

PROGRAMMING QUESTIONS AND SOLUTION

JavaScript Programs

1. Write a program to JavaScript that illustrate event handling.
2. Write a JavaScript to display 1 to 10 using for loop, while loop, and do-while loop.
3. Write a JavaScript program to calculate the factorial of a given number.
4. Write a JavaScript program to input three numbers and find the largest one.
5. Write a program to input any three numbers and find the average in JavaScript.
6. Write a program to find area and circumferences of circle in JavaScript.
7. Write a program to display all even number from 1 to 100 in JavaScript.
8. Write a program to sum of two number using function.
9. Write a program to input any number and find its reverse order in JavaScript.
10. Write a program to display the Fibonacci series. 1 1 2 3 5 8 13n in JavaScript.
11. Design a form with username, address, e-mail, password, and submit button. Validated the form using JavaScript.

PHP Programs

1. Design a form with a username and password and submit button. Write a PHP code to get value of username and password using
 - a) \$_POST variable and
 - b) \$_GET variable.
2. Write a PHP program to check if a string is a palindrome or not.
3. Write a PHP code to enter any two number and display their sum, difference and product.
4. Write a PHP code to find out area and perimeter of rectangle.
5. Create a registration form including Name, Address, Phone No., email address, Qualification, Gender and Country and get the values entered by user using post method and display.
6. Write a program in PHP to display all the even numbers from 1 to 100.
7. Write a program in PHP to input a number and check it is odd and even.
8. Write a program in PHP to display the multiplication table of a number.
9. Write a program in PHP to input a number and find its Armstrong or not.
10. Write a program in PHP to find the factors of an input a number.

C Programs

1. Write a program to input any three numbers and find out which one is the largest number using user defined function.
2. Write a program to display the day using the switch statement depending upon the number entered. i.e. input 1 for Sunday, 7 for Saturday using user defined function.
3. Write a program to input a number and check whether it is prime or not using function.
4. Write a program to display the sum of even and odd numbers from 1 to 50.
5. Write a program to accept the age of 10 different employees and count the number of employees.
 - a. Whose age is more than or equal to 60
 - b. Whose age is less than 35
6. Write a program to enter elements for 3x3 matrixes and Display its sum.
7. Write a program to accept 10 different numbers in an array and sort them in descending order.
8. Write a program to input a number and find out whether that number is palindrome or not using function
9. Write a program to input the names of N numbers of students and sort them in alphabetical order.
10. Write a program to read a number and make the sum of individual digits and print using the recursion technique.
11. Write a program that reads different names and address into the computer and rearrange the names into alphabetical order using the structure variables.
12. Write a program to read N students' records store them in the data file and display the content inappropriate format by using the fprintf and fscanf function.
13. Write a program to calculate the factorial of given number using recursive function.
14. Write a program to input radius of circle and find area and circumference of circle.

15. Write a program to input any two number and find HCF and LCM using function.
16. Write a program to store employee id, name and salary of 100 employee. The program should then display the record of employee in appropriate format whose salary is greater than 50,000 using structure.
17. Write a program to display the greatest number among three numbers using pointer.
18. Write a program to store Roll number, Name and class of 50 students in a file "student.txt".
19. Write a program to input any 10 number in array and find the largest number using among them.
20. Write a program to keep the record of students and calculate total and percentage and display all records.
21. Write a program to read the marks of any 5 students in a subject and count how many students are pass or fail.

JavaScript Programs:

1. Write a program to JavaScript that illustrate event handling.

Click Event

```
<html>
<head> Javascript Events </head>
<body>
<script>
    function clickevent()
    {
        document.write("This is Java Click Events");
    }
</script>
    <form>
        <input type="button" onclick="clickevent()" value="Click To View"/>
    </form>
</body>
</html>
```

Mouse Over Event

```
<html>
<head>
<h1> Javascript Events </h1>
</head>
<body>
<script>
    function mouseoverevent()
    {
        alert("This is Java MouseOverEvent");
    }
</script>
<p onmouseover="mouseoverevent()"> Keep Mouse's cursor over me</p>
</body>
</html>
```

Focus Event

```
<html>
<head> Javascript Events</head>
<body>
<h2> Enter something here</h2>
```

```
<input type="text" id="input1" onfocus="focusevent()"/>
<script>
  function focusevent()
  {
    document.getElementById("input1").style.background=" aqua";
  }
</script>
</body>
</html>
```

Keydown Event

```
<html>
<head> Javascript Events</head>
<body>
<h2> Enter something here</h2>
<input type="text" id="input1" onkeydown="keydownevent()"/>
<script>
  function keydownevent()
  {
    document.getElementById("input1");
    alert("Pressed a key");
  }
</script>
</body>
</html>
```

Load event

```
<html>
<head>Javascript Events</head>
</br>
<body onload="window.alert('Page successfully loaded');">
<script>
  document.write("The page is loaded successfully");
</script>
</body>
</html>
```

2. Write a JavaScript to display 1 to 10 using for loop, while loop, and do-while loop.

```
<html>
<head>
  <script>
    for (i=1; i<=10; i++)
    {
      document.write(i + "<br/>") // OR document.write(i);
    }
  </script>
</head>
</html>
```

While Loop

```
<script>
```

```
var i=1
while (i<=10)
{
    document.write(i);
    i=i+1;
}
</script>
```

```
<script>
var i=1;
do
{
document.write(i + "<br/>");
i=i+1;
}while (i<=10);
</script>
```

3. Write a JavaScript program to calculate the factorial of a given number.

```
<script>
var num = parseInt(prompt("Enter a positive integer: "));
if (num < 0)
{
    window.alert("Factorial of negative numbers doesn't exist.");
}
else if (num == 0)
{
    document.write("Factorial of 0 is: 1");
}
else
{
    let fact = 1;
    for (i = 1; i <= num; ++i)
    {
        fact = fact * i;
    }
    document.write("Factorial of number is:" + fact);
}
</script>
```

4. Write a JavaScript program to input three numbers and find the largest one.

```
<script>
var a=parseInt(prompt("Enter first Number"));
var b=parseInt(prompt("Enter Second Number"));
var c=parseInt(prompt("Enter Third Number"));
if (a>b&&a>c)
{
    document.write("Largest Number is", +a);
}
else if (b>a&&b>c)
{
```

```

        document.write("Largest Number is", +b);
    }
    else
    {
        document.write("Largest Number is", +c);
    }
</script>

