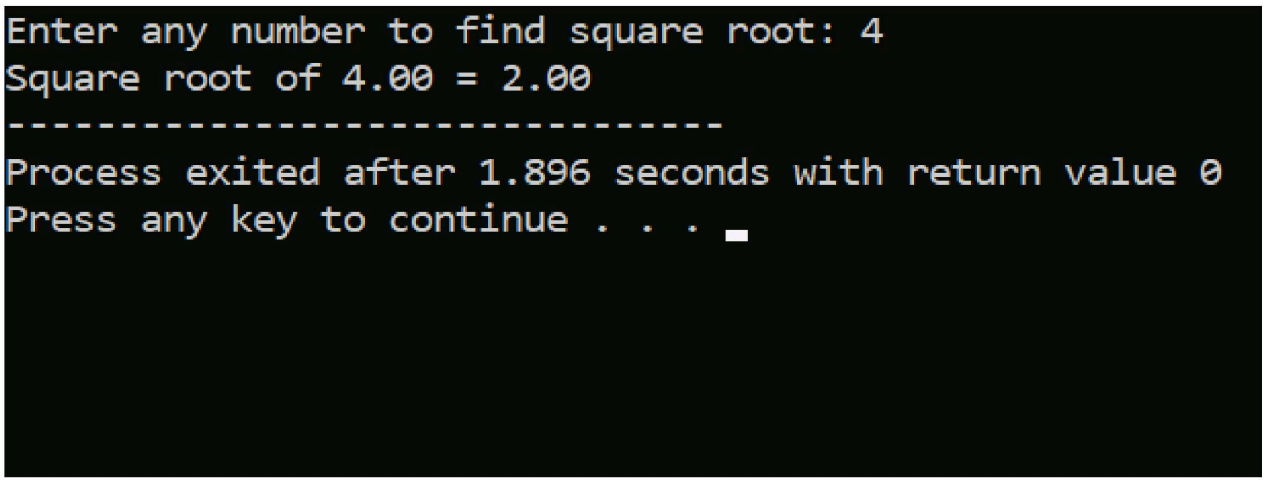


Q5. C program to find power and square root of any number.

INPUT:

```
#include <stdio.h>
int main()
{
   double num, root;
   printf("Enter any number to find square root: ");
   scanf("%lf", &num);
   root = sqrt(num);
   printf("Square root of %.2lf = %.2lf", num, root);
   return 0;
}
```

OUTPUT:



Q6. C program to calculate total, average and percentage and grades of five subjects.

Input:

```
#include <stdio.h>
int main(){
   float eng, phy, chem, math, comp;
   float total, average, percentage;
   printf("Enter marks of five subjects: :- ");
   scanf("%f%f%f%f%f", &eng, &phy, &chem, &math, &comp);
   total = eng + phy + chem + math + comp;
   average = total / 5.0;
   percentage = (total / 500.0) * 100;
   printf("Total marks = %.2f\n", total);
   printf("Average marks = %.2f\n", average);
   printf("Percentage = %.2f\n", percentage);
   if (percentage<=100)
   printf("O grade");
   else if(percentage>=80)
   printf("A+ grade");}
```

output:

```
Enter marks of five subjects: :- 90
90
89
90
78
Total marks = 437.00
Average marks = 87.40
Percentage = 87.40
O grade
```

Q7. C program to check Least Significant Bit (LSB) and MSB of a number using bitwise operator.

INPUT: LSB PROGRAM

```
#include <stdio.h>
int main(){
   int num;
   printf("Enter any number: ");
   scanf("%d", &num);
   if(num & 1)
      printf("LSB of %d is set (1).", num);
   else
      printf("LSB of %d is unset (0).", num);
   return 0;
}
```

OUTPUT:

```
Enter any number: 11
LSB of 11 is set (1).
--------------------------------
Process exited after 1.63 seconds with return value 0
```

INPUT: MSB PROGRAM

```
#include <stdio.h>
int main(){
```

```
    int num;
    printf("Enter any number: ");
    scanf("%d", &num);
    if(num & 1)
        printf("LSB of %d is set (1).", num);
    else
        printf("LSB of %d is unset (0).", num);
    return 0;
}
```

OUTPUT:

Q8. C program to swap two numbers USING 3RD VARIABLE AND WITHOUT 3RD VARIABLE.

INPUT:

```
#include <stdio.h>

int main(){

int var1, var2, temp;

printf("Enter two integrs");

scanf("%d%d", &var1, &var2);

printf("Before SwappingnFirst variable = %d\nSecond variable = %d\n", var1, var2);

temp = var1;

var1 = var2;

var2 = temp;

printf("After SwappingnFirst variable = %d\nSecond variable = %d\n", var1, var2);

return 0;}
```

OUTPUT:

```
Enter two integrs3
4
Before SwappingnFirst variable = 3
Second variable = 4
After SwappingnFirst variable = 4
Second variable = 3
```

Q9. C program to find maximum between three numbers using conditional operator AND Ternary Operator.

INPUT:

```
#include <stdio.h>
int main()  {
   int a, b, c, max;
   printf("Enter Three Integers\n");
   scanf("%d %d %d", &a, &b, &c);
   max = (a > b) ? ((a > c) ? a : c) : ((b > c) ? b : c);
   printf("Maximum Number is = %d\n", max);
   return 0;
}
```

OUTPUT:

```
Enter Three Integers
3
4
1
Maximum Number is = 4
```

Q10. C program to check alphabet, digit or special character using Conditional operator.

INPUT:

```
#include<stdio.h>
int main() {
  char ch;
  printf("\nEnter Any Character :");
  scanf("%c", & ch);
  if (ch >= '0' && ch <= '9') {
    printf("\n Entered Character is Digit");
  } else if (ch >= 'A' && ch <= 'Z') {
    printf("\n Entered Character is Capital Letter");
  } else if (ch >= 'a' && ch <= 'z') {
    printf("\n Entered Character is Small Letter");
  } else {
    printf("\n Entered Character is Special Character");
  }
  return 0;
}
```

OUTPUT:

```
Enter Any Character :U

 Entered Character is Capital Letter
```

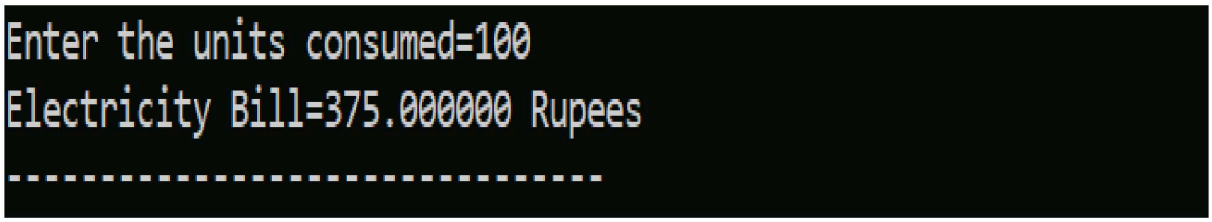
Q11. C program to calculate total electricity bill

