Module 2:

Overview of c programing

1).Research and provide three real-world applications where C programming is extensively used, such as in embedded systems, operating systems, or game development.

=>C programming is a foundational language that is used in real-world applications due to its performance, and low-level capabilities.

1. Embedded Systems

=>Example Applications: Microcontrollers

=>C is popular in systems because it provides low-level access to hardware, allowing manipulation of memory and system resources.

=>Real-World Example: Automotive control systems for managing engine functions, sensors, and displays in modern cars.

2. Operating Systems

=>Example Applications: Linux, Windows kernel.

=>Operating systems require direct access to the hardware and memory management, which is facilitated by C's low-level programming features.

Real-World Example: Linux kernel, which is provides a powerful open-source operating system that is used in a variety of devices, from smartphone.

3. Game Development

=>Example Applications: Game engines, high-performance 3D graphics.

=>C allows for the development of resource applications, such as 3D graphics engines.

=>Real-World Example: The development of the original game engines like the many console games that require a high level of performance.

2).Install a C compiler on your system and configure the IDE. Write your first program to print "Hello, World!" and run it.

=>Install a C Compiler :

* Download and install MinGW to get the GCC compiler.
* Go to the [MinGW website](http://www.mingw.org/) and download.
* After installation, add the bin folder (e.g., C:\MinGW\bin) to your System PATH:
  + Right-click on This PC → Properties → Advanced system settings → Environment Variables.
  + Under System Variables, find Path and click Edit.
  + Add C:\MinGW\bin to the path list, then click OK.

=> Write your first program to print "Hello, World!"

=>#include <stdio.h>

int main()

{

printf("Hello, World!\n");

return 0;

}

Output:= Hello, World!

3).Write a C program that includes variables, constants, and comments. Declare and use different data types (int, char, float) and display their values.

=> #include<stdio.h>

#define pi 3.14

int main()

{

int a=10;

char c='m';

float f=1.25;

//dispay their values.

printf("\n Value of a is %d= ",a);

printf("\n Value of b is %c= ",c);

printf("\n Value of c is %.2f= ",f);

printf("\n value of pi is %.2f= ",pi);

return 0;

}

Output:=

Value of a is = 10

Value of b is = m

Value of c is = 1.250

value of pi is = 3.14

4). Write a C program that accepts two integers from the user and performs arithmetic, relational, and logical operations on them. Display the results.

=> #include<stdio.h>

int main()

{

int n1,n2,sum=0;

printf("Enter the first number = ");

scanf("%d",&n1);

printf("Enter the second number = ");

scanf("%d",&n2);

//arithmetic operation

printf("\nSum is %d and %d is = %d",n1,n2,n1+n2);

printf("\nSub is %d and %d is = %d",n1,n2,n1-n2);

printf("\nMul is %d and %d is = %d",n1,n2,n1\*n2);

printf("\nDiv is %d and %d is = %d\n",n1,n2,n1/n2);

//relational operation

n1>n2 ? printf("\n%d is gretest number",n1):printf("\n%d is gretest number",n2);

n1==n2 ? printf("\n%d and %d is equal number",n1,n2):printf("\n%d and %d is not equal number",n1,n2);

n1!=n2 ? printf("\n%d and %d is not equal number",n1,n2):printf("\n%d and %d is equal number",n1,n2);

n1<n2 ? printf("\n%d is gretest number\n",n2):printf("\n%d is gretest number\n",n1);

//logical operation

if(n1>0 && n2>0)

{

printf("\nboth number is a positive");

}

else

{

printf("\none of the number is not a positive");

}

if(n1>0 || n2>0)

{

printf("\none of the numnber is a positive");

}

else

{

printf("\nboth number is not a negative",n1,n2);

}

}

Output:

=> Enter the first number = 50

=>Enter the second number = 20

//arithmetic:=

Sum is 50 and 20 is = 70

Sub is 50 and 20 is = 30

Mul is 50 and 20 is = 1000

Div is 50 and 20 is = 2

//relational:=

50 is gretest number

50 and 20 is not equal number

50 and 20 is not equal number

50 is gretest number

//logical:=

both number is a positive

one of the numnber is a positive

5). Write a C program to check if a number is even or odd using an if-else statement. Extend the program using a switch statement to display the month name based on the user’s input (1 for January, 2 for February, etc.).