```

5. Write a program to input any three numbers and find the average in JavaScript.

```

<script>
var a = parseInt(prompt("Enter First Number: "));
var b = parseInt(prompt("Enter Second Number: "));
var c = parseInt(prompt("Enter Third Number: "));
var average = (a + b + c) / 3;
window.alert ("The average of three numbers: " + average);
</script>

```

6. Write a program to find area and circumferences of circle in JavaScript.

```

<script>
var a1 =prompt("Enter the Radius ");
    r=parseInt(a1)
    var area = 22/7*r*r;
    var circum=2*22/7*r;
document.write("Area of circle is " + area);
document.write("Circumference of circle is " + circum);
}
</script>

```

7. Write a program to display all even number from 1 to 100 in JavaScript.

```

<script>
    var i=2;
    while (i<=100)
    {
        document.write(i);
        i=i+2;
    }
</script>

```

8. Write a program to sum of two number using function.

```

<script>
function sum()
{
var a1 =prompt("Enter the first number: ");
var a2=prompt("Enter the second number: ");
    a=parseInt(a1)
    b=parseInt(a2)
var sum = a+b;
document.write("sum of two number is " + sum);

```

```

}
</script>
<body>
    Click to Find sum of two numbers <br>
    <Input type=button onclick=sum() value=ClickHere>
</body>

```

9. Write a program to input any number and find its reverse order in JavaScript.

```

function rev_num()
{
var num = prompt("Enter the number");
var n= num;
var rev = 0, rem;
while (n>0)
{
rem = n % 10;
rev = rev * 10 + rem ;
n = Math.floor(n/10);
}
document.write("The given number is : " +num+ " <br/> The reversed number is : " +rev+ "\n");
}

```

10. Write a program to display the Fibonacci series. 0 1 1 2 3 5 8 13n in JavaScript.

```

<html>
<body>
<script type=text/javascript>
    var a=0, b=1, c;
    document.write("Fibonacci series <br/>");
    while(a<20)
    {
        document.write(a+",");
        c=a+b;
        a=b;
        b=c;
    }
</script>
</body>
</html>

```

11. Design a form with username, password and submit button. Validated the form using JavaScript.

```

<html>
<body>
<script>
function myFormValidate ( )
{
var name = document.myform.name.value; var password =
document.myform.password.value;
if (name==null || name=="")
{

```

```

alert("Please, Enter Name");
return false;
}
else if (password.length < 5)
{
    alert ("Password must be at least 5 characters long.");
return false;
}
}
</script>
<body>
<form name = "myform" method = "post" action = "abc.php" onsubmit = "return
myFormValidate ( )" >
Name: <input type = "text" name = "name"><br/>
Password: <input type = "password" name = "password"><br/>
<input type = "submit" value = "Login">
</form>
</body>
</html>

```

EXTRA WORKOUT EXAMPLES

JavaScript Program to find sum of two numbers.

```

<script>
var a1 =prompt("Enter the first number: ");
var a2=prompt("Enter the second number: ");
    a=parseInt(a1)
    b=parseInt(a2)
var sum = a+b;
document.write("sum of two number is " + sum);
</script>

```

JavaScript Program to Calculate the Area of a Triangle

```

<script>
var base =parseInt(prompt("Enter the base: "));
var height =parseInt(prompt("Enter the height: "));
var area = (base * height) / 2;
document.write("The area of the triangle is " + area);
</script>

```

JavaScript Program to Find the Square Root

```

<script>
var num = prompt("Enter a Number");

```

```
var root = Math.sqrt(num);
document.write("The Square Root of " + num + " is " + root);
</script>
```

JavaScript Program to Find the Square Root using function

```
<script>
function sqrt()
{
var num = prompt("Enter a Number");
var root = Math.sqrt(num);
document.write("The Square Root of " + num + " is " + root);
}
</script>
<body>
    Click to Find the Square Root <br>
    <Input type=button onclick=sqrt() value=ClickHere>
</body>
</html>
```

Write a function to input two numbers and display their sum when the user click on 'ADD' button in JavaScript using function.

```
<html>
  <head>
    <title> To find out sum of Given two numbers </title>
    <script type="text/JavaScript">
      function add()
      {
        var a,b,c;
        a=Number(document.getElementaryById("first").value);
        b=Number(document.getElementaryById("second").value);
        c=a+b;
        document.getElementaryById("answer").value=c;
      }
    </script>
  </head>
  <body>
    Enter the First Numebr:   <input id="first">   <br>
    Enter the Second Number: <input id="second"> <br> <hr>
    <button onclick="add()"> Addition </button>
    <input id="answer">
  <input id="second">
  </body>
</html>
```

Negative or Positive number


```
<script>
var n=prompt("Enter Number");
if (n>0)
{
    document.write("Given Number is Positive");
}
else
{
    document.write("Given Number is Negative");
}
</script>
```

Even or odd number

```
<script>
var n=prompt("Enter Number");
if (n%2==0)
{
    document.write("Given Number is Even");
}
else
{
    document.write("Given Number is odd");
}
</script>
```

Find largest one among two numbers.

```
<script>
var a=prompt("Enter Number");
var b=prompt("Enter Number");
if (a>b)
{
    document.write("Largest number is", +a);
}
else
{
    document.write("Largest number is", +b);
}
</script>
```

Write a JavaScript and HTML to ask a number from a user and display the name of day according to user's choice.

```
<html>
<head>
```

```

<title> Switch Case Example For to find Name of the day.</title>
</head>
<body>
<script>
    var n=prompt("Enter a number between 1 and 7");
    switch(n)
    {
        case(n="1");
        document.write("The day is Sunday");
        break;
        case(n="2");
        document.write("The day is Monday");
        break;
        case(n="3");
        document.write("The day is Tuesday");
        break;
        case(n="4");
        document.write("The day is Wednesday");
        break;
        case(n="5");
        document.write("The day is Thursday");
        break;
        case(n="6");
        document.write("The day is Friday");
        break;
        default:
        document.write("Invalid day");
        break;
    }
</script>
</body>
</html>

```

JavaScript program to check whether a number is a prime number or not. This program does not take input from user.

```

<html>
<body> <script>
var num, i, c=0;
num=9;
for(i=2; i<num; i++)
{
if(num%2==0)
{
C++;
break;
}
}
if(c==0)
document.write(num+" is a Prime Number");
else
document.write(num+" is not a Prime Number");
</script> </body>
</html>