INPUT:

```
#include<stdio.h>
int main()
{
	float bill, units;
	printf("Enter the units consumed=");
	scanf("%f",&units);
	if(units<=50 && units>=0)
	{
		bill=units*3.50;
		printf("Electricity Bill=%f Rupees",bill);
	}
	else if(units<=100 && units>50)
	{
		bill=50*3.50+(units-50)*4;
		printf("Electricity Bill=%f Rupees",bill);
	}
	else if(units<=250 && units>150)
	{
		bill=50*3.50+100*4+(units-150)*5.20;
		printf("Electricity Bill=%f Rupees",bill);
```

```
    }
    else if(units>250)
    {
        bill=50*3.50+100*4+100*5.20+(units-250)*6.50;
        printf("Electricity Bill=%f Rupees",bill);
    }
    else
    {
        printf("Please enter valid consumed units...");
    }
    return 0;
}
```

OUTPUT:



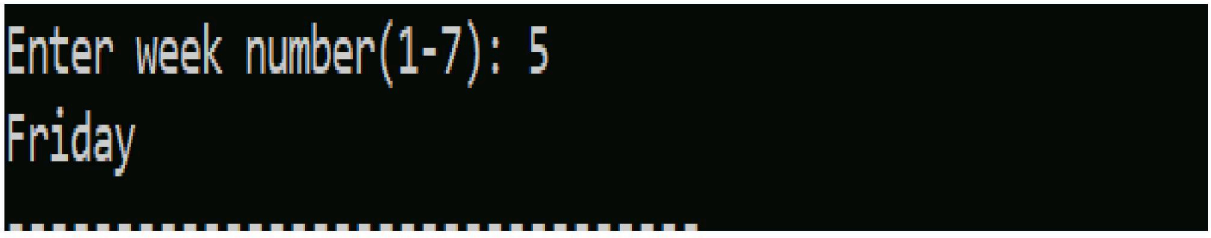
Q12. C program to create Simple Calculator AND Days of week using switch case.

INPUT:DAYS OF WEEK BY USING SWITCH

```
#include <stdio.h>
int main()
{
   int week;
   printf("Enter week number(1-7): ");
   scanf("%d", &week);
   switch(week)
   {
      case 1:
         printf("Monday");
         break;
      case 2:
         printf("Tuesday");
         break;
      case 3:
         printf("Wednesday");
         break;
      case 4:
         printf("Thursday");
```

```
            break;
        case 5:
            printf("Friday");
            break;
        case 6:
            printf("Saturday");
            break;
        case 7:
            printf("Sunday");
            break;
        default:
            printf("Invalid input! Please enter week number
between 1-7.");
    }
    return 0;
}
```

OUTPUT:



INPUT : CALCULATOR BY USING SWITCH

```
#include <stdio.h>
int main() {
  char op;
  double first, second;
  printf("Enter an operator (+, -, *, /): ");
  scanf("%c", &op);
  printf("Enter two operands: ");
  scanf("%lf %lf", &first, &second);
  switch (op) {
    case '+':
      printf("%.1lf + %.1lf = %.1lf", first, second, first +
second);
      break;
    case '-':
      printf("%.1lf - %.1lf = %.1lf", first, second, first -
second);
      break;
    case '*':
      printf("%.1lf * %.1lf = %.1lf", first, second, first *
second);
```

```
      break;
    case '/':
      printf("%.1lf / %.1lf = %.1lf", first, second, first /
second);
      break;
    default:
      printf("Error! operator is not correct");
  }
  return 0;
}
```

OUTPUT:

```
Enter an operator (+, -, *, /): *
Enter two operands: 5
4
5.0 * 4.0 = 20.0
```

Q13. C program to check vowel or consonant using switch case.

INPUT:

```
#include <stdio.h>
int main(){
   char ch;
   printf("Enter any alphabet: ");
   scanf("%c", &ch);
   switch(ch)  {
      case 'a':
         printf("Vowel");
         break;
      case 'e':
         printf("Vowel");
         break;
      case 'i':
         printf("Vowel");
         break;
      case 'o':
         printf("Vowel");
         break;
      case 'u':
         printf("Vowel");
         break;
```

```
        case 'A':
            printf("Vowel");
            break;
        case 'E':
            printf("Vowel");
            break;
        case 'I':
            printf("Vowel");
            break;
        case 'O':
            printf("Vowel");
            break;
        case 'U':
            printf("Vowel");
            break;
        default:
            printf("Consonant"); }
    return 0;
}
```

OUTPUT:

```
Enter any alphabet: A
Vowel
--------------------------------
```

Q14. C program to check positive negative or zero using switch case.

INPUT:

```
#include <stdio.h>
int main(){
   int num;
   printf("Enter any number: ");
   scanf("%d", &num);
   switch (num > 0){
      case 1:
         printf("%d is positive.", num);
      break;
      case 0:
         switch (num < 0) {
            case 1:
               printf("%d is negative.", num);
               break;
            case 0:
               printf("%d is zero.", num);
               break;}
      break;  }
 return 0;}
```

OUTPUT:

Q15. C program to check whether a triangle is Equilateral, Isosceles or Scalene.

INPUT:

```
#include<stdio.h>
int main(){
  int side1, side2, side3;
  printf("Enter sides of triangle:");
  scanf("%d%d%d",&side1,&side2,&side3);
  if(side1 == side2 && side2 == side3)
    printf("The Given Triangle is equilateral");
  else if(side1 == side2 || side2 == side3 || side3 == side1)
    printf("The given Triangle is isosceles");
  else
    printf("The given Triangle is scalene");
  return 0;
}
```

OUTPUT:

```
Enter sides of triangle:2
2
2
The Given Triangle is equilateral
```

Q16. C program to print all natural numbers AND sum of it from 1 to n.

INPUT:

```
#include <stdio.h>
int main()
{
   int i, n;
   printf("Enter any number: ");
   scanf("%d", &n);
   printf("Natural numbers from 1 to %d : \n", n);
   for(i=1; i<=n; i++)
   {
      printf("%d\n", i);
   }
   return 0;
}
```

OUTPUT:

```
Enter any number: 5
Natural numbers from 1 to 5 :
1
2
3
4
5

--------------------------------
```

Q17. C program to print all even numbers AND sum of it from 1 to n.

INPUT:

```
#include <stdio.h>
int main()
{
   int i, n, sum=0;
   printf("Enter upper limit: ");
   scanf("%d", &n);
   for(i=2; i<=n; i+=2)
   {
      sum += i;
   }
   printf("Sum of all even number between 1 to %d = %d", n, sum);
   return 0;
}
```

OUTPUT:

```
Enter upper limit: 10
Sum of all even number between 1 to 10 = 30
```

Q18. C program to print multiplication table of a number.

INPUT:

```
#include <stdio.h>
int main() {
  int n, i;
  printf("Enter an integer: ");
  scanf("%d", &n);
  for (i = 1; i <= 10; ++i) {
    printf("%d * %d = %d \n", n, i, n * i);
  }
  return 0;
}
```

OUTPUT:

```
Enter an integer: 5
5 * 1 = 5
5 * 2 = 10
5 * 3 = 15
5 * 4 = 20
5 * 5 = 25
5 * 6 = 30
5 * 7 = 35
5 * 8 = 40
5 * 9 = 45
5 * 10 = 50
```

Q19. C program to calculate factorial of a number.

INPUT:

```
#include<stdio.h>
int main()
{
   int fact=1,n;
   printf("Enter a number");
   scanf("%d",&n);
   for(int i=1;i<=n;i++)
   fact=fact*i;
   printf("%d",fact);
}
```

OUTPUT:

Q20. C program to check whether a number is palindrome or not.