=> #include<stdio.h>

int main()

{

int num,month;

printf("Enter the number = ");

scanf("%d",&num);

if(num%2 == 0)

{

printf("\n%d is even number",num);

}

else

{

printf("\n%d is not even number",num);

}

printf("\nEnter your month choice(1 to 12) = ");

scanf("%d",&month);

switch(month)

{

case 1:printf("\nMonth is january");

break;

case 2:printf("\nMonth is february");

break;

case 3:printf("\nMonth is march");

break;

case 4:printf("\nMonth is april");

break;

case 5:printf("\nMonth is may");

break;

case 6:printf("\nMonth is june");

break;

case 7:printf("\nMonth is july");

break;

case 8:printf("\nMonth is august");

break;

case 9:printf("\nMonth is saptembar");

break;

case 10:printf("\nMonth is october");

break;

case 11:printf("\nMonth is november");

break;

case 12:printf("\nMonth is december");

break;

default:printf("\nMonth is invalid please enter right");

}

return 0;

}

Output:

=> Enter the number = 10

10 is even number.

Enter your month choice(1 to 12) = 10

Month is october.

6).Write a C program to print numbers from 1 to 10 using all three types of loops (while, for, do-while).

=> #include<stdio.h>

int main()

{

int i;

printf("\nWhile loop = ");

i=1;

while(i<=10)

{

printf("\n%d",i);

i++;

}

printf("\nFor loop = ");

for(i=1;i<=10;i++)

{

printf("\n%d",i);

}

printf("\nDo While loop = ");

i=1;

do

{

printf("\n%d",i);

i++;

}while(i<=10);

}

Output:

=> While loop = 1 2 3 4 5 6 7 8 9 10

For loop = 1 2 3 4 5 6 7 8 9 10

Do While loop = 1 2 3 4 5 6 7 8 9 10

7).Write a C program that uses the break statement to stop printing numbers when it reaches 5. Modify the program to skip printing the number 3 using the continue statement.

=> #include<stdio.h>

int main()

{

int i,num;

printf("\nEnter the number = ");

scanf("%d",&num);

for(i=1;i<=num;i++)

{

if(i%5==0)

{

break;

}

printf("%d",i);

}

printf("\nEnter the number = ");

scanf("%d",&num);

for(i=1;i<=num;i++)

{

if(i%3==0)

{

continue;

}

printf("%d",i);

}

return 0;

}

Output:

=> Enter the number = 8

1234

=>Enter the number = 8

124578

8).Write a C program that calculates the factorial of a number using a function. Include function declaration, definition, and call.

#include<stdio.h>

int facto(int num)

{

int i,fact=1;

for(i=1;i<=num;i++)

{

fact = fact \* i;

}

return fact;

}

int main()

{

int num;

printf("\nEnter the number = ");

scanf("%d",&num);

int fact=facto(num);

printf("\n%d number factorial is = %d",num,fact);

}

Output:=

Enter the number = 5

5 number factorial is = 120

9) Write a C program that stores 5 integers in a one-dimensional array and prints them. Extend this to handle a two-dimensional array (3x3 matrix) and calculate the sum of all elements.

=>#include<stdio.h>

int main()\

{

int arr[10],num,i;

printf("\nEnter the number = ");

scanf("%d",&num);

for(i=0;i<num;i++)

{

printf("\nEnter the number %d = ",i+1);

scanf("%d",&arr[i]);

}

for(i=0;i<num;i++)

{

printf("%d ",arr[i]);

}

int arr1[10][10],j,sum=0;

printf("\nEnter the number = ");

scanf("%d",&num);

for(i=0;i<num;i++)

{

for(j=0;j<num;j++)

{

printf("\nEnter the number [%d][%d] = ",i+1,j+1);

scanf("%d",&arr1[i][j]);