```

PHP Programs

1. Write a php code to enter your name and display it.

```
<html>
<head>
<title> Your name </title>
</head>
<body>
    <B> Enter your Name</B> <br/>
<form method="POST">
<input type="text" name="name" /> <br/>
<input type="submit" value="submit" />
</form>
<?php
$name=$_POST['name'];
echo "Your Name=$name";
?>
</body>    </html>
```

2. Write a php code to display the factorial of a number given by user.

```
<html>
<head>
<title> Your name </title>
</head>
<body>
    <B> Factorial Calculaiton</B> <br/>
<form method="POST">
    Input a Number: <input type="Number" name="number" /> <br/>
    <input type="submit" value="Calculate" />
</form>
<?php
    $n=$_POST['number'];
    $fact=1;
for($i=1; $i<=$n;$i++)
{
    $fact=$fact*$i;
}
echo "The factorial of $n=$fact";
?>
</body>
</html>
```

3. Write a php code to display all even numbers up to 50.

```
<html>
<head>
<title> Your name </title>
</head>
<body>
    <B> Display Even number up to 50</B> <br/> <hr>
<?php
    $a=2;
for($i=1;$i<=25;$i++)
{
    echo "$a, ";
    $a=$a+2;
}
?>
</body>
</html>
```

4. Write a PHP code to display the simple interest.

```

<html>
<head>
<title> Calculate simple Interest </title>
</head>
<body>
    <B> Calculate Simple Interest</B> <br/>
    <form method="POST">
        Enter Principal:<input type="Number" name="p"/> <br/>
        Enter Time:<input type="Number" name="t"/> <br/>
        Enter Rate: <input type="Number" name="r"/> <br/>
        <input type="submit" value="Calculate SI"/>
    </form>
<?php
    $p=$_POST['p'];
    $t=$_POST['t'];
    $r=$_POST['r'];
    $si=($p*$t*$r)/100;
    echo "Simple Interest=$si";
?>
</body>
</html>

```

Workout Examples

Given program shows the sum of digits of 14597.

```

<?php
$num = 14597;
$sum=0; $rem=0;
for ($i =0; $i<=strlen($num);$i++)
{
    $rem=$num%10;
    $sum = $sum + $rem;
    $num=$num/10;
}
echo "Sum of digits 14597 is $sum";
?>

```

Check the given number is odd or even

```

<?php
$number=1233456;
if($number%2==0)
{
    echo "$number is Even Number";
}
else
{
    echo "$number is Odd Number";
}
?>

```

Even Odd Program using Form in PHP

By inserting value in a form we can check that inserted value is even or odd.

Example:

```

<html>
<body>
<form method="post">

```

Enter a number:

```
<input type="number" name="number">
<input type="submit" value="Submit">
</form>
</body>
</html>
<?php
    if($_POST)
    {
        $number = $_POST['number'];
        if(($number % 2) == 0)
        {
            echo "$number is an Even number";
        }
    }
else
{
    echo "$number is Odd number";
}
?>
```

Prime number in PHP

Example:

Here is the Program to list the first 15 prime numbers.

```
<?php
$count = 0;
$num = 2;
while ($count < 15 )
{
    $div_count=0;
    for ( $i=1; $i<=$num; $i++)
    {
        if (($num%$i)==0)
        {
            $div_count++;
        }
    }
    if ($div_count<3)
    {
        echo $num." , ";
        $count=$count+1;
    }
    $num=$num+1;
}
?>
```

Prime Number using Form in PHP

Example:

We'll show a form, which will check whether a number is prime or not.

```
<form method="post">
Enter a Number: <input type="text" name="input"><br><br>
```

```
<input type="submit" name="submit" value="Submit">
</form>
```

```
<?php
if($_POST)
{
    $input=$_POST['input'];
    for ($i = 2; $i <= $input-1; $i++) {
        if ($input % $i == 0) {
            $value= True;
        }
    }
    if (isset($value) && $value)
    {
        echo 'The Number ' . $input . ' is not prime';
    }
    else
    {
        echo 'The Number ' . $input . ' is prime';
    }
}
?>
```

To display the table of given number

```
<?php
define('a', 7);
for($i=1; $i<=10; $i++)
{
    echo $i*a;
    echo '<br>';
}
?>
```

Factorial in PHP

Factorial of 4 using for loop is shown below.

Example:

```
<?php
$num = 4;
$factorial = 1;
for ($x=$num; $x>=1; $x--)
{
    $factorial = $factorial * $x;
}
echo "Factorial of $num is $factorial";
?>
```

Factorial using Form in PHP

Below program shows a form through which you can calculate factorial of any number.

Example:

```
<html>
```

```

<head>
<title>Factorial Program using loop in PHP</title>
</head>
<body>
<form method="post">
  Enter the Number:<br>
  <input type="number" name="number" id="number">
  <input type="submit" name="submit" value="Submit" />
</form>
<?php
  if($_POST)
  {
    $fact = 1;
    $number = $_POST['number'];
    echo "Factorial of $number:<br><br>";
    for ($i = 1; $i <= $number; $i++)
    {
      $fact = $fact * $i;
    }
    echo $fact . "<br>";
  }
?>
</body>
</html>

```

Armstrong number in PHP

Below program checks whether 407 is Armstrong or not.

Example:

```

<?php
$num=407;
$total=0;
$x=$num;
while($x!=0)
{
  $rem=$x%10;
  $total=$total+$rem*$rem*$rem;
  $x=$x/10;
}
if($num==$total)
{
  echo "Yes it is an Armstrong number";
}
else
{
  echo "No it is not an armstrong number";
}
?>

```

Armstrong number using Form in PHP

A number is Armstrong or can also be checked using a form.