INPUT:

```
#include<stdio.h>
int main(){
	int n,s=0,r,c;
	printf("enter a number");
	scanf("%d",&n);
	c=n;
	while(n>0){
		r=n%10;
		s=r+(s*10);
		n=n/10;}
	if(c==s)
	printf("pallidrom");
	else
	printf("not a palidrom");
	return 0;}
```

OUTPUT:

```
enter a number11
pallidrom
--------------------------------
```

Q21. C program to count frequency of digits in a given number.

INPUT:

```
 #include <stdio.h>
#define BASE 10
int main(){
    long long num, n;
    int i, lastDigit;
    int freq[BASE];
    printf("Enter any number: ");
    scanf("%lld", &num);
    for(i=0; i<BASE; i++){
        freq[i] = 0;}
    n = num;
    while(n != 0 {
        lastDigit = n % 10;
        n /= 10;
        freq[lastDigit]++ }
```

```
    printf("Frequency of each digit in %lld is: \n", num);
    for(i=0; i<BASE; i++) {
        printf("Frequency of %d = %d\n", i, freq[i]); }
    return 0;}
```

OUTPUT:

```
Enter any number: 277
Frequency of each digit in 277 is:
Frequency of 0 = 0
Frequency of 1 = 0
Frequency of 2 = 1
Frequency of 3 = 0
Frequency of 4 = 0
Frequency of 5 = 0
Frequency of 6 = 0
Frequency of 7 = 2
Frequency of 8 = 0
Frequency of 9 = 0
```

Q22. C program to find HCF(GCD) AND LCM of two numbers.

INPUT

```
#include <stdio.h>
int main() {
  int a, b, x, y, t, gcd, lcm;
  printf("Enter two integers\n");
  scanf("%d%d", &x, &y);
  a = x;
  b = y;
  while (b != 0) {
    t = b;
    b = a % b;
    a = t;}
  gcd = a;
  lcm = (x*y)/gcd;
  printf("Greatest common divisor of %d and %d = %d\n", x, y, gcd);
  printf("Least common multiple of %d and %d = %d\n", x, y, lcm);
  return 0;
}
```

OUTPUT:

```
Enter two integers
59
65
Greatest common divisor of 59 and 65 = 1
Least common multiple of 59 and 65 = 3835
```

Q23. C program to print all prime numbers between 1 to n.

INPUT:

```
#include<stdio.h>
void main(){
  int i, num, n, count;
  printf("Enter the range:");
  scanf("%d", &n);
  printf("The prime numbers in between the range 1 to %d:",n);
  for(num = 1;num<=n;num++){
    count = 0;
    for(i=2;i<=num/2;i++){
      if(num%i==0){
        count++;
      break;
    }
  }
  if(count==0 && num!= 1)
    printf("%d ",num);  }}
```

OUTPUT:

```
Enter the range:10
The prime numbers in between the range 1 to 10:2 3 5 7
--------------------------------
```

Q24. C program to print all Strong Numbers between 1 to n

INPUT:

```
#include <stdio.h>
int main(){
   int i, j, cur, lastDigit, end;
   long long fact, sum;
   printf("Enter upper limit: ");
   scanf("%d", &end);
   printf("All Strong numbers between 1 to %d are:\n", end);
   for(i=1; i<=end; i++){
      cur = i;
      sum = 0;
      while(cur > 0)   {
         fact = 1ll;
         lastDigit = cur % 10;
         for( j=1; j<=lastDigit; j++)   {
            fact = fact * j; }
         sum += fact;
         cur /= 10;}
      if(sum == i)   {
         printf("%d, ", i);  }    }
   return 0;}
```

OUTPUT:

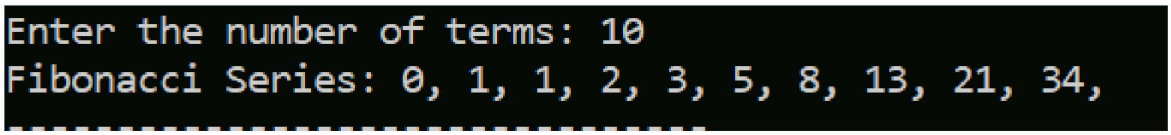
```
Enter upper limit: 1000
All Strong numbers between 1 to 1000 are:
1, 2, 145,
```

Q25. C program to print Fibonacci series up to n terms.

INPUT

```
#include <stdio.h>
int main() {
  int i, n;
  int t1 = 0, t2 = 1;
  int nextTerm = t1 + t2;
  printf("Enter the number of terms: ");
  scanf("%d", &n);
  printf("Fibonacci Series: %d, %d, ", t1, t2);
  for (i = 3; i <= n; ++i) {
    printf("%d, ", nextTerm);
    t1 = t2;
    t2 = nextTerm;
    nextTerm = t1 + t2;}
  return 0;}
```

OUTPUT:



Q26. C program to print Armstrong numbers from 1 to n AND Check a given number is Armstrong numbers or not.

INPUT:

```
#include<stdio.h>
 int main() {
int n,r,sum=0,temp;
printf("enter the number=");
scanf("%d",&n);
temp=n;
while(n>0)  {
r=n%10;
sum=sum+(r*r*r);
n=n/10;  }
if(temp==sum)
printf("armstrong  number ");
else
printf("not armstrong number");
return 0;}
```

OUTPUT:

```
enter the number=1
armstrong  number
```

Q27. C program to print all Perfect numbers between 1 to n AND Check a given number is Perfect numbers or not.

INPUT:

```
#include <stdio.h>
int main(){
   int i, j, end, sum;
   printf("Enter upper limit: ");
   scanf("%d", &end);
   printf("All Perfect numbers between 1 to %d:\n", end);
   for(i=1; i<=end; i++)  {
      sum = 0;
      for(j=1; j<i; j++)   {
         if(i % j == 0) {
            sum += j;   }    }
      if(sum == i)   {
         printf("%d, ", i);
 return 0;}
```

OUTPUT:

```
Enter upper limit: 100
All Perfect numbers between 1 to 100:
6, 28,
```

Q28. C program to find power of any number using for loop.

INPUT:

```
#include <stdio.h>
int main(void) {
  int base, exponent, result = 1;
  printf("Enter base: ");
  scanf("%d", &base);
  printf("Enter exponent: ");
  scanf("%d", &exponent);
  for (int i = 1; i <= exponent; ++i) {
    result *= base;}
  printf("%d to the power of %d is %d\n", base, exponent, result);
  return 0;
}
```

OUTPUT:

```
Enter base: 2
Enter exponent: 5
2 to the power of 5 is 32
```

Q29. C program to print ASCII values of all characters.

IUNPUT:

```
#include <stdio.h>
int main() {
    char c;
    printf("Enter a character: ");
    scanf("%c", &c);
    printf("ASCII value of %c = %d", c, c);
    return 0;
}
```

OUTPUT:

```
Enter a character: K
ASCII value of K = 75
```

Q30. C program to print Pascal triangle up to n rows.

INPUT

```
#include<stdio.h>
long factorial(int);
int main() {
   int i, n, c;
   printf("Enter the number of rows you wish to see in pascal triangle\n");
   scanf("%d", & n);
   for (i = 0; i < n; i++) {
      for (c = 0; c <= (n - i - 2); c++) printf(" ");
      for (c = 0; c <= i; c++) printf("%ld ", factorial(i) / (factorial(c) * factorial(i - c)));
      printf("\n");  }
   return 0; }
long factorial(int n) {
   int c;
   long result = 1;
   for (c = 1; c <= n; c++) result = result * c;
   return result; }
```

OUTPUT:

```
Enter the number of rows you wish to see in pascal triangle
5
    1
   1 1
  1 2 1
 1 3 3 1
1 4 6 4 1
```

Q31. C program to find sum of all elements of array.