}

}

for(i=0;i<num;i++)

{

for(j=0;j<num;j++)

{

printf("%d",arr1[i][j]);

}

}

for(i=0;i<num;i++)

{

for(j=0;j<num;j++)

{

sum = sum + arr1[i][j];

}

}

printf("sum is = %d",sum);

}

Output:=

Enter the number = 4

Enter the number 1 = 1

Enter the number 2 = 2

Enter the number 3 = 3

Enter the number 4 = 4

1 2 3 4

Enter the number = 2

Enter the number [1][1] = 1

Enter the number [1][2] = 2

Enter the number [2][1] = 3

Enter the number [2][2] = 4

=>1 2 3 4

=>sum is = 10

10).Write a C program to demonstrate pointer usage. Use a pointer to modify the value of a variable and print the result.

#include<stdio.h>

int main()

{

int num=50;

int \*ptr;

printf("\nOriginal value of num = %d",num);

ptr = &num;

\*ptr = 100;

printf("\nModified value of num = %d",num);

}

Output:=

Original value of num = 50

Modified value of num = 100

11).Write a C program that takes two strings from the user and concatenates them using strcat(). Display the concatenated string and its length using strlen().

=> #include<stdio.h>

int main()

{

char str1[10],str2[10];

printf("\nEnter the first string = ");

gets(str1);

printf("\nEnter the second string = ");

gets(str2);

printf("\nOriginal value of first string = %s",str1);

printf("\nOriginal value of second string = %s",str2);

strcat(str1,str2);

int len =strlen(str1);

printf("\nChanging value of first string = %s",str1);

printf("\nlength value of third string = %d",len);

printf("\nChanging value of second string = %s",str2);

}

Output:=

=> Enter the first string = mon

=>Enter the second string = ak

Original value of first string = mon

Original value of second string = ak

Changing value of first string = monak

length value of third string = 5

Changing value of second string = ak

EXTRA LAB EXERCISES FOR IMPROVING PROGRAMMING LOGIC:

1).Write a C program that acts as a simple calculator. The program should take two numbers and an operator as input from the user and perform the respective operation (addition, subtraction, multiplication, division, or modulus) using operators. • Challenge: Extend the program to handle invalid operator inputs.

#include<stdio.h>

int main()

{

int n1,n2,choice,ans;

printf("\nEnter the number n1 = ");

scanf("%d",&n1);

printf("\nEnter the number n2 = ");

scanf("%d",&n2);

printf("\n1.+");

printf("\n2.-");

printf("\n3./");

printf("\n4.\*");

printf("\nEnter any choice = ");

scanf("%d",&choice);

switch(choice)

{

case 1:

ans = n1 + n2;

printf("\nSub of two number is = %d",ans);

break;

case 2:

ans = n1 - n2;

printf("\nSub of two number is = %d",ans);

break;

case 3:

ans = n1 / n2;

printf("\nSub of two number is = %d",ans);

break;

case 4:

ans = n1 \* n2;

printf("\nSub of two number is = %d",ans);

break;

default:

printf("Error! Invalid operator. Please enter: +, -, \*, /, %%.\n");

}

}

Output:=

=> Enter the number n1 = 100

Enter the number n2 = 50

1.+

2.-

3./

4.\*

Enter any choice = 1

Sub of two number is = 150

2).Write a C program that takes an integer from the user and checks the following using different operators: o Whether the number is even or odd. o Whether the number is positive, negative, or zero. o Whether the number is a multiple of both 3 and 5.

=> #include<stdio.h>

int main()

{

int n1;

printf("\nEnter the number of n1 = ");

scanf("%d",&n1);

if(n1%2==0)

{

printf("\n%d is even number ",n1);

}

else

{

printf("\n%d is odd number ",n1);

}

if(n1>0)

{

printf("\n%d is positive number ",n1);

}

else if(n1<0)

{

printf("\n%d is nagative number ",n1);

}

else

{

printf("\n%d is zero number ",n1);

}

if(n1%3==0&&n1%5==0)

{

printf("\n%d is multiple both number ",n1);

}

else

{

printf("\n%d is not multiple both number ",n1);

}

}

Output:=

Enter the number of n1 = 15

15 is odd number

15 is positive number

15 is multiple both number

3).Write a C program that takes the marks of a student as input and displays the corresponding grade based on the following conditions: o Marks > 90: Grade A o Marks > 75 and <= 90: Grade B o Marks > 50 and <= 75: Grade C o Marks <= 50: Grade D • Use if-else or switch statements for the decision-making process.

