**Problem Solving**

**Problem 10: Write a c program to convert a integer(in seconds) to hours, minutes and seconds.**

#include <stdio.h>

int main(){

printf("Input seconds: ");

int seconds;

scanf("%d",&seconds);

int hour,minute,second;

hour= seconds/3600;

seconds= seconds%3600;

minute= seconds/60;

second= seconds%60;

printf("H:M:S - %d:%d:%d",hour,minute,second);

return 0;

}

**Brain Teaser:** **Beautiful value= Mirror number+10**

#include <stdio.h>

int main(){

printf("Input number: ");

int n;

scanf("%d",&n);

int digit1,digit2,digit3;

digit1=n/100;

n=n%100;

digit2=n/10;

digit3=n%10;

int mirror;

mirror=digit3\*100+digit2\*10+digit1;

printf("Mirror = %d\n",mirror);

printf("Beautiful value = %d\n",mirror+10);

return 0;}

**Conditonal Statement**

1. **Write a C program to accept two integers and check whether they are equal or not**.

#include <stdio.h>

int main(){

int num1,num2;

scanf("%d %d",&num1,&num2);

if(num1==num2){

printf("Number 1 & Number 2 are equal");

}

else{

printf("Number 1 & Number 2 are not equal");

}

return 0;

}

**2.Write a c program to accept a integer and check whether a number is even or odd**

#include <stdio.h>

int main(){

int num;

scanf("%d",&num);

if (num%2==0){

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

}

else {

printf("%d is an odd number",num);

}

return 0;

}

**3. Leap year**

#include <stdio.h>

int main(){

int year;

scanf("%d",&year);

if(year%400==0){

printf("Leap year");

}

else if((year%100!=0)&&(year%4==0)){

printf("Leap year");

}

else{

printf("Not a leap year");

}

return 0;

}

**5. Write a C program to find the largest of three numbers.**

**Test Data : 12 25 52**

**Expected Output :**

**1st Number = 12, 2nd Number = 25, 3rd Number = 52**

**The 3rd Number is the greatest among three**

#include <stdio.h >

int main (){

  int num1,num2,num3;

  scanf("%d %d %d",&num1,&num2,&num3);

  if((num1>num2)&&(num1>num3)){

       printf("Greatest number is = %d",num1);

  }

  else if(num2>num3){

       printf("Greatest number is = %d",num2);

  }

  else{

       printf("Greatest number is = %d",num3);

  }

  return 0;

}

**9. Write a C program to calculate the root of a quadratic equation.**

**Test Data : 1 5 7**

**Expected Output :**

**Root are imaginary;**

**No solution.**

#include <stdio.h>

#include <math.h>

int main(){

float a,b,c;

scanf("%f %f %f",&a,&b,&c);

float det=b\*b-4\*a\*c;

if(det==0){

printf("Roots are equal\n");

printf("x1=%f\n",-b/2\*a);

printf("x2=%f\n",-b/2\*a);

}

else if(det>0){

printf("Roots are real but not equal\n");

float x1=(-b+sqrt(det))/2\*a;

float x2=(-b-sqrt(det))/2\*a;

printf("x1=%f\n",x1);

printf("x2=%f\n",x2);

}

else{

printf("Roots are imaginary");

}

return 0;

}

**11. Write a C program to check whether a triangle is Equilateral, Isosceles or Scalene.**

**Test Data :**

**50 50 60**

**Expected Output :**

**This is an isosceles triangle.**

#include <stdio.h>

#include <math.h>

int main(){

int a,b,c;

scanf("%d %d %d",&a,&b,&c);

if((a==b)&&(b==c)){

printf("Equilateral");

}

else if((a==b)||(b==c)||(c==a)){

printf("Isosceles");

}

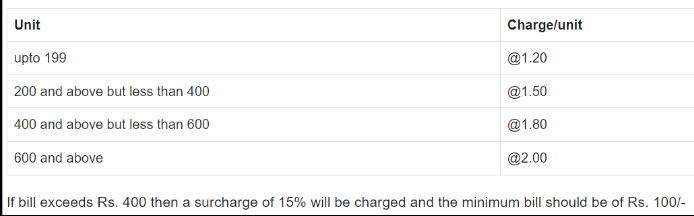
else{

printf("Scalene");

}

return 0;}

**12. Write a program in C to calculate and print the electricity bill of a given customer. unit consumed by the user should be captured from the keyboard to display the total amount to be paid to the customer. The charge are as follow :**

****

#include <stdio.h>

int main(){

float used\_unit;

scanf("%f",&used\_unit);

float unit\_charge;

if(used\_unit<200){

unit\_charge=1.2;

}

else if(used\_unit<400){

unit\_charge=1.5;

}

else if(used\_unit<600){

unit\_charge=1.8;

}

else{

unit\_charge=2;

}

printf("Unit consumed : %.2f\n",used\_unit);

printf("Amount charges @Rs %f per unit : %.2f\n",unit\_charge,used\_unit\*unit\_charge);

float total\_bill,surcharge;

total\_bill=used\_unit\*unit\_charge;

printf("Net amount paid by the customer : %.2f\n",total\_bill);

if(total\_bill>400){

surcharge=total\_bill\*.15;

printf("Surcharge amount : %.2f\n",surcharge);

total\_bill+=surcharge;

printf("Net amount paid by the customer : %.2f\n",total\_bill);

}

if(total\_bill<100){

printf("Net amount paid by the customer : 100\n");

}

return 0;

}

**Loop**

**1. Input integer n and print the number table of n upto 100**

#include <stdio.h>

#include <math.h>

int main(){

int n;

scanf("%d",&n);

for(int i=1;i<=100;i++){

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

}

return 0;

}

**2. Find sum from 1 to nth odd number**

#include <stdio.h>

#include <math.h>

int main(){

int n;

scanf("%d",&n);

int sum=0;

int odd=1;

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

sum+=odd;

odd+=2;

}

printf("%d",sum);

return 0;

}

**3. Factorial of a given number n( Input n )**

#include<stdio.h>

int main(){

int n;

printf("Enter a number: ");

scanf("%d",&n);

printf("Factorial of %d =",n);

int fact=1;

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

fact\*=i;

if(i<n) printf("%d \* ",i);

else printf("%d =",i);

}

printf("%d",fact);

return 0;

}

**4. Print 12+22+32+……+n2 (Input n)**

#include <stdio.h>

#include <math.h>

int main(){

int n;

scanf("%d",&n);

int sum=0;

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

**sum+ =i\*i**;

}

printf ("%d",sum);

return 0;

}

**5. Write a C Program calculate the sum Given Series until nth term .**

**(11+22+33+……+nn =?)**

#include <stdio.h>

#include <math.h>

int main(){

int n;

scanf("%d",&n);

int sum=0;

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

**sum += pow(i,i);**

}

printf ("%d",sum);

return 0;

}

**6**. Take input of n different number **and calculate the number of even and odd in those inputs.**

**Test Data :**

**Input :**

**5**

**4 3 5 1 6**

**Expected Output:**

**Even=2 and Odd=3**

#include <stdio.h>

#include <math.h>

int main(){

int n;

scanf("%d",&n);

int count\_even=0;

int count\_odd=0;

int x;

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

scanf("%d",&x);

if(x%2==0){

count\_even++;

}

else{

count\_odd++;

}

}

printf("Even=%d Odd=%d",count\_even,count\_odd);

return 0;

}

**7. How many digits in a number?**

#include <stdio.h>

#include <math.h>

int main(){

int n;

scanf("%d",&n);

int digit\_count=0;

int temp=n;

while(temp!=0){

temp/=10;

digit\_count++;

}

printf("%d",digit\_count);

return 0;

}

**8. Tonmoy likes beautiful value . Beautiful numbers are made by the sum of its all integer’s square value .Suppose if a number is 3204 then the beautiful value is 32+22+02+42= 29.Take a input of a integer and print the beautiful value .**

**Test Data 1:**

**Input : 3204**

**Expected Output:**

**Beautiful Value = 29**

#include <stdio.h>

#include <math.h>

int main(){

int n;

scanf("%d",&n);

int temp=n;

int beautiful=0;

int x;

while(temp!=0){

x=temp%10;

temp/=10;

beautiful+=x\*x;

}

printf("Beautiful value : %d",beautiful);

return 0;

}

**9. Check whether a number is prime or non prime:**

#include <stdio.h>

#include <math.h>

int main(){

int n;

scanf("%d",&n);

int temp=0;

for(int i=2;i<n;i++){

if(n%i==0){

temp=1;

}

}

if(temp==1){

printf("Non Prime");

}

else{

printf("Prime");

}

return 0;

}

**10. Write a C Program to Print all the prime number between 1 to N**

**Input :**

**100**

**Expected Output:**

**2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97**

#include <stdio.h>

#include <math.h>

int main(){

int n;

scanf("%d",&n);

for(int j=2;j<=n;j++){

int temp=0;

for(int i=2;i<j;i++){

if(j%i==0){

temp=1;

}

}

if(temp==0){

printf("%d ",j);

}

}

return 0;

}

**11. Armstrong number upto n (input integer n)**

#include <stdio.h>

#include <math.h>

//Armstrong number

int main(){

int k;

scanf("%d",&k);

for(int n=1;n<=k;n++){

int digit=0;

int temp=n;

while(temp!=0){

temp/=10;

digit++;

}

temp=n;

int sum=0;

while(temp!=0){

int x=temp%10;

temp/=10;

sum+=(int) pow(x,digit);

}

if(n==sum) printf("%d ",sum);

}

return 0;

}

**12.Print the Fibonacci series upto n**

#include<stdio.h>

int main(){

int a=0,b=1;

printf("%d, %d, ",a,b);

for(int i=1;i<=20;i++){

printf("%d, ",a+b);

int temp=a+b;

a=b;

b=temp;

}

return 0;

}

**Nested loop: Pattern**

**1. Square of stars**

**\* \* \* \* \***

**\* \* \* \* \***

**\* \* \* \* \***

**\* \* \* \* \***

**\* \* \* \* \***

#include<stdio.h>

int main(){

int n;

printf("Enter the number of rows: ");

scanf("%d",&n);

for (int row=1;row<=n;row++){

for (int col=1;col<=n;col++){

printf("\* ");

}

printf("\n");

}

return 0;

}

**2. Star square boundary**

**Output:**

**Enter the number of rows: 5**

**\*\*\*\*\***

**\* \***

**\* \***

**\* \***

**\*\*\*\*\***

#include<stdio.h>

int main(){

int n;

printf("Enter the number of rows: ");

scanf("%d",&n);

for (int row=1;row<=n;row++){

for (int col=1;col<=n;col++){

if(row==1 || col==1 || row==n || col==n) printf("\*");

else printf(" ");

}

printf("\n");

}

return 0;

}

**3. Diamond shaped stars**

#include <stdio.h>

#include <math.h>

int main(){

int n=5;

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

for (int j=1;j<=(n-i);j++){

printf(" ");

}

for( int k=1;k<=(2\*i-1);k++){

printf("\*");

}

printf("\n");

}

for (int i=n-1;i<=n;i--){

for (int j=1;j<=(n-i);j++){

printf(" ");

}

for( int k=1;k<=(2\*i-1);k++){

printf("\*");

}

printf("\n");

}

return 0;

}

**Functions**

**1. Factorial function:[n times imput]**

#include<stdio.h>

int fact1(int n) {

int fact = 1;

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

fact \*= I;

}

return fact; }

int main() {

int t, x;

scanf("%d", &t);

int r[t];

for (int j = 0; j < t; j++) {

scanf("%d", &x);

r[j] = fact1(x);

}

for (int j = 0; j < t; j++) {

printf("%d\n", r[j]); }

return 0;

}

**2. Summation**

#include<stdio.h>

sum();

int main(){

printf("Sum: %d",sum(3,4));

return 0;

}

int sum(int n,int m){

return n+m;

}

**Recursion**

**1.** **Write a program in C to print the Hello World 10 Times using recursion**

#include<stdio.h>

int printhello(int n){

if(n==0){

return 1;

}

printf("Hello world\n");

printhello(n-1);

}

int main(){

int n=10;

printhello(n);

}

**2.** **Write a program in C to print the first n natural numbers using recursion**

#include<stdio.h>

int fun(int n){

if(n>100){

return 1;

}

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

fun(n+1);

}

int main(){

int n=1;

fun(n);

return 0;

}

**3.** **Write a program in C to sum the first n natural numbers using recursion**

#include<stdio.h>

int fun(int n){

if(n==1){

return 1;

}

return fun(n-1)+n;

}

int main(){

int n=5;

int sum= fun(n);

printf("%d",sum);

return 0;

}

**4. Write a program in C to find the sum of digits of a number using recursion**

#include<stdio.h>

int fun(int n){

if(n<10){

When the function comes to the last digit; it returns the last digit.

return n;

}

return fun(n/10)+(n%10);

}

int main(){

int n=32414;

int sum= fun(n);

printf("%d",sum);

return 0;

}

**5. Write a program in C to count the digits of a given number using recursion**

#include<stdio.h>

**Global variable declaration**

int count=0;

int fun(int n){

if(n==0){

return 0;

}

count++;

return fun(n/10);

}

int main(){

int n=32414;

fun(n);

printf("%d",count);

return 0;

}

**6.Write a program in C to print the nth Fibonacci Number using recursion**

#include<stdio.h>

int fib(int n){

if(n==1) return 1;

if(n==0) return 0;

return fib(n-1)+fib(n-2);

}

int main(){

int n=6;

int f=fib(n);

printf("%d",f);

return 0;

}

**7. Input t times test case n; find the sum of the even valued fibonacci numbers until n:**

#include <stdio.h>

long long fib(int n) {

if (n == 1) return 1;

if (n == 2) return 2;

long long a = 1, b = 2, temp;

for (int i = 3; i <= n; i++) {

temp = a + b;

a = b;

b = temp;

}

return b;

}

int main() {

int t;

scanf("%d", &t);

long long sumar[t];

for (int i = 0; i < t; i++) {

long long n;

scanf("%lld", &n);

long long sumeven = 0;

for (int j = 1; fib(j) <= n; j++) {

long long evenfib = fib(j);

if (evenfib % 2 == 0) {

sumeven += evenfib;

}

}

sumar[i] = sumeven;

}

for (int i = 0; i < t; i++) {

printf("%lld\n", sumar[i]);

}

return 0;

}