INPUT:

```
#include <stdio.h>
 #include <conio.h>
int main(){
   int a[1000],i,n,sum=0;
   printf("Enter size of the array : ");
   scanf("%d",&n);
   printf("Enter elements in array : ");
   for(i=0; i<n; i++)
   {
      scanf("%d",&a[i]);
   }
   for(i=0; i<n; i++)
   {   sum+=a[i];
   }
    printf("sum of array is : %d",sum);
   return 0;}
```

OUTPUT:

```
Enter size of the array : 4
Enter elements in array : 1
2
3
4
sum of array is : 10
```

Q32. C program to copy one array to another array.

INPUT:

```
#include <stdio.h>
void main()
{
   int arr1[100], arr2[100];
   int i, n;
      printf("Input the number of elements to be stored in the array :");
      scanf("%d",&n);
      printf("Input %d elements in the array :\n",n);
      for(i=0;i<n;i++)
       {
            printf("element - %d : ",i);
            scanf("%d",&arr1[i]);
          }
   for(i=0; i<n; i++)
   {
      arr2[i] = arr1[i];
   }
   printf("\nThe elements stored in the first array are :\n");
```

```
    for(i=0; i<n; i++)
    {
        printf("% 5d", arr1[i]);
    }
    printf("\n\nThe elements copied into the second array are
:\n");
    for(i=0; i<n; i++)
    {
        printf("% 5d", arr2[i]);
    }
            printf("\n\n");
}
```

OUTPUT:

```
Input the number of elements to be stored in the array :4
Input 4 elements in the array :
element - 0 : 1
element - 1 : 2
element - 2 : 3
element - 3 : 4

The elements stored in the first array are :
    1    2    3    4

The elements copied into the second array are :
    1    2    3    4
```

Q33. C program to insert an element in array at specified position

INPUT:

```
#include <stdio.h>
int main()
{
   int array[100], position, c, n, value;
   printf("Enter number of elements in array\n");
   scanf("%d", &n);
   printf("Enter %d elements\n", n);
   for (c = 0; c < n; c++)
      scanf("%d", &array[c]);
   printf("Enter the location where you wish to
insert an element\n");
   scanf("%d", &position);
   printf("Enter the value to insert\n");
   scanf("%d", &value);
   for (c = n - 1; c >= position - 1; c--)
      array[c+1] = array[c];
```

```
   array[position-1] = value;
   printf("Resultant array is\n");
   for (c = 0; c <= n; c++)
      printf("%d\n", array[c]);
   return 0;
}
```

OUTPUT:

```
Enter number of elements in array
5
Enter 5 elements
1
2
3
4
5
Enter the location where you wish to insert an element
3
Enter the value to insert
10
Resultant array is
1
2
10
3
4
5

--------------------------------
```

Q34. C program to delete an element in array at specified position

INPUT:

```
#include <stdio.h>
#define MAX_SIZE 100
int main()
{
   int arr[MAX_SIZE];
   int i, size, pos;
   printf("Enter size of the array : ");
   scanf("%d", &size);
   printf("Enter elements in array : ");
   for(i=0; i<size; i++) {
      scanf("%d", &arr[i]);   }
   printf("Enter the element position to delete : ");
   scanf("%d", &pos);
   if(pos < 0 || pos > size)   {
      printf("Invalid position! Please enter position between 1 to %d", size);  }
```

```
    else  {
        for(i=pos-1; i<size-1; i++){
            arr[i] = arr[i + 1];   }
        size--;
        printf("\nElements of array after delete are :
");
        for(i=0; i<size; i++)   {
            printf("%d\t", arr[i]);
        }
    }
    return 0;
}
```

OUTPUT:

```
Enter size of the array : 5
Enter elements in array : 1
2
3
4
5
Enter the element position to delete : 3

Elements of array after delete are : 1  2       4       5
--------------------------------
```

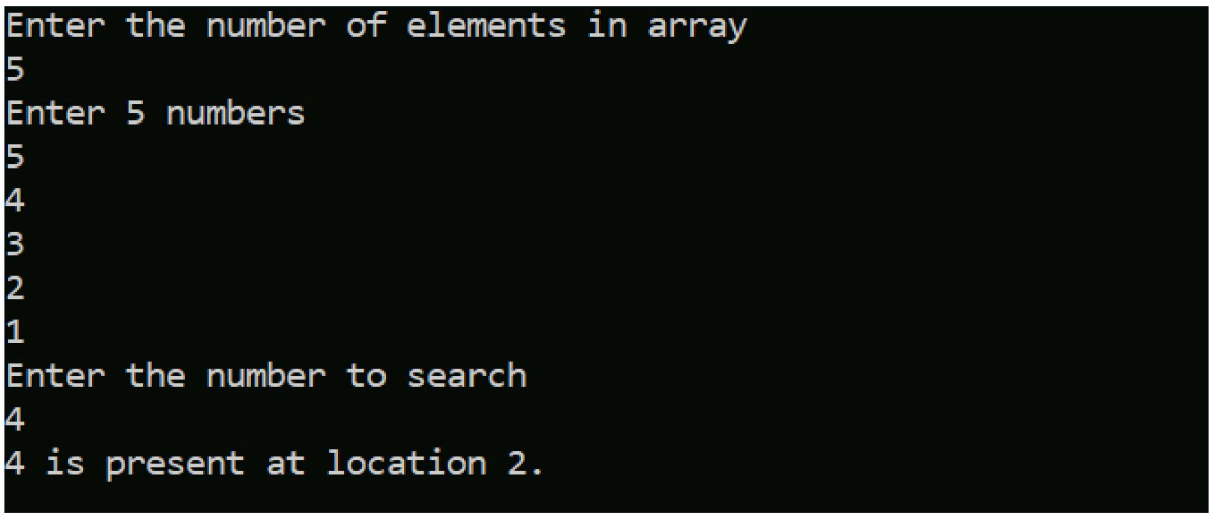
Q35. C program to search element in array using Linear Search

INPUT:

```
#include <stdio.h>
int main()
{
   int array[100], search, c, number;
   printf("Enter the number of elements in
array\n");
   scanf("%d",&number);
   printf("Enter %d numbers\n", number);
   for ( c = 0 ; c < number ; c++ )
      scanf("%d",&array[c]);
   printf("Enter the number to search\n");
   scanf("%d",&search);
   for ( c = 0 ; c < number ; c++ )
   {
      if ( array[c] == search )   /* if required
element found */
```

```
        {
            printf("%d is present at location %d.\n",
search, c+1);
            break;
        }
    }
    if ( c == number )
        printf("%d is not present in array.\n", search);
    return 0;
}
```

OUTPUT:



Q36. C program to find second largest number and Sorting Using Bubble sort in an array

INPUT:

```
 #include <stdio.h>
void main()
{
  int a[100],i,j,n,temp;
  printf ("Enter the number of elements");
  scanf ("%d",&n);
  printf("Enter the values");
  for (i=0;i<n;i++){
    scanf("%d",&a[i]);
  }
  for(i=0;i<n;i++)
  {
    for(j=i+1;j<n;j++)
   {
     if(a[i]>a[j])
```

```
   {
      temp = a[i];
      a[i]=a[j];
      a[j]=temp;
 }
  }
 }
    printf("Second largest element is %d",a[n-2]);
}
```

OUTPUT:

```
Enter the number of elements5
Enter the values1
2
3
4
5
Second largest element is 4
```

Q37. C program to count total number of duplicate elements in an array.