=> #include<stdio.h>

int main()

{

int marks,cat;

printf("\nEnter the number n1 = ");

scanf("%d",&marks);

if(marks>90)

{

cat = 1;

}

else if(marks>75&&marks<=90)

{

cat = 2;

}

else if(marks>50&&marks<=75)

{

cat = 3;

}

else if(marks<=50)

{

cat = 4;

}

switch(cat)

{

case 1:

printf("grade A");

break;

case 2:

printf("grade B");

break;

case 3:

printf("grade C");

break;

case 4:

printf("grade D");

break;

}

}

Output:=

=> Enter the number n1 = 95

grade A

4).Write a C program that takes three numbers from the user and determines: o The largest number. o The smallest number. • Challenge: Solve the problem using both if-else and switch-case statements.

=> #include<stdio.h>

int main()

{

int n1,n2,n3;

printf("Enter the first element = ");

scanf("%d",&n1);

printf("Enter the second element = ");

scanf("%d",&n2);

printf("Enter the third element = ");

scanf("%d",&n3);

if(n1>n2)

{

if(n1>n3)

{

printf("\n%d is largest number ",n1);

}

else

{

printf("\n%d is largest number ",n3);

}

}

else

{

if(n2>n3)

{

printf("\n%d is largest number ",n2);

}

else

{

printf("\n%d is largest number ",n3);

}

}

if(n1<n2&&n1<n3)

{

printf("\n%d is smallest number ",n1);

}

else if(n2<n1&&n2<n3)

{

printf("\n%d is smallest number ",n2);

}

else

{

printf("\n%d is smallest number ",n3);

}

}

Output:=

Enter the first element = 10

Enter the second element = 5

Enter the third element = 15

15 is largest number

5 is smallest number

5).Write a C program that checks whether a given number is a prime number or not using a for loop.

#include<stdio.h>

int main()

{

int i,a[50],n,flag=1,j;

printf("\nEnter the numuber of element = ");

scanf("%d",&n);

for(i=0;i<n;i++)

{

printf("\nEnter the element of %d = ",i+1);

scanf("%d",&a[i]);

}

for(i=0;i<n;i++)

{

flag=1;

for(j=2;j<a[i];j++)

{

if(a[i]%j==0)

{

flag=0;

}

}

if(flag==1)

{

printf("\n%d",a[i]);

}

}

}

Output:=

Enter the numuber of element = 10

Enter the element of 1 = 12

Enter the element of 2 = 5

Enter the element of 3 = 7

Enter the element of 4 = 6

Enter the element of 5 = 5

Enter the element of 6 = 28

Enter the element of 7 = 9

Enter the element of 8 = 2

Enter the element of 9 = 4

Enter the element of 10 = 1

5

7

5

2

1

7 is prime number

6). Write a C program that takes an integer input from the user and prints its multiplication table using a for loop. • Challenge: Allow the user to input the range of the multiplication table (e.g., from 1 to N).

=> #include<stdio.h>

int main()

{

int i,n,num;

printf("\nEnter the number = ");

scanf("%d",&num);

printf("\nEnter the number of element = ");

scanf("%d",&n);

for(i=1;i<=n;i++)

{

printf("\n %d \* %d = %d",num,i,num\*i);

}

}

Output:=

=> Enter the number = 10

Enter the number of element = 9

10 \* 1 = 10

10 \* 2 = 20

10 \* 3 = 30

10 \* 4 = 40

10 \* 5 = 50

10 \* 6 = 60

10 \* 7 = 70

10 \* 8 = 80

10 \* 9 = 90

7).Write a C program that takes an integer from the user and calculates the sum of its digits using a while loop. • Challenge: Extend the program to reverse the digits of the number.