Example:

```
<html>
<body>
<form method="post">
Enter the Number:
  <input type="number" name="number">
  <input type="submit" value="Submit">
</form>
</body>
</html>
<?php
if($_POST)
{
  $number = $_POST['number'];
  $a = $number;
  $sum = 0;
  while( $a != 0 )
  {
    $rem = $a % 10;
    $sum = $sum + ( $rem * $rem * $rem );
    $a = $a / 10;
  }
  if( $number == $sum )
  {
    echo "Yes $number an Armstrong Number";
  }else
  {
    echo "$number is not an Armstrong Number";
  }
}
?>
```

To check number is palindrome or not

```
<?php
function palindrome($n)
{
  $number = $n;
  $sum = 0;
  while(floor($number))
  {
    $rem = $number % 10;
    $sum = $sum * 10 + $rem;
    $number = $number/10;
  }
  return $sum;
}


```



```

$num = palindrome($input);
if($input==$num)
{
echo "$input is a Palindrome number";
}
else
{
echo "$input is not a Palindrome";
}
?>

```

Palindrome Number using Form in PHP

Example:

We'll show the logic to check whether a number is palindrome or not.

```

<form method="post">
Enter a Number: <input type="text" name="num"/><br>
<button type="submit">Check</button>
</form>
<?php
    if($_POST)
    {
        $num = $_POST['num'];
        $reverse = strrev($num);
        if($num == $reverse){
            echo "The number $num is Palindrome";
        }
    }
else
{
    echo "The number $num is not a Palindrome";
}
}
?>

```

We'll show an example to print the first 12 numbers of a Fibonacci series.

```

<?php
$num = 0;
$n1 = 0;
$n2 = 1;
echo "<h3>Fibonacci series for first 12 numbers: </h3>";
echo "\n";
echo $n1.' '.$n2.' ';
while ($num < 10 )
{
    $n3 = $n2 + $n1;
    echo $n3.' ';
    $n1 = $n2;
    $n2 = $n3;
    $num = $num + 1;
}
?>

```

C Programs

1. Write a program to input any three numbers and find out which one is the largest number using user defined function.

```
#include<stdio.h>
#include<conio.h>
int lar(int, int, int)
void main()
{
    int a,b,c;
    printf("\n Enter any three number");
    scanf("%d",&a,&b,&c);
    lar(a,b,c)
getch();
}
int lar(int a, int b, int c)
{
if(a>b&&a>c)
{
    printf("\n Largest number is %d",a);
}
else if(b>a&&b>c)
{
    printf("\n Largest number is %d", b);
}
else
{
    printf("\n Largest number is %d",c);
}
}
```

Write a program to display the day using the switch statement depending upon the number entered. i.e. input 1 for Sunday, 7 for Saturday.

```
#include<stdio.h>
#include<conio.h>
Void main()
{
int n;
printf("enter the number of day");
Scanf("%d",&n);
switch(n)
{
case 1:
printf("\n Today is Sunday");
break;
case 2:
printf("\n Today is Monday");
break;
case 3:
printf("\n Today is Tuesday");
```

```

break;
case 4:
printf("\n Today is Wednesday");
break;
case 5:
printf("\n Today is Thursday");
break;
case 6:
printf("\n Today is Friday");
break;
case 7:
printf("\n Today is Saturday");
break;
default:
printf("\n Wrong choice");

```

Program: Write a program to find out the area of circle through given radius as argument using function.

```

# include<stdio.h>
# include<conio.h>
float area(float);
void main( )
{
clrscr();
float rad,res;
printf("enter the radius of a circle");
scanf("%f",rad)
res=area(rad)
printf("your required area is %f ",res);
}
float area(float a)
{
float mm,pi=3.14;
mm=pi*a*a;
return(mm);
}

```

Program: Write a program in C to create a function to pass two numbers as an argument and to return a sum to the calling function.

```

# include<stdio.h>
# include<conio.h>
int add(int ,int);
void main( );
{
clrscr();
int a,b,c;
printf("enter any two numbers");
scanf("%d%d",&a,&b);
c=add(a,b);
printf("The sum of a and b is= %d",c);
}

```

```

}

int add(int x, int y)
{
int sum;
sum=x+y;
return(sum);
}

```

Without passing arguments

Program: Write a program to find out sum and square of two input number without passing arguments function.

```

#include<stdio.h>
#include<conio.h>
int sum( );
int square( );
void main()
{
sum( );
square( );
}
int sum( )
{
int a,b, sum;
printf("enter any two number");
scanf("%d%d",&a,&b);
sum=a+b;
printf("sum is=%d",sum);
return(sum);
}
int square( )
{
int a,b, square;
printf("enter any number");
scanf("%d",&a);
square=a*a;
printf("square is=%d",square);
return(square);
}

```

WAP to calculate simple interest using function

```

#include
float interest(float); //function declaration
int main()
{ float si;
si=interest(); //function call
printf("Simple interest is %.2f\n",si);
}

```

```

float interest() //function definition
{
    float p,t,r,i;
    printf("Enter Principal, Time and Rate");
    scanf("%f%f%f",&p,&t,&r);
    i=(p*t*r)/100;
    return i; //function return value
}

```

WAP to calculate area of rectangle using function.

```

#include<stdio.h>
#include<conio.h>
int area (void);
void main()
{
    int a;
    a = area();
    printf("area is %d",a);

}
int area()
{
    int l,b,ar;
    printf("Enter length and breadth");
    scanf("%d%d",&l,&b);
    ar = l*b;
    return ar;
}

```

Program: Write a program to calculate factorials by using recursion process.

```

#include<stdio.h>
#include<conio.h>
int fact(int);
void main( )
{
    clrscr();
    int n;
    printf("Enter a number");
    scanf("%d",&n);
    printf("The factorial of %d is %d",n,fact(n));
}
int fact(int n)
{
    if(n<=1)
    return (1)
    else
    {
    return(n*fact(n-1)); or          z=(n*fact(n-1));
    }
    return z;
}

```

Program: Write a program read a number and make the sum of individual digits & print using recursion technique.

```

#include<stdio.h>
#include<conio.h>
int sum(int)
void main()
{
    clrscr();
    int n;
    printf("Enter the any number");
    scanf("%d",&n);
    printf("The sum of individual digits is %d",sum);
int sum(int n)
{
    int a;
    if(n>0)
    {
        a=n%10;
        n=n/10;
        rturn(a+sum(n));
    }
}

```

WAP to calculate sum of n-natural number using recursion/recursive function.

```

#include<stdio.h>
int sum (int);
void main()
{
    int n,s;
    printf("Enter any number");
    scanf("%d",&n);
    s = sum(n);
    printf("Sum is %d\n",s);
}
int sum (int n)
{
    if (n<=0)
        return 0;
    else
        return (n+sum(n-1));
}

```

Example 1, Write a C program to read different structure variables and display them.

```

#include<stdio.h>
#include<conio.h>
void main( )
{
    struct student
    {
        int roll;
        char name[30];