INPUT:

```
#include <stdio.h>
int main()
{
    int arr[10], i, j, Size, Count = 0;
    printf("\n Please Enter Number of elements in an array  :  ");
    scanf("%d", &Size);
    printf("\n Please Enter %d elements of an Array  :  ", Size);
    for (i = 0; i < Size; i++)
    {
    scanf("%d", &arr[i]);
    }

    for (i = 0; i < Size; i++)
    {
```

```
            for(j = i + 1; j < Size; j++)
            {
            if(arr[i] == arr[j])
            {
                  Count++;
                        break;}
            }
      }
      printf("\n Total Number of Duplicate Elements in this Array  =  %d ", Count);


      return 0;
}
```

OUTPUT:

```
 Please Enter Number of elements in an array  :   5

 Please Enter 5 elements of an Array  :  1
2
3
2
4

 Total Number of Duplicate Elements in this Array  =  1
```

Q38. C program to perform scalar matrix multiplication.

INPUT:

```
#include <stdio.h>
#define SIZE 3
int main(){
   int A[SIZE][SIZE];
   int num, row, col;
   printf("Enter elements in matrix of size %dx%d: \n", SIZE, SIZE);
   for(row=0; row<SIZE; row++)
   {
      for(col=0; col<SIZE; col++)
      {
         scanf("%d", &A[row][col]);
      }
   }
   printf("Enter any number to multiply with matrix A: ");
   scanf("%d", &num);
   for(row=0; row<SIZE; row++)  {
```

```
        for(col=0; col<SIZE; col++){
            A[row][col] = num * A[row][col];
        }
    }
    printf("\n Resultant matrix c.A = \n");
    for(row=0; row<SIZE; row++) {
        for(col=0; col<SIZE; col++){
            printf("%d ", A[row][col]); }
        printf("\n");
    }
    return 0;
}
```

OUTPUT:

```
Enter elements in matrix of size 3x3:
1
2
3
4
5
6
7
8
9
Enter any number to multiply with matrix A: 5

Resultant matrix c.A =
5 10 15
20 25 30
35 40 45
```

Q39. C program to find sum of main diagonal elements of a matrix.

INPUT:

```
#include<stdio.h>
int main()
{
   int m,n,i,j,sum=0;
   int a[100][100];
   printf("enter the size");
   scanf("%d%d",&m,&n);
   for(i=0;i<m;i++){
      for(j=0;j<n;j++){
         printf("enter elements");
         scanf("%d",&a[i][j]);
      }
   }
   for(i=0;i<m;i++){
      for(j=0;j<n;j++){
         if(i==j){
            sum+=a[i][j];
```

```
        }
      }
    }
    printf("sum of diagnal elements is %d",sum);
}
```

OUTPUT:

```
Enter elements in matrix of size 3x3:
1
2
3
4
5
6
7
8
9
Enter any number to multiply with matrix A: 5

Resultant matrix c.A =
5 10 15
20 25 30
35 40 45
```

Q40. C program to check sparse AND transpose matrix.

INPUT

```
#include <stdio.h>
int main() {
  int a[10][10], transpose[10][10], r, c;
  printf("Enter rows and columns: ");
  scanf("%d %d", &r, &c);
  printf("\n Enter matrix elements:\n");
  for (int i = 0; i < r; ++i)
  for (int j = 0; j < c; ++j) {
    printf("Enter element a %d  %d: ", i + 1, j + 1);
    scanf("%d", &a[i][j]);}
  printf("\n Entered matrix: \n");
  for (int i = 0; i < r; ++i)
  for (int j = 0; j < c; ++j) {
    printf("%d  ", a[i][j]);
    if (j == c - 1)
    printf("\n");  }
  for (int i = 0; i < r; ++i)
  for (int j = 0; j < c; ++j) {
    transpose[j][i] = a[i][j];  }
```

```
  printf("\n Transpose of the matrix:\n");
  for (int i = 0; i < c; ++i)
  for (int j = 0; j < r; ++j) {
    printf("%d  ", transpose[i][j]);
    if (j == r - 1)
    printf("\n");  }
  return 0;}
```

OUTPUT:

```
Enter rows and columns: 3
3

Enter matrix elements:
Enter element a11: 1
Enter element a12: 2
Enter element a13: 3
Enter element a21: 4
Enter element a22: 5
Enter element a23: 6
Enter element a31: 7
Enter element a32: 8
Enter element a33: 9

Entered matrix:
1  2  3
4  5  6
7  8  9

Transpose of the matrix:
1  4  7
2  5  8
3  6  9

--------------------------------
```

Q41. C program to check whether a matrix is Identity matrix or not

INPUT:

```
#include <stdio.h>
int main(){
   int A[SIZE][SIZE];
   int row, col, is Identity;
   printf("Enter elements in matrix of size 3x3: \n");
   for(row=0; row<SIZE; row++) {
      for(col=0; col<SIZE; col++){
         scanf("%d", &A[row][col]); }
   }
   Is Identity = 1;
   for(row=0; row<SIZE; row++) {
      for(col=0; col<SIZE; col++) {
         if(row==col && A[row][col]!=1)  {
            is Identity = 0; }
    else if(row!=col && A[row][col]!=0) {
            is Identity = 0;}
      }
   } if(is Identity == 1) {
      printf("\n The given matrix is an Identity Matrix.\n");
```

```
        for(row=0; row<SIZE; row++){
            for(col=0; col<SIZE; col++)
            {
                printf("%d ", A[row][col]);
            }
            printf("\n"); }
    }
    else
    {
        printf("The given matrix is not Identity Matrix");
    }
    return 0;
}
```

OUTPUT:

```
Enter elements in matrix of size 3x3:
1
2
3
4
1
5
6
7
1
The given matrix is not Identity Matrix
--------------------------------
```

Q42. C program to merge two sorted array in ascending order

INPUT:

```
#include <stdio.h>
#include <stdlib.h>
int main(void){
   int i, n, j, k;
   printf("Enter the size of the first array: ");
   scanf("%d", &n);
   int arr1[n];
   printf("Enter the elements of the first array: \n");
   for (i = 0; i < n; i++) {
      scanf("%d", &arr1[i]); }
   printf("Enter the size of the second array: ");
   scanf("%d", &k);
   int arr2[k];
   printf("Enter the elements of the second array: \n");
   for (j = 0; j < k; j++)  {
      scanf("%d", &arr2[j]);  }
   int arr3[n + k];
   i = j = 0;
   int in;
   for (in = 0; in < n + k; in ++) {
      if (i < n && j < k)  {
```

```
        if (arr1[i] < arr2[j])  {
            arr3[in] = arr1[i];
            i++;}
        else  {
            arr3[in] = arr2[j];
            j++; }  } else if (i < n) {
        arr3[in] = arr1[i];
        i++; } else    {
        arr3[in] = arr2[j];
        j++;}  }
    printf("The merged array is: \n");
    for (in = 0; in < n + k; in++) {
        printf("%d ", arr3[in]); }
    printf("\n");
    return 0;}
```

OUTPUT:

```
Enter the size of the first array: 4
Enter the elements of the first array:
1
2
3
4
Enter the size of the second array: 4
Enter the elements of the second array:
5
6
7
8
The merged array is:
1 2 3 4 5 6 7 8
```

Q43. C program to check whether a string is palindrome or not without Compare Function of String.