=>#include<stdio.h>

int main()

{

int num,sum=0,rem;

printf("\nEnter the number of element = ");

scanf("%d",&num);

while(num!=0)

{

rem = num % 10;

sum = sum + rem;

num = num/10;

}

printf("\nSum is = %d",sum);

int temp = num,rev;

while(temp!=0)

{

rem = temp % 10;

rev = (rev \* 10)+rem;

temp = temp/10;

}

printf("\nReverse is = %d",temp);

}

Output:=

=>

8).Write a C program that accepts 10 integers from the user and stores them in an array. The program should then find and print the maximum and minimum values in the array. • Challenge: Extend the program to sort the array in ascending order.

=>#include<stdio.h>

int main()

{

int arr[100],n,i,min,max;

printf("\nEnter the number of element");

scanf("%d",&n);

for(i=0;i<n;i++)

{

printf("\nEnter the number %d = ",i+1);

scanf("%d",&arr[i]);

}

max=arr[0];

min=arr[0];

for(i=0;i<n;i++)

{

if(min>arr[i])

{

min = arr[i];

}

if(max<arr[i])

{

max = arr[i];

}

}

printf("\nMax value is = %d",max);

printf("\nMin value is = %d\n",min);

printf("\nAssending order := ");

int j;

for(i=0;i<n;i++)

{

for(j=i+1;j<n;j++)

{

if(arr[i]>arr[j])

{

int temp = arr[i];

arr[i] = arr[j];

arr[j] = temp;

}

}

}

for(i=0;i<n;i++)

{

printf("%d",arr[i]);

}

}

Output:=

=>Enter the number of element5

Enter the number 1 = 1

Enter the number 2 = 2

Enter the number 3 = 3

Enter the number 4 = 4

Enter the number 5 = 5

Max value is = 5

Min value is = 1

Assending order := 12345

9).Write a C program that accepts two 2x2 matrices from the user and adds them. Display the resultant matrix. • Challenge: Extend the program to work with 3x3 matrices and matrix multiplication.

=>#include<stdio.h>

int main()

{

int arr1[100][100],arr2[100][100],n1,n2,i,j;

printf("\nEnter the n1 element = ");

scanf("%d",&n1);

for(i=0;i<n1;i++)

{

for(j=0;j<n1;j++)

{

printf("\nENter the number %d = ",i+1);

scanf("%d",&arr1[i][j]);

}

}

printf("\nEnter the n2 element = ");

for(i=0;i<n1;i++)

{

for(j=0;j<n1;j++)

{

printf("\nENter the number %d = ",i+1);

scanf("%d",&arr2[i][j]);

}

}

printf("\nAddition is = \n");

int sum[10][10];

for(i=0;i<n1;i++)

{

for(j=0;j<n1;j++)

{

sum[i][j] = arr1[i][j] + arr2[i][j];

}

}

for(i=0;i<n1;i++)

{

for(j=0;j<n1;j++)

{

printf("%d ",sum[i][j]);

}

printf("\n");

}

}

Output:=

=>Enter the n1 element = 3

ENter the number 1 = 1

ENter the number 1 = 2

ENter the number 1 = 3

ENter the number 2 = 4

ENter the number 2 = 5

ENter the number 2 = 6

ENter the number 3 = 7

ENter the number 3 = 8

ENter the number 3 = 9

Enter the n2 element =

ENter the number 1 =

9

ENter the number 1 = 8

ENter the number 1 = 7

ENter the number 2 = 6

ENter the number 2 = 5

ENter the number 2 = 4

ENter the number 3 = 3

ENter the number 3 = 2

ENter the number 3 = 1

Addition is =

10 10 10

10 10 10

10 10 10

10).Write a C program that takes N numbers from the user and stores them in an array. The program should then calculate and display the sum of all array elements. • Challenge: Modify the program to also find the average of the numbers.