```

```

        char section;
        float height;
    } s1
    printf("\n Enter roll numer");
    scanf("%d",&s1.roll );
    printf("\n Enter name:");
    gets(s1.name);
    printf("\n Enter section:");
    scanf("%c",&s1.section);
    printf("\n Enter height");
    scanf("%f",&s1.height);
    printf("\n You have entered:\n");
    printf(" Roll Numer %d Name is %s section %c and height is %f",
    s1.roll,s1.name,s1.section,s.height);
}

```

Program: Write a program to input the employee name and their basic salary of n employees and display the record in proper format.

```

#include<stdio.h>
#include<conio.h>
void main ()
{
    struct employee
    {
        char name[10];
        int salary;
    };
    struct employee e[100],t;
    int i,j,n;
    printf("\n How many records");
    scanf("%d", &n);
    for(i=0; i<n; i++)
    {
        printf("\n Enter name of employee");
        gets(e[i].name);
        printf("\n Enter salary of employee:");
        scanf("%d",&e[i].salary);
    }
    printf("\n Employee \t \t salary);
    printf("\n =====");
    for(i=0; i<n; i++)
    {
        printf("\n %s \t\t\t %d",e[i].name,e[i].salary);
    }
    printf("\n=====");
}

```

Program: Write a program that reads different names and addresses into the computer and rearrange the names into alphabetical order using the structure variables.

```

#include<stdio.h>

```

```

#include<conio.h>
#include<string.h>
void main ()
{
int i,j,n;
    struct student
    {
        char name[50];
        char address[50];
    };
    struct student s[200],t;
    printf("\n how many records do you want store?");
    scanf("%d",&n);
    for (i=0; i<n; i++)
    {
        printf("\n Enter name of the student:");
        gets(s[i].name);
        printf("\n Enter address of the student:");
        gets(s[i].address);
    }
    for (i=0; i<n; i++)
    {
        for (j=0; j<n-1; j++)
        {
            If(strcmpi (s[j].name,s[j+1].name)>0)
            {
                t=s[j];
                s[j]=s[j+1];
                s[j+1]=t;
            }
        }
    }
    Printf("\n\n The records of the student after sorting\n");
    Printf("\n Name of student      Address      ");
    for (i=0; i<=n; i++)
    {
        printf("\n %s %s", s[i].name,s[i].address);
    }
}

```

Program example

1) Create a datafile "patient.txt" and store name, disease, age and bed number of a patient.

```

#include<stdio.h>
void main()
{
    char n[10], d[10];
    int a, b;
    FILE *fptr;
    fptr = fopen("patient.txt","w");

```



```

printf("Enter name, disease, age and bed number");
scanf("%s %s %d %d", n, d, &a, &b);
fprintf(fptr,"%s %s %d %d\n", n, d, a, b);
fclose(fptr);
}

```

[Note: This program will store only single record to store multiple record we have to use loop as following programs.

2) Create a datafile "student.txt" and store name, class and marks obtained in 3 different subject for few students/n-students.

```

#include<stdio.h>
void main()
{
    char n[10];
    int c, e, ne, m, i, num;
    FILE *fptr;
    fptr = fopen("student.txt","w");
    printf("How many record?");
    scanf("%d",&num);
    for(i=1;i<=num;i++)
    {
        printf("Enter name class and 3 marks");
        scanf("%s %d %d %d %d",n, &c, &e, &ne, &m);
        fprintf(fptr,"%s %d %d %d %d \n",n, c, e, ne, m);
    }
    fclose(fptr);
}

```

3) Create a datafile "student.txt" and store name, class and marks obtained in 3 different subject until user press "y" / as per user requirement.

```

#include<stdio.h>
int main()
{
    char n[10],ch[3];
    int c, e, ne, m;
    FILE *fptr;
    fptr = fopen("student.txt","w");
    do
    {
        printf("Enter name class and 3 marks");
        scanf("%s %d %d %d %d",n, &c, &e, &ne, &m);
        fprintf(fptr,"%s %d %d %d %d\n",n, c, e, ne, m);
        printf("Press Y to continue");
        scanf("%s",ch);
    } while (strcmp(ch,"Y") == 0 || strcmp(ch,"y")==0);
    fclose(fptr);
}

```

Add/Append data

1) A datafile "student.txt" contain name, class and marks obtained in 3 different subject of few students. Write a C program to add 200 more records.

```
#include<stdio.h>
void main()
{
    char n[10];
    int c, e, ne, m, i;
    FILE *fptr;
    fptr = fopen("student.txt","a");
    for(i=1;i<=200;i++)
    {
        printf("Enter name class and 3 marks");
        scanf("%s %d %d %d %d", n, &c, &e, &ne, &m);
        fprintf(fptr,"%s %d %d %d %d \n",n, c, e, ne, m);
    }
    fclose(fptr);
}
```

2) A datafile "student.txt" contain name, class and marks obtained in 3 different subject of few students. Write a C program to add more records until user press "y" / as per user requirement.

```
#include<stdio.h>
void main()
{
    char n[10], ch[3];
    int c, e, ne, m;
    FILE *fptr;
    fptr = fopen("student.txt","a");
    do
    {
        printf("Enter name class and 3 marks");
        scanf("%s %d %d %d %d", n, &c, &e, &ne, &m);
        fprintf(fptr,"%s %d %d %d %d\n", n, c, e, ne, m);
        printf("Press Y to continue");
        scanf("%s",ch);
    } while (strcmp(ch,"Y") == 0 || strcmp(ch,"y")==0);
    fclose(fptr);
}
```

Read/Display/retrieve/access data from a datafile

Syntax:

```
fscanf(fptr, "format specifiers", variables);
```

Eg; suppose if we want to display/read name, disease, age and bed number of a patient from data file then, it is written as

```
fscanf(fptr, "%s %s %d %d", n, d, &a, &b);
```

Where, variable are initialized as:

```
char n[10], d[10];
```

```
int a,b;
```

EOF: End of file

```
1) A d#include <stdio.h>
void main()
{
    char n[10];
    int c, e, ne, m;
    FILE *fptr;
    fptr = fopen("student.txt","r");
    printf("Name\tPercentage\n");
    while(fscanf(fptr,"%s %d %d %d %d",n,&c,&e,&ne,&m) != EOF)
    {
        printf("%s %d %d %d %d", n, c, e, ne, m);
    }
    fclose(fptr);
}
```

2) A datafile "student.txt" contain name, class and marks obtained in 3 different subject of few students. Write a C program to read and display only records whose name is Ram.

```
#include<stdio.h>
void main()
{
    char n[10];
    int c, e, ne, m;
    FILE *fptr;
    fptr = fopen("student.txt","r");
    while(fscanf(fptr,"%s %d %d %d %d",n,&c,&e,&ne,&m) != EOF)
    {
        strlwr(n);
        if (strcmp(n,"ram") == 0)
        {
            printf("%s %d %d %d %d", n, c, e, ne, m);
        }
    }
    fclose(fptr);
}
```

3) A datafile "student.txt" contain name, class and marks obtained in 3 different subject of few students. Write a C program to read and display only records who pass in all subjects.

```
#include<stdio.h>
void main()
{
    char n[10];
    int c, e, ne, m;
    FILE *fptr;
    fptr = fopen("student.txt","r");
    while(fscanf(fptr,"%s %d %d %d %d",n,&c,&e,&ne,&m) != EOF)
    {
        if (e>=40 && ne>=40 && m>=40)
        {
```

```

    printf("%s %d %d %d %d", n, c, e, ne, m);
}
}
fclose(fp);
}

```

4) A datafile "student.txt" contain name, class and marks obtained in 3 different subject of few students. Write a C program to read and display only records who fail in any one subject.

```

#include<stdio.h>
void main()
{
    char n[10];
    int c, e, ne, m;
    FILE *fp;
    fp = fopen("student.txt","r");
    while(fscanf(fp, "%s %d %d %d %d", n, &c, &e, &ne, &m) != EOF)
    {
        if (e<40 || ne<40 || m<40)
        {
            printf("%s %d %d %d %d", n, c, e, ne, m);
        }
    }
    fclose(fp);
}

```

5) A datafile "student.txt" contain name, class and marks obtained in 3 different subject of few students. Write a C program to read and display only name and percentage of all students

```

#include<stdio.h>
int main()
{
    char n[10];
    int c, e, ne, m;
    float p;
    FILE *fp;
    fp = fopen("student.txt","r");
    while(fscanf(fp, "%s %d %d %d %d", n, &c, &e, &ne, &m) != EOF)
    {
        p = (e+ne+m)/3;
        printf("%s %f", n, p);
    }
    fclose(fp);
}

```

6) A datafile "student.txt" contain name, class and marks obtained in 3 different subject of few students. Write a C program to read and display only records of all students who secure distinction.

```
#include<stdio.h>
int main()
{
    char n[10];
    int c, e, ne, m;
    float p;
    FILE *fptr;
    fptr = fopen("student.txt","r");
    while(fscanf(fptr, "%s %d %d %d %d", n, &c, &e, &ne, &m) != EOF)
    {
        p = (e+ne+m)/3;
        if (p>=80)
        {
            printf("%s %d %d %d %d", n, c, e, ne, m);
        }
    }
    fclose(fptr);
}
```

Program: Write a program to read a line and store it in a data file and display the contents.

```
#include<stdio.h>
#include<conio.h>
void main( )
char I;
FILE *f, *q;
f = fopen("store.txt","w");
while((i=getchar())!='\n')
{
    fputc(i, f);
}
fclose( f);
q=fopen ("store.txt","r");
while((i=fgetc(q))!=EOF)
{
    Printf("%c",i);
}
}
```

Program: Write a C program to read N students record store them in data file and display the content in appropriate format by using fprintf and fscanf function.

```
#include<stdio.h>
void main( )
{
    FILE *f;
    f= fopen ('ratna.txt',"w");
    int i, rn, n;
    char name[25], add[35];
```

```

printf("\n how many records?");
scanf("%d", &n);
printf("Enter %d student roll number, name and address:\n",n);
for (i=0; i<n; i++)
{
    scanf("%d %s %s",&rn,name,add);
    fprintf( f, "%d\t%s\t%s\n ",rn,name,add);
}
fclose(f);
printf("\n The %d data records",n);
f= fopen ("ratna.txt","r");
while (fscanf( f, "%d %s %s",&rn,name,add)!=EOF)
{
    printf("\n %d\t%s\t%s",rn,name,add);
}
fclose(f);
}

```

Program: Write a program using C language that reads successive records from the new data file and display each record on the screen in an appropriate format.

```

#include<stdio.h>
#include<conio.h>
void main( )
{
    struct student.
    {
        char name[50];
        char add[80];
    };
    struct student  s;
    char next='Y' ;
    FILE  *fp;
    fp = fopen ("C:\\student.txt","w");
    while(next=='Y' || next=='y')
    {
        printf("\n Enter the name of the student");
        gets(s.name);
        printf("\n Enter the address of the student");
        gets(s.add);
        fwrite(&s, sizeof (s), 1, fp);
        printf("\n Do you want to write next record (Y/N)");
    }
    fclose(fp);
    fp=fopen ("C:\\student.txt", "r");
    printf("\n Name of student Address");
    while (fread (&s, sizeof(s), 1,f(p))==1)
    {
        printf("\n %s \t\t\t %s",s.name,s.add);
    }
}

```

```
fclose (fp);
```

Program: Write a C program to read sentence until enter key pressed. Put every words in data file by using fputs() function and display the content of file by using fgets() function.

```
#include<stdio.h>
#include<conio.h>
Void main( )
{
    Char a[20];
    FILE *f;
    f= fopen ("senten.doc", "w");
    printf("\n Enter sentence");
    gets(a)
    while (strlen (gets(a))>0)
    {
        fputs(a,f);
    }
    fclose(f);
    f = fopen ("senten.doc", "r");
    if (f== NULL)
    printf("\n Cannot open the file");
    else
    {
        While (fgets (a,19,f)!=NULL)
        {
            printf("%s",a);
        }
    }
    fclose(f);
}
```

Program: Write a C program to read ages of N students, store them in age.txt file and find out the average age after reading from data file.

```
#include<stdio.h>
#include<conio.h>
Void main( )
{
    int ag,n, i, sum=0;
    float avg;
    FILE *f;
    f= fopen("age.txt", "w");
    printf("\n How many student:");
    scanf("%d",&n);
    for(i=0; i<n; i++)
    {
        printf("\n Enter %d student ages",i+1);
        scanf("%d",&ag);
        putw(ag,f);
    }
}
```

```

fclose (f);
f= fopen ("age.txt" , "r");
printf("\n Calculating average age from file");
for (i=0; i<n; i++)
{
    sum=sum+getw(f);
}
avg = (float) sum / n ;
printf("\n Average age of %d student is %f" , n, avg);
fclose(f);
}

```

Program: Write C program to read already created data file student.txt and display it contents if it opens otherwise print message "The filedoes not exists".

```

#include<stdio.h>
#include<conio.h>
Void main( )
{
    char i;
    FILE *f;
    f = fopen ("student.txt" , "r");
    If (f== NULL)
    {
        printf("\n The student.txt file does not exists");
    }
    else
    {
        while ( ( i=fgetc(f))!=EOF)
        {
            printf("%c",i);
        }
    }
    fclose(f);
}

```

Program: Write a program to read 50 students marks and display them.

```

#include<stdio.h>
#include<conio.h>
void main( )
{
    int i, M[50];
    printf("Enter the 50 student Marks");
    for(i=1; i<=50; i++)
    {
        scanf("%d",&M[i]);
    }
    printf("The numbers are:");
    for(i=1; i<=50; i++)
    {
        printf("%d\t",M[i]);
    }
}

```


Program: Write a program to input 5 numbers with constant values initialization in array to display the sum.

```
#include<stdio.h>
#include<conio.h>
void main( )
{
    int i,sum=0;
    int num[5]={5,10,15,20,25};
    for(i=0;i<5;i++)
    {
        printf("%d\t",num[i]);
        sum=sum+num[i];
    }
    printf("\n Sum of 5 numbers is:%d",sum);
    getch();
}
```

Program: Write a program to input the age of 20 students and count the number of students having age in between 20 to 25.

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i, age[10],c=0;
    for(i=0;i<20;i++)
    {
        printf("enter age of students:");
        scanf("%d",&age[i]);
    }
    for(i=0;i<20;i++)
    {
        if(age[i]>=20&& age[i]<=25)
        {
            c++;
        }
    }
    printf("Total number of students having age between 20 to 25 is %d",c);
    getch();
}
```

Program: Write a program to find the largest number among 'n' numbers.

```
#include<stdio.h>
#include<conio.h>
Void main()
{
    int i, n, num[100],max;
    printf("\n Enter the size of array not more than 100");
    scanf("%d",&n);
    for(i=0;i<n;i++)
    {
        printf("Enter array elements");
    }
}
```

```

        scanf("%d",&num[i])
    }
    max=num[0];
    for(i=1;i<n;i++)
    {
        if(num[i]>max)
        {
            max=num[i];
        }
    }
    printf("\n Largest number in array is %d",max);
    getch();
}

```

Program: Write a program to read a matrix, store it in array and display it.

```

#include<stdio.h>
#include<conio.h>
void main( )
{
    clrscr();
    int I,J, matrix[3][4];
    printf("Enter a matrix of 2x4:\n\n");
    for(I=1; I<=3; I++)
    {
        for(J=1; J<=4; J++)
        {
            scanf("%d",&matrix[I][J]);
        }
    }
    Printf("\n The elements of matirx are: \n\n");
    for(I=1; I<=3; I++)
    {
        for(J=1; J<=4; J++)
        {
            printf("%d\t",matrix[I][J]);
        }
        printf("\n");
    }
}

```

Program: Write a program to calculate the average age of 10 students.

```

# include<stdio.h>
# include<conio.h>
void main( )
{
    int avg, i, sum=0;
    int age[10];
    for (i=1; i<=10; i++)
    {
        print("\n Enter age");
        scanf("%d",&age[i]);
    }
}

```

```

    }
    for (i=1; i<=10; i++)
    {
        sum=sum+age[i];
        avg=sum/10;
    }
    printf("\n Average age=%d", avg);
}

```

Program: Write a program to accept the age of 10 different employees and count the no. of employee.

i) Whose age is more than or equal to 60

ii) Whose age is less than 35

```

#include<stdio.h>
#include<conio.h>
void main( )
{
    int age[10];
    int count1=0;
    int count2=0;
    int i;
    for (i=1; i<=10; i++)
    {
        printf("Enter the ages");
        scanf("%d", &age[i]);
    }

    for (i=1; i<=10; i++)
    {
        if (age[i]>=60)
        {
            count1++;
        }
        else
        {
            if(age[i]<=35)
            {
                count2++;
            }
        }
    }

    printf("Employees above or equal to 60 %d",count1);
    printf("Employees under or equal 35 %d",count2);
}

```

Program: Write a program to store N numbers in array and print out the sum with the entire array variable.

```

#include<stdio.h>
#include<conio.h>
void main( )
{
    int j, sum=0;
    int n,num[10];
    clrscr();

```

```

printf("Enter the how many no. you want to enter"):
scanf("%d",&n);
for (j=1; j<=n; j++)
{
    printf("number stored %d",num[i]);
    sum=sum+num[j];
}
printf("\n Sum is %d",sum);
}

```

Program: Write a program to accept 10 different numbers in array and sort in descending order.

```

#include<stdio.h>
#include<conio.h>
void main( )
{
    clrscr( );
    int array[10];
    int i, j;
    for (i=1; i<=10; i++)
    {
        printf(" Enter the data serially);
        scanf("%d",&array[i]);
    }
    int temp;
    for( i=1; i<=10; i++)
    {
        for (j=i+1; j<=10; j++)
        {
            if (array[i] < array[j])
            {
                Temp=array[i];
                array[i]=array[j];
                array[j]= temp;
            }
        }
    }
    printf("Sorting data in descending order\n");
    for( i=1; i<=10; i++)
    {
        printf("%d\n",array[i]);
    }
}

```

Program: Write a program to store twelve numbers in double dimensional array and print out the values in table with row wise addition.

```

#include<stdio.h>
#include<conio.h>
void main( )
{

```

```

int j, k;
int num[3][4]={1,2,3,4,8,10,11,5,9,6,2,8}
clrscr();
printf("Data stored \t\t sum\n");
for (j=1; j<=3; j++)
{
    int sum=0;
    for (k=1; k<=4; k++)
    {
        printf("%d \t",num[j][k]);
        sum=sum+num[j][k];
    }
    printf("=%d',sum);
    printf("\n");
}
}

```

Program: WAP to enter elements for 2x2 matrix and display its transpose.