INPUT:

```
#include <stdio.h>
#include <string.h>
int main(){
  char input Array[100], reversed Array[100];
  printf("Enter the string for palindrome check \n");
  scanf("%s", input Array);
  strcpy(reversed Array, input Array);
  strrev(reversed Array);
  if(strcmp(input Array, reversed Array) == 0 )
    printf("%s is a palindrome.\n", input  Array);
  else
    printf("%s is not a palindrome.\n", input  Array);
  getch();
  return 0;
}
```

OUTPUT:

```
Enter the string for palindrome check
madam
madam is a palindrome.
```

Q44. C program to count frequency of each character in a string.

INPUT:

```
#include<stdio.h>
#include <string.h>
int main()
{
   char s[1000];
   int  i,j,k,count=0,n;
   printf("Enter  the string : ");
   gets(s);
   for(j=0;s[j];j++);
        n=j;
       printf(" frequency count character in string:\n");
   for(i=0;i<n;i++)
   {
       count=1;
       if(s[i])
       {
              for(j=i+1;j<n;j++)
           {
             if(s[i]==s[j])
```

```
        {
            count++;
            s[j]='\0';
            }
          }
          printf(" '%c' = %d \n",s[i],count);
     }
      }
   return 0;
}
```

OUTPUT:

```
Enter  the string : hello
 frequency count character in string:
 'h' = 1
 'e' = 1
 'l' = 2
 'o' = 1
```

Q45. C program to find diameter, circumference and area of a circle using functions.

INPUT:

```
#include <stdio.h>
int main()
{
   float radius, diameter, circumference, area;
   printf("Enter radius of circle: ");
   scanf("%f", &radius);
   diameter = 2 * radius;
   circumference = 2 * 3.14 * radius;
   area = 3.14 * (radius * radius);
   printf("Diameter of circle = %.2f units \n", diameter);
   printf("Circumference of circle = %.2f units \n",
circumference);
   printf("Area of circle = %.2f sq. units ", area);
   return 0;
}
```

OUTPUT:

```
Enter radius of circle: 2
Diameter of circle = 4.00 units
Circumference of circle = 12.56 units
Area of circle = 12.56 sq. units
```

Q46. C program to check prime, armstrong and perfect numbers using functions.

INPUT:

```
#include <stdio.h>
int checkPrimeNumber(int n);
int checkArmstrongNumber(int n);
int main() {
  int n, flag;
  printf("Enter a positive integer: ");
  scanf("%d", &n);
  flag = checkPrimeNumber(n);
  if (flag == 1)
    printf("%d is a prime number.\n", n);
  else
    printf("%d is not a prime number.\n", n);
  flag = checkArmstrongNumber(n);
  if (flag == 1)
    printf("%d is an Armstrong number.", n);
  else
    printf("%d is not an Armstrong number.", n);
  return 0;}
int checkPrimeNumber(int n) {
  int i, flag = 1, squareRoot;
  squareRoot = sqrt(n);
```

```
  for (i = 2; i <= squareRoot; ++i) {
    if (n % i == 0) {
      flag = 0;
      break;}}
  return flag;}
int check Armstrong Number(int num) {
  int original Num, remainder, n = 0, flag;
  double result = 0.0;
  for (original Num = num; original Num != 0; ++n) {
    original Num /= 10;}
  for (original Num = num; original Num != 0; original Num /= 10) {
    remainder = original Num % 10;
    result += pow(remainder, n); }
  if (round(result) == num)
    flag = 1;
  else
    flag = 0;
  return flag;
}
```

OUTPUT:

```
Enter a positive integer: 6
6 is not a prime number.
6 is an Armstrong number.
```

Q47. C program to add two number using pointers.

INPUT:

```
#include <stdio.h>
int main()
{
   int first, second, *p, *q, sum;
   printf("Enter two integers to add\n");
   scanf("%d%d", &first, &second);
   p = &first;
   q = &second;
   sum = *p + *q;
   printf("Sum of the numbers = %d\n", sum);
   return 0;
}
```

OUTPUT

```
Enter two integers to add
5
7
Sum of the numbers = 12
```

Q48. Swap 2 numbers using Call by Value AND Call by reference.

INPUT:

```
#include <stdio.h>
void swap(int, int);
int main(){
   int x, y;
   printf("Enter the value of x and y\n");
   scanf("%d%d",&x,&y);
   printf("Before Swapping\nx = %d\ny = %d\n", x, y);
   swap(x, y);
   printf("After Swapping\nx = %d\ny = %d\n", x, y);
   return 0;}void swap(int a, int b){
   int temp;
   temp = b;
   b = a;
   a = temp;
    printf("Values of a and b is %d  %d\n",a,b);
}
```

OUTPUT:

```
Enter the value of x and y
2
4
Before Swapping
x = 2
y = 4
Values of a and b is 4  2
After Swapping
x = 2
y = 4
```

Q49. C program to copy an array to another array AND reverse an array using pointers.

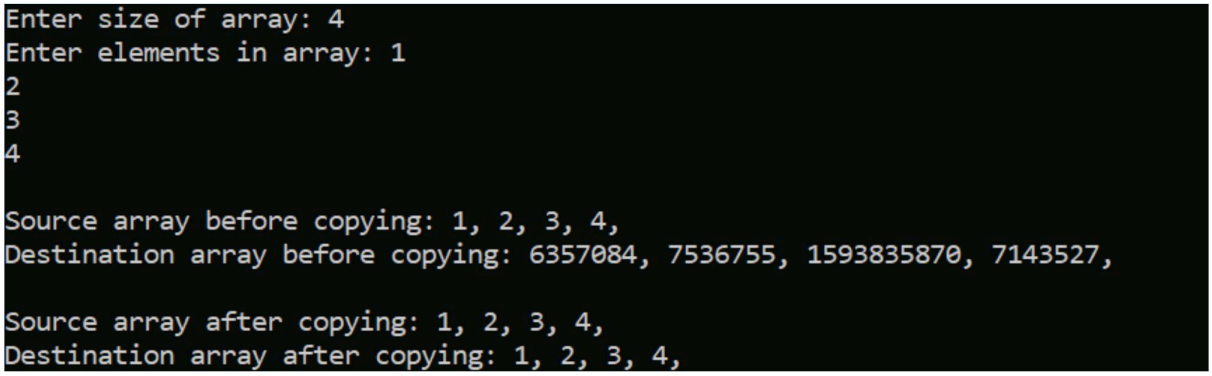
INPUT:

```
#include <stdio.h>
#define MAX_SIZE 100
void printArray(int arr[], int size);
int main()
{
    int source_arr[MAX_SIZE], dest_arr[MAX_SIZE];
    int size, i;
    int *source_ptr = source_arr;
    int *dest_ptr   = dest_arr;
    int *end_ptr;
    printf("Enter size of array: ");
    scanf("%d", &size);
    printf("Enter elements in array: ");
    for (i = 0; i < size; i++)
    {
        scanf("%d", (source_ptr + i));
    }
```

```
    end_ptr = &source_arr[size - 1];
    printf("\n Source array before copying: ");
    printArray(source_arr, size);
    printf("\n Destination array before copying: ");
    printArray(dest_arr, size);
    while(source_ptr <= end_ptr)
    {
        *dest_ptr = *source_ptr;
        source_ptr++;
        dest_ptr++;
    }
    printf("\n\n Source array after copying: ");
    printArray(source_arr, size);
    printf("\n Destination array after copying: ");
    printArray(dest_arr, size);
    return 0;
}
void printArray(int *arr, int size)
{
    int i;
```

```
    for (i = 0; i < size; i++)
    {
        printf("%d, ", *(arr + i));
    }
}
```

OUTPUT:



Q50. All Operations of String.