=> #include<stdio.h>

int main()

{

int arr1[100],n,i,sum=0;

printf("\nEnter the n number = ");

scanf("%d",&n);

for(i=0;i<n;i++)

{

printf("\nEnter the number %d = ",i+1);

scanf("%d",&arr1[i]);

}

for(i=0;i<n;i++)

{

sum = sum + arr1[i];

}

printf("\nSum of all number is = %d",sum);

printf("\nAvg of all number is = %.2f",(float)sum/(float)n);

}

Output:=

=> Enter the n number = 5

Enter the number 1 = 1

Enter the number 2 = 2

Enter the number 3 = 3

Enter the number 4 = 4

Enter the number 5 = 5

Sum of all number is = 15

Avg of all number is = 3.00

11).Write a C program that generates the Fibonacci sequence up to N terms using a recursive function. • Challenge: Modify the program to calculate the Nth Fibonacci number using both iterative and recursive methods. Compare their efficiency.

=> #include<stdio.h>

int fibb(int terms)

{

int i,m=0,n=1,k;

printf("\n%d %d",m,n);

for(i=0;i<terms-2;i++)

{

k = m + n;

printf("%d ",k);

m = n;

n = k;

}

}

int main()

{

int terms;

printf("\nEnter the numbert of terms = ");

scanf("%d",&terms);

fibb(terms);

return 0;

}

Output:=

=> Enter the numbert of terms = 8

Fibbonacci series is = 0 1 1 2 3 5 8 13

12).Write a C program that calculates the factorial of a given number using a function.

=> #include<stdio.h>

void fact(int num)

{

int i,fact=1;

for(i=1;i<=num;i++)

{

fact = fact \* i;

}

printf("\nthe factorial of %d is %d",num,fact);

}

int main()

{

int num;

printf("Enter the number:=");

scanf("%d",&num);

fact(num);

}

Output:=

=> Enter the number:=5

the factorial of 5 is 120

13).Write a C program that takes a number as input and checks whether it is a palindrome using a function. • Challenge: Modify the program to check if a given string is a palindrome.

=>#include<stdio.h>

void palindrome(int num)

{

int i,rem;

int copy = num;

int temp = num;

while(num!=0)

{

rem = num % 10;

temp = (temp\*10)+rem;

num = num/10;

}

if(copy==temp)

{

printf("\n%d is palindrome number ",copy);

}

else

{

printf("\n%d is not palindrome number ",copy);

}

}

int main()

{

int num;

printf("\nEnter the number = ");

scanf("%d",&num);

palindrome(num);

return 0;

}

Output:=

=> Enter the number:=121

121 is palindrome number

14). Write a C program that takes a string as input and reverses it using a function. • Challenge: Write the program without using built-in string handling functions.

=> #include<stdio.h>

void rev(char str[])

{

int i,len=0;

for(i=0;str[i]!='\0';i++)

{

len++;

}

for(i=len-1;i>=0;i--)

{

printf("%c",str[i]);

}

}

int main()

{

char str[100];

printf("\nEnter the value in str1 = ");

gets(str);

rev(str);

return 0;

}

Output:=

=> Enter the value in str1 = monak

=> Kanom

15).Write a C program that takes a string from the user and counts the number of vowels and consonants in the string. • Challenge: Extend the program to also count digits and special characters.

=> #include<stdio.h>

void vowel(char ch[])

{

int i,j=0,k=0;

int vowel=0,consonant=0;

char ch2[10],ch3[10];

for(i=0;ch[i]!='\0';i++)

{

if(ch[i]=='a'||ch[i]=='e'||ch[i]=='i'||ch[i]=='o'||ch[i]=='u'||ch[i]=='A'||ch[i]=='E'||ch[i]=='I'||ch[i]=='O'||ch[i]=='U')

{

vowel++;

ch2[j] = ch[i];

j++;

}

else

{

consonant++;

ch3[k] = ch[i];

k++;

}

}

printf("\nVowel number is = %d",vowel);

printf("\nConsonant number is = %d",consonant);

printf("\nVowel string is = %s",ch2);

printf("\nConsonant string is = %s",ch3);

}

int main()

{

char str1[100];

printf("\nEnter the value in str1 = ");

gets(str1);

vowel(str1);

return 0;

}

Output:=

=> Enter the value in str1 = MONank

Vowel number is = 2

Consonant number is = 4

Vowel string is = Oa

Consonant string is = MNnk

16).Write a C program that counts the number of words in a sentence entered by the user. • Challenge: Modify the program to find the longest word in the sentence.