```

#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    int a[2][2];
    int i,j;
    printf("\n Enter number for 2x2 matrices");
    for(i=0;i<2;j++)
    {
        for(j=0;j<2;j++)
        {
            printf("Enter number");
            scanf("%d",&a[i][j]);
        }
    }
    printf("\n Transpose of Matrix is");
    for(i=0;i<2;j++)
    {
        for(j=0;j<2;j++)
        {
            printf("%d",a[i][j]);
        }
        printf("\n");
    }
    getch();
}

```

Program: WAP to enter elements for 3x3 matrix and display its sum.

```

#include<stdio.h>
#include<conio.h>
void main()

```

```

{
clrscr();
int m1[3][3], m2[3][3],
int i,j;
printf("\n Enter number for 2x2 matrices");
for(i=0;i<3;j++)
{
for(j=0;j<3;j++)
{
printf("Enter number for first matrix");
scanf("%d",&m1[i][j]);
}
}
for(i=0;i<3;j++)
{
for(j=0;j<3;j++)
{
printf("Enter number for Second matrix");
scanf("%d",&m2[i][j]);
}
}

printf("\n Sum of Two Matrix is");
for(i=0;i<3;j++)
{
for(j=0;j<3;j++)
{
printf("%d",m1[i][j]+ m2[i][j]);
}
printf("\n");
}
getch();
}
}

```

Some important C programs

1. Reverse order
2. Factorial number
3. Fibonacci series
4. Prime or composite number
5. Even or odd number
6. Palindrome or not.
7. Sum of individual digits
8. Armstrong number or not
9. Multiplication table
10. Find list of prime number
11. Display perfect square number.

1. WAP to input any value and display the that value in reverse order.

```
# include<stdio.h>
# include<conio.h>
void main()
{
    int i,r,n,x;
    printf("enter a number");
    scanf("%d",&n);
    x=0;
    while(n>0)
    {
        r=n%10;
        x=x*10+r;
        n=n/10;
    }
    printf("/n reverse number is%d",x);
    getch();
}
```

2. WAP to input positive number and find its factorial number.

```
# include<stdio.h>
# include<conio.h>
void main()
{
    int i,n,f;
    printf("enter a number");
    scanf("%d", &n);
    if (n>0)
    {
        f=1;
        for(i=n;i>=1;i--)
        {
            f=f*i;
        }
        printf("/n The factorial value is %d",f);
    }
    else
    {
        printf("/n it is not a positive number");
    }
    getch();
}
```

3. WAP to display the Fibonacci series. 1 1 2 3 5 8 13n.

```
#include<stdio.h>
#include<conio.h>
void main()
```

```

{
  int i,n;
  int x,y,z;
  x=0,y=1,z=0;
  printf("Enter the number");
  scanf("%d",&n);
  for(i=1;i<n;i++)
  {
    printf("%d",z);
    z=x+y;
    x=y;
    y=z;
  }
  getch();
}

```

4.WAP read a number and to check the number is prime or not.

```

#include<stdio.h>
#include<conio.h>
void main()
{
  int i,num;
  i=2;
  printf("Enter the number");
  scanf("%d",&num);
  while(i<=num-1)
  {
    if(num%i==0)
    {
      printf("Not a prime number");
      break;
    }
    i++;
  }
  printf("number is prime");
  getch();
}

```

5.WAP to find out even number from 1 to 100 and find their sum also.

```

#include<stdio.h>
#include<conio.h>
void main()
{
  int i,sum=0;
  for(i=2; i<=100;i+2)
  {
    printf("\n Even number are %d",i);
    sum=sum+i;
  }
}

```



```

    }
    printf("\n Sum of even numbers is %d",sum);
getch();
}

```

6.WAP to input a number and find out that number is palindrome or not.

```

#include<stdio.h>
#include<conio.h>
void main()
{
    int a,n,r,x;
    x=0;
    printf("\n Enter the any number");
    scanf("%d",&n);
    a=n;
    while(n>0)
    {
        r=n%10;
        x=x*10+r;
        n=n/10;
    }
    if(a==x)
    {
        printf("Number is palindrome");
    }
    else
    {
        printf("Number is not palindrome");
    }
    getch();
}

```

7.WAP to input a positive number and find out the sum of its individual digits.

```

#include<stdio.h>
#include<conio.h>
void main()
{
    int i,r;n,x;
    printf("\n Enter a number");
    scanf("%d",&n);
    if(n>0)
    {
        x=0;
        while(n>0)
        {
            r=n%10;
            x=x+r;
            n=n/10;

```

```

    }
    printf("\n the sum of digits is %d",x);
    }
    else
    {
    printf("\n It is not a positive number");
    }
    getch();
}

```

8.WAP to input a number and check it is Armstrong number or not.

```

#include<stdio.h>
#include<conio.h>
void main()
{
    int i,r,n,x,a;
    printf("Enter a number");
    scanf("%d",&n);
    a=n;
    if(n>0)
    {
        x=0;
        while(n>0)
        {
            r=n%10;
            x=x+r*r*r;
            n=n/10;
        }
        if(a==x)
        {
            printf("\n Armstrong number is %d",a);
        }
        else
        {
            printf("\n Number is not Armstrong %d",a);
        }
    }
    else
    {
        printf("\n It is not positive number");
    }
    getch();
}

```

9.WAP to display the multiplication table of given number.

```

#include<stdio.h>
#include<conio.h>
void main()

```

```

        {
            int,i,n,m;
            printf("Enter the value ");
            scanf("%d",&n);
            for(i=1;i<=10;i++)
            {
                m=n*i;
                printf("\n %d * %d = %d",n,i,m);
            }
            getch();
        }

```

10.WAP to display all prime numbers upto 1000.

```

#include<stdio.h>
#include<conio.h>
void main()
{
    int n,r,j,i;
    for(j=1;j<=1000;j++)
    {
        for(i=2;i<j;i++)
        {
            if(j%i==0)
            {
                break;
            }
        }
        if(i==j)
        {
            printf("\t%d",j);
        }
        getch();
    }
}

```

11.WAP to display all perfect square numbers from 100 to 500.

```

#include<stdio.h>
#include<conio.h>
void main()
{
    int s,t;
    printf("The square numbers between 100 to 500 are");
    for(s=100;s<=500;s++)
    {
        for (t=1;t<=s;t++)
        {
            if(s==t*t)
            {
                printf("%d x %d = %d \n",s,s,t);
            }
        }
    }
}

```

```
    }  
    getch();  
}
```