INPUT:

```
#include<stdio.h>
#include<conio.h>
void main(){
char string1[25],string2[25];
int l;
clrscr();
Printf("***** performing string length ******\n");
Printf("enter only one string \n");
Scanf("%s",string1);
l = strlen(string1);
printf("the string length is %d\n\n",l);
printf("**** performing string concatenation ****\n");
printf("enter two strings\n");
scanf("%s%s",string1,string2);
printf("the concatenated string is
%s\n\n",strcat(string1,string2));
printf("***** performing string compare *****\n");
printf("enter two strings \n");
scanf("%s%s",string1,string2);
if(strcmp(string1,string2) = = 0)
```

```
printf("strings are equal\n");
else
printf("strings are not equal\n");
printf("*** performing string copy ****\n");
printf("enter the two strings\n");
scanf("%d%d",string1,string2);
printf("the first string is %s and second string is
%s\n",string1,string2);
strcpy(string1,string2);
printf("the first string is %s and second string is
%s\n",string1,string2);
getch();}
```

OUTPUT:

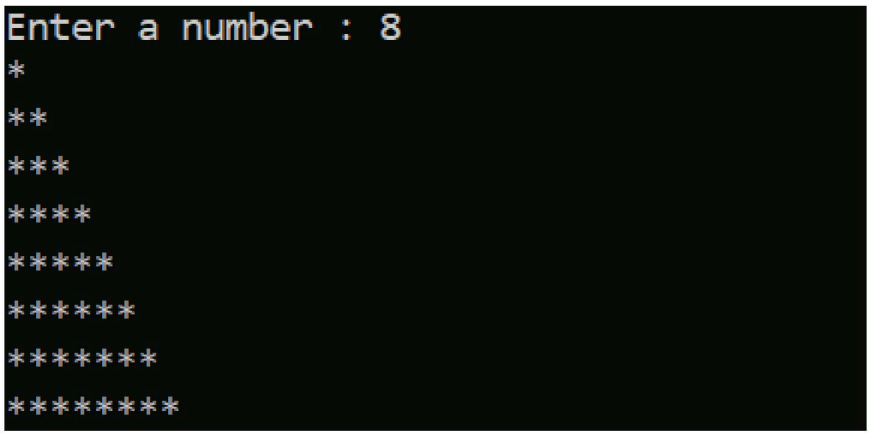
PATTERNS

Q1. C PROGRAM TO PRINT PATTERN OF RIGHT ANGLE TRIANGLE.

INPUT:

```
#include<stdio.h>
int main(){
    int n,i;
    printf("Enter a number : ");
    scanf("%d",&n);
    for (i=1; i<=n; i++) {
        for (int j=1; j<=i; j++){
            printf("*"); }
        printf("\n");   }
}
```

OUTPUT:



Q2. **C PROGRAM TO PRINT PATTERN OF COUNTINGS IN MATRIX FORM.**

INPUT:

```
#include<stdio.h>
int main(){
   int i,j,n;
   printf("Enter a number : ");
   scanf("%d",&n);
   for (i=1; i<=n; i++)  {
      for (j=1; j<=n; j++)   {
         printf("%d",i);
      }
      printf("\n"); }
}
```

OUTPUT:

```
Enter a number : 5
11111
22222
33333
44444
55555
```

Q3. **C PROGRAM TO PRINT PATTERN OF COUNTINGS IN MATRIX FORM.**

```
#include<stdio.h>
int main(){
   int i,j,n;
   printf("Enter a number : ");
   scanf("%d",&n);
   for (i=1; i<=n; i++)   {
      for (j=1; j<=n; j++)      {
         printf("%d",j);
      }
      printf("\n");
   }
}
```

OUTPUT:

```
Enter a number : 5
12345
12345
12345
12345
12345
```

Q4.C PROGRAM TO PRINT REVERSE TRIANGLE.

INPUT:

```
#include<stdio.h>
int main(){
int i,j, rows;
printf("Enter Rows = ")  ;
scanf("%d",&rows);
for(i = rows - 1; i > 0; i--) {
  for(j = 1; j <= rows - i; j++)   {
    printf(" ");   }
     for(j = 1; j <= i * 2 - 1; j++)      {
        printf("*");    }
  printf("\n");}
}
```

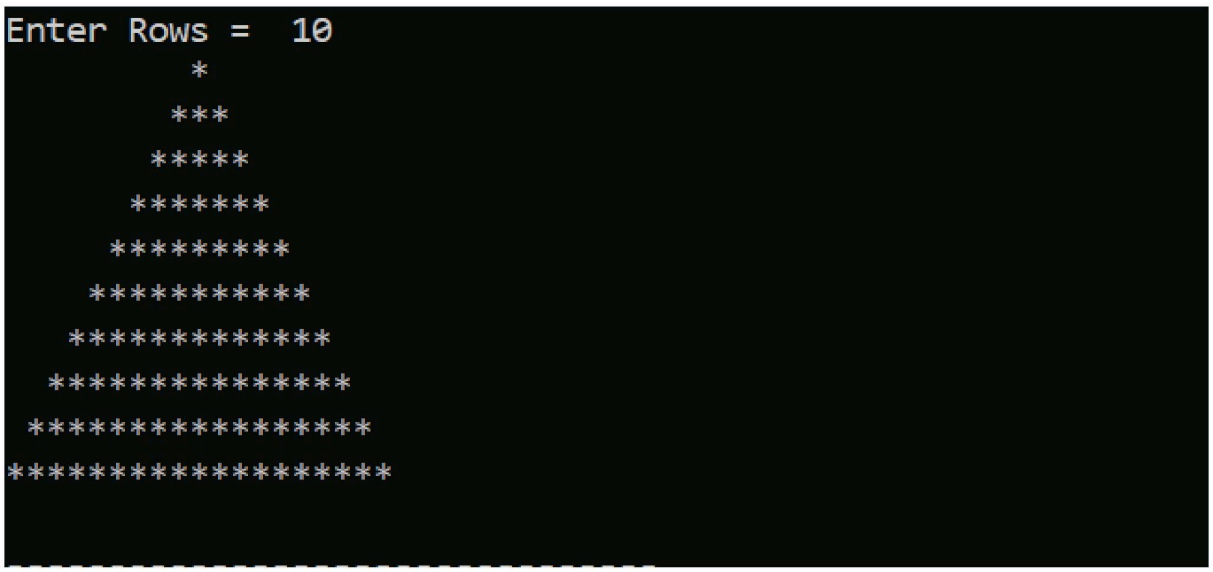
OUTPUT:

Q5.C PROGRAM TO PRINT TRIANGLE.

INPUT:

```
#include<stdio.h>
int main(){
        int i, j, rows;
        printf("Enter Rows =  ");
        scanf("%d", &rows);
        for(i = 1; i <= rows; i++){
                for(j = 1; j <= rows - i; j++){
                        printf(" ");        }
       for(j = 1; j <= i * 2 - 1; j++)   {
          printf("*"); }
                printf("\n");     }
 }
```

OUTPUT:



Q6.C PROGRAM TO PRINT PATTERN OF DIAMOND.