=> #include<stdio.h>

void word(char str1[])

{

int i,word=1;

for(i=0;str1[i]!='\0';i++)

{

if(str1[i] == ' ')

{

word++;

}

}

printf("\nNumber of words = %d",word);

}

int main()

{

char str1[100];

printf("\nEnter the value in str1 = ");

gets(str1);

words(str1);

return 0;

}

Output:=

=> Enter the str = monak dholariya

Original value of str = monak dholariya

Number of words = 2

17).Write a C program that checks whether a given number is an Armstrong number or not (e.g., 153 = 1^3 + 5^3 + 3^3). • Challenge: Write a program to find all Armstrong numbers between 1 and 1000.

=> #include<stdio.h>

int main()

{

int num,digit=0,rem,power,sum=0,i;

printf("Enter the number:=");

scanf("%d",&num);

int temp=num;

int copy=num;

while(num!=0)

{

num = num/10;

digit++;

}

for(i=1;i<=digit;i++)

{

rem = temp % 10;

power = pow(rem,digit);

sum = sum + power;

temp = temp/10;

}

if(copy==sum)

{

printf("\n%d is an armstrong number",copy);

}

else

{

printf("\n%d is not an armstrong number",copy);

}

}

#include<stdio.h>

int main()

{

int i,num,rem,sum,n=1000;

for(i=1;i<=n;i++)

{

int sum=0;

int temp = i;

num = i;

while(num!=0)

{

rem = num % 10;

sum = sum + rem\*rem\*rem;

num = num/10;

}

if(temp==sum)

{

printf("\n%d",i);

}

}

}

Output:=

=> Enter the number:=153

153 is an armstrong number

=>Armstrong number between 1 to 1000:

1

153

370

371

407

18).Write a C program that generates Pascal’s Triangle up to N rows using loops.

=> #include<stdio.h>

int main()

{

int row,i,j,k,m;

printf("\nEnter the row number = ");

scanf("%d",&row);

int spc=row-1;

for(i=0;i<row;i++)

{

for(k=0;k<spc;k++)

{

printf(" ");

}

m=1;

for(j=0;j<i;j++)

{

printf("%d ",m);

m = m \* (i-j)/(j+1);

}

spc--;

printf("\n");

}

}

=> Enter the row number = 10

1

1 2

1 3 3

1 4 6 4

1 5 10 10 5

1 6 15 20 15 6

1 7 21 35 35 21 7

1 8 28 56 70 56 28 8

1 9 36 84 126 126 84 36 9

19).Write a C program that implements a simple number guessing game. The program should generate a random number between 1 and 100, and the user should guess the number within a limited number of attempts. • Challenge: Provide hints to the user if the guessed number is too high or too low.

=>

#include <stdio.h>

int main()

{

int N=100,number, guess, numberofguess = 0;

srand(time(NULL));

number = rand() % N;

printf("Guess a number between 1 and %d\n",N);

while (guess != number)

{

scanf("%d", &guess);

if (guess > number)

{

printf("Lower number please!\n");

numberofguess++;

}

else if (number > guess)

{

printf("Higher number"

" please!\n");

numberofguess++;

}

else

printf("You guessed the"

" number in %d "

"attempts!\n",

numberofguess);

if (numberofguess > 9) {

printf("\nYou Loose!\n");

break;

}

}

}

Output:=

=> Guess a number between 1 and 100

50

Lower number please!

30

Lower number please!

10

Lower number please!

5

Lower number please!

3

Lower number please!

2

You guessed the number in 5 attempts!

=>assignment is completed..