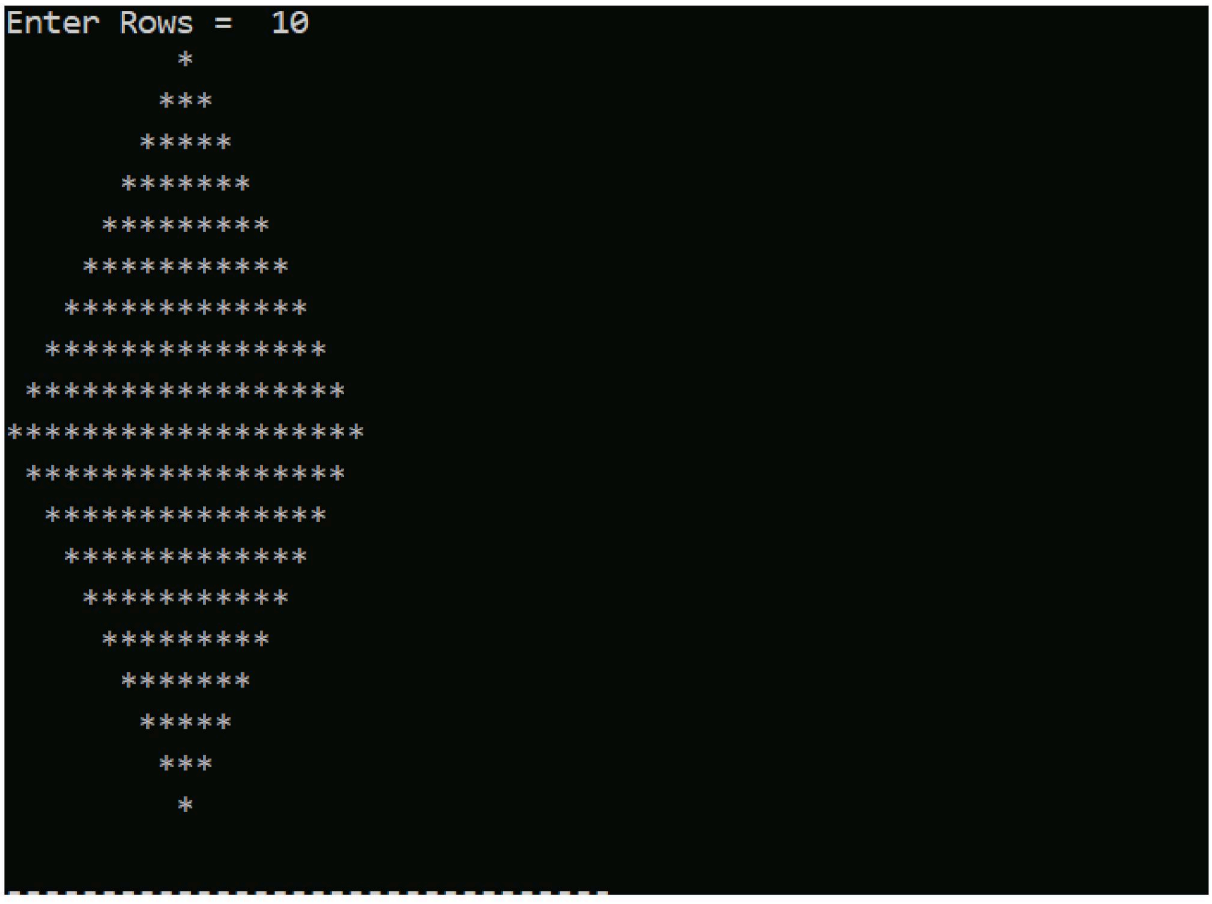
INPUT:

```
#include<stdio.h>
int main()
{
        int i, j, rows;
        printf("Enter Rows =  ");
        scanf("%d", &rows);
        for(i = 1; i <= rows; i++)
        {
                for(j = 1; j <= rows - i; j++)
                {
                        printf(" ");
                }
       for(j = 1; j <= i * 2 - 1; j++)
       {
          printf("*");
       }
                printf("\n");
        }

    for (i=rows-1; i>0; i--) {
```

```
    for (j=1; j<=rows-i; j++) {
      printf(" ");     }
    for (j=1; j<=i*2-1; j++)
    {
      printf("*");
    }
    printf("\n");
   }
 }
```

OUTPUT:



Q7.C PROGRAM TO PRINT PATTERN OF REVERSE RIGHT ANGLE TRIANGLE

INPUT:

```
#include<stdio.h>
int main(){
   int n;
   printf("Enter a number : ");
   scanf("%d",&n);
   for(int i=1; i<=n; i++)  {
      for (int j=n; j>=i; j--) {
         printf("*")    }
      printf("\n");
   }
}
```

OUTPUT:

```
Enter a number : 10
**********
*********
********
*******
******
*****
****
***
**
*
```

Q8.C PROGRAM TO PRINT THE PATTERN OF TRIANGLE IN NUMERIC FORM.

INPUT:

```
#include<stdio.h>
int main(){
    int i,j,n;
    printf("Enter a number : ");
    scanf("%d",&n);
    for (i=1; i<=n; i++) {
        for (j=1; j<=i; j++)     {
            printf("%d",i);   }
        printf("\n"); }
}
```

OUTPUT:

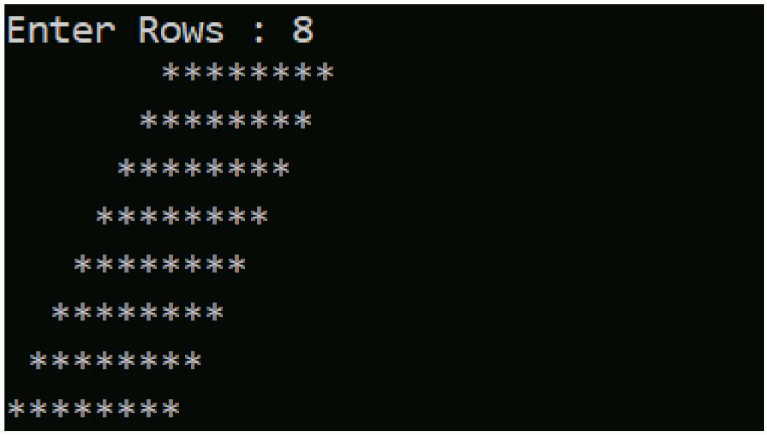
```
Enter a number : 10
1
22
333
4444
55555
666666
7777777
88888888
999999999
10101010101010101010
```

Q9.C PROGRAM TO PRINT PATTERN OF RHOMBUS.

INPUT:

```
#include <stdio.h>
int main(){
    int i, j, n;
    printf("Enter Rows : ");
    scanf("%d", &n);
    for(i=1; i<=n; i++){
        for(j=1; j<=n-i; j++){
            printf(" ");}
        for(j=1; j<=n; j++){
            printf("*");}
        printf("\n"); }
    return 0;
}
```

OUTPUT:



Q10.C PROGRAM TO PRINT THE PATTERN OF A LOGO.

INPUT:

```
#include <stdio.h>
int main(){
    int i, j, n;
    printf("Enter rows: ");
    scanf("%d", &n);
    for(i=1; i<=n; i++){
        for(j=1; j<=i; j++)     {
            printf("*"); }
        for(j=i*2; j<n*2; j++)
{
            printf(" "); }
        for(j=i; j>=1; j--)
  {
            printf("*");
 }
   printf("\n");
    }
}
```

OUTPUT: