

5.S

## Practical No. 1

Aim: Program to understand the basic datatypes & input/output.

Program 1: Area of rectangle

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int l, b, area;
    printf("Enter the number:");
    scanf("%d%d", &l, &b);
    area = l * b;
    printf("The area is %d");
    getch();
}
```

Output:

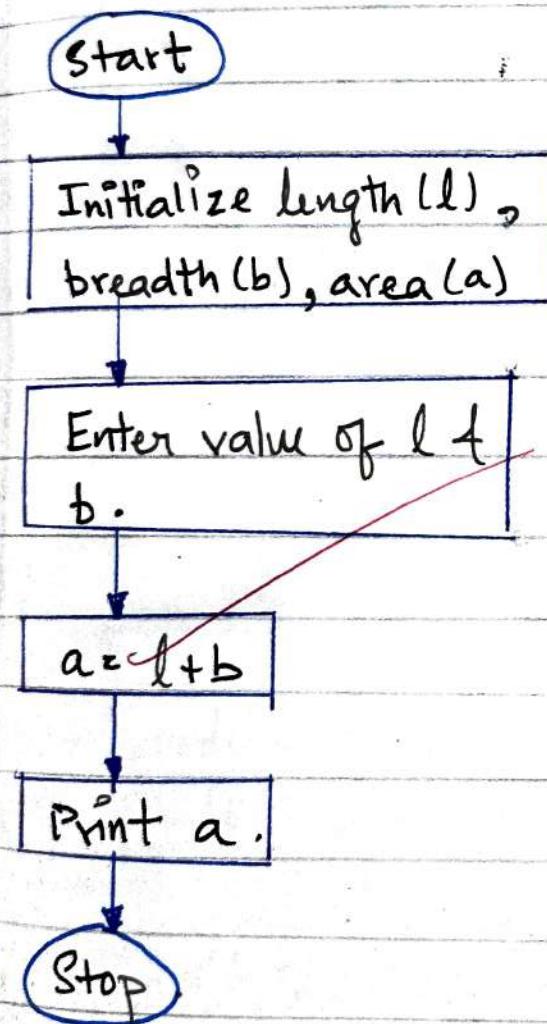
Program 1

Enter the number ( $l$ ) = 7

Enter the number ( $b$ ) = 58

The area is 406.

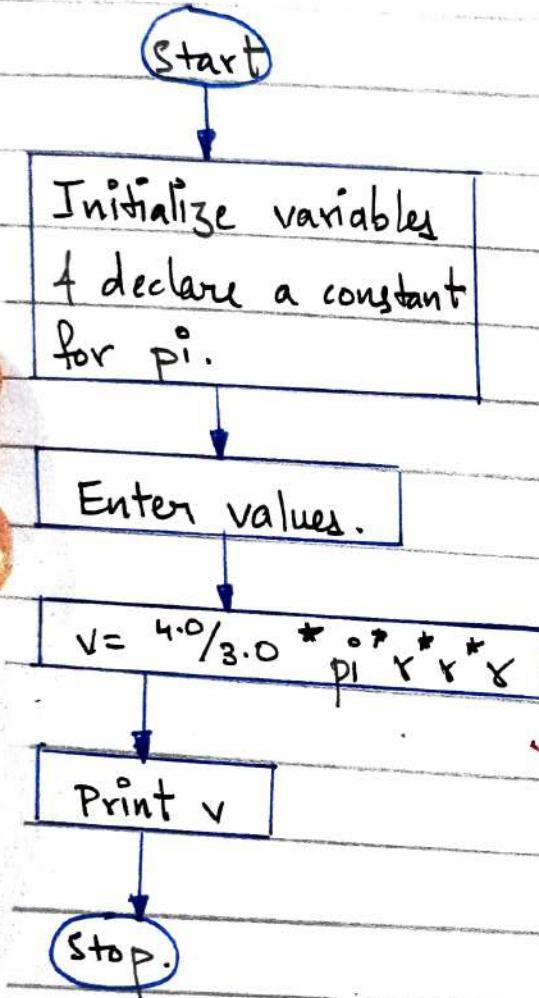
Program 1.



## Program 2

Enter the radius : 7

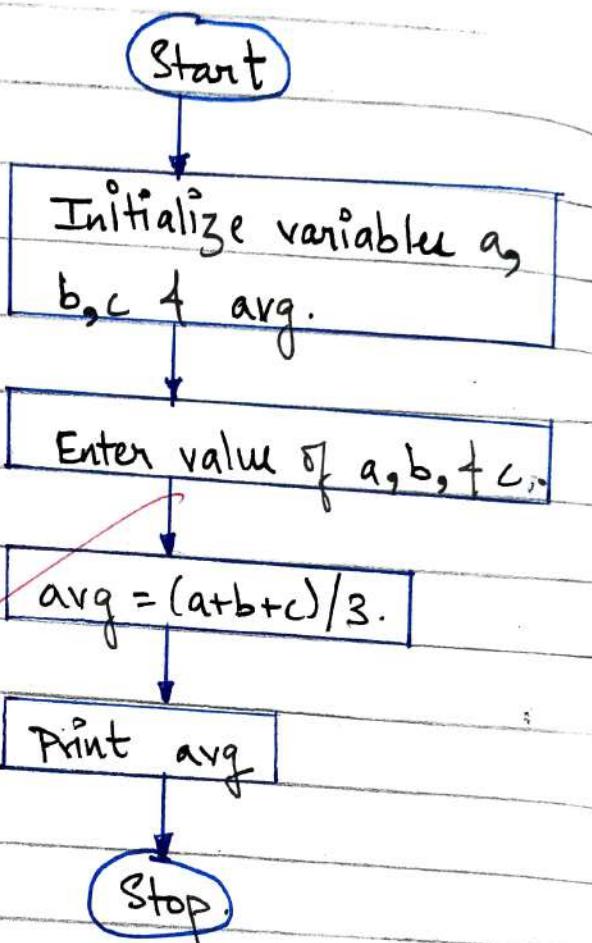
The volume is 1436.026733



## Program 3

Enter the number : 7, 9, 2

Avg : 6.0



Program 2 : Volume of sphere.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    float r, v, pi;
    printf("Enter the radius : ");
    scanf("%f", &r);
    pi = 3.14;
    v = 4.0 / 3.0 * pi * r * r * r;
    printf("The volume is : %f", v);
    getch()
}
```

Program 3 : Average of three numbers.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    float a, b, c, avg;
    printf("Enter the number : ");
    scanf("%f %f %f", &a, &b, &c);
    avg = (a+b+c)/3;
    printf("Avg : %f", avg);
    getch()
}
```

Q.S.

Program 4: Convert temperature from celsius to fahrenheit

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    float c,f;
    printf("Enter the value of celsius : ");
    scanf("%f", &c);
    f = (c * 9/5) + 32;
    printf("Fahrenheit : %.f", f);
    getch();
}
```

Program 5: Convert temperature from fahrenheit to celsius

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    float c,f;
    printf("Enter the value of fahrenheit : ");
    scanf("%f", &f);
    c = (5.0/9.0)*(f - 32);
    printf("celsius : %.f", c);
    getch();
}
```

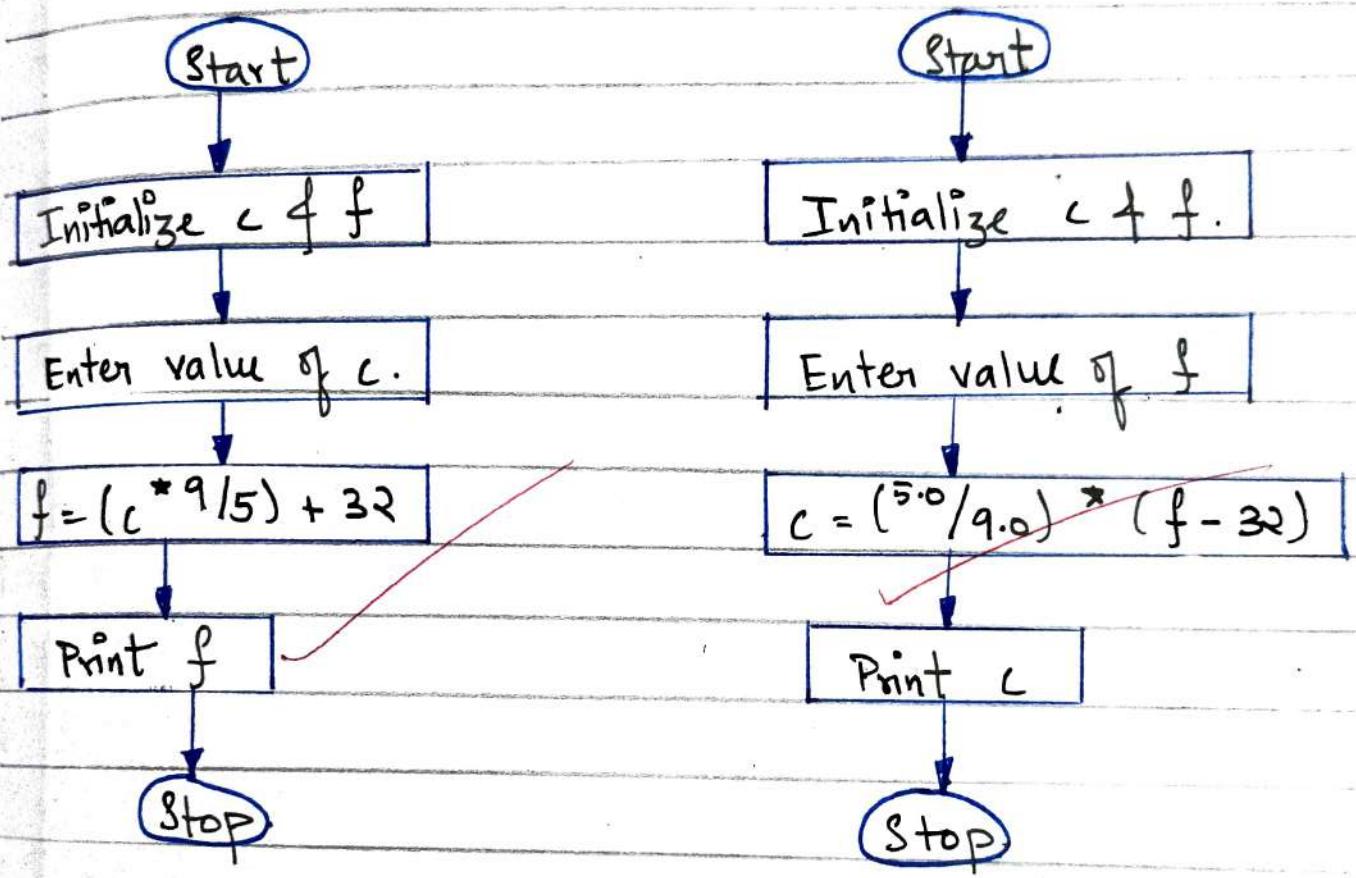
Output:

Program 4:

Enter the value of celsius: 3  
Fahrenheit : 37.400002

Program 5:

Enter the value of fahrenheit: 80  
Celsius : 26.666



Ex 03

Q8

Output :-

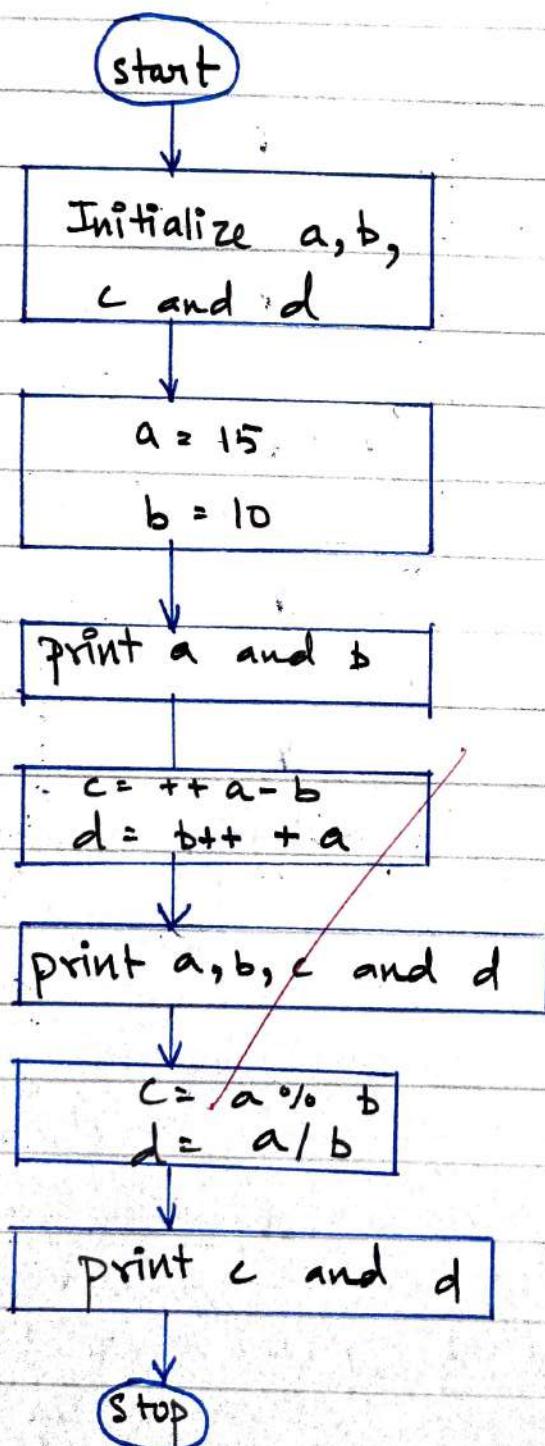
Program :-

$$a = 15, b = 10$$

$$a = 16 \quad b = 11 \quad c = 6 \quad d = 26$$

$$a \bmod b : 5$$

a divided by b : 1



## Practical No. 2

Aim : Programs on operations and expressions.

### Program 1 :-

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int a, b, c, d;
    a = 15, b = 10;
    printf ("\n a = %d b = %d", a, b);
    c = ++a - b;
    d = b++ + a;
    printf ("\n a = %d b = %d c = %d d = %d", a, b, c, d);
    c = a % b;
    d = a / b;
    printf ("\n a mod b : %d", c);
    printf ("\n a divided by b : %d", d);
    getch();
}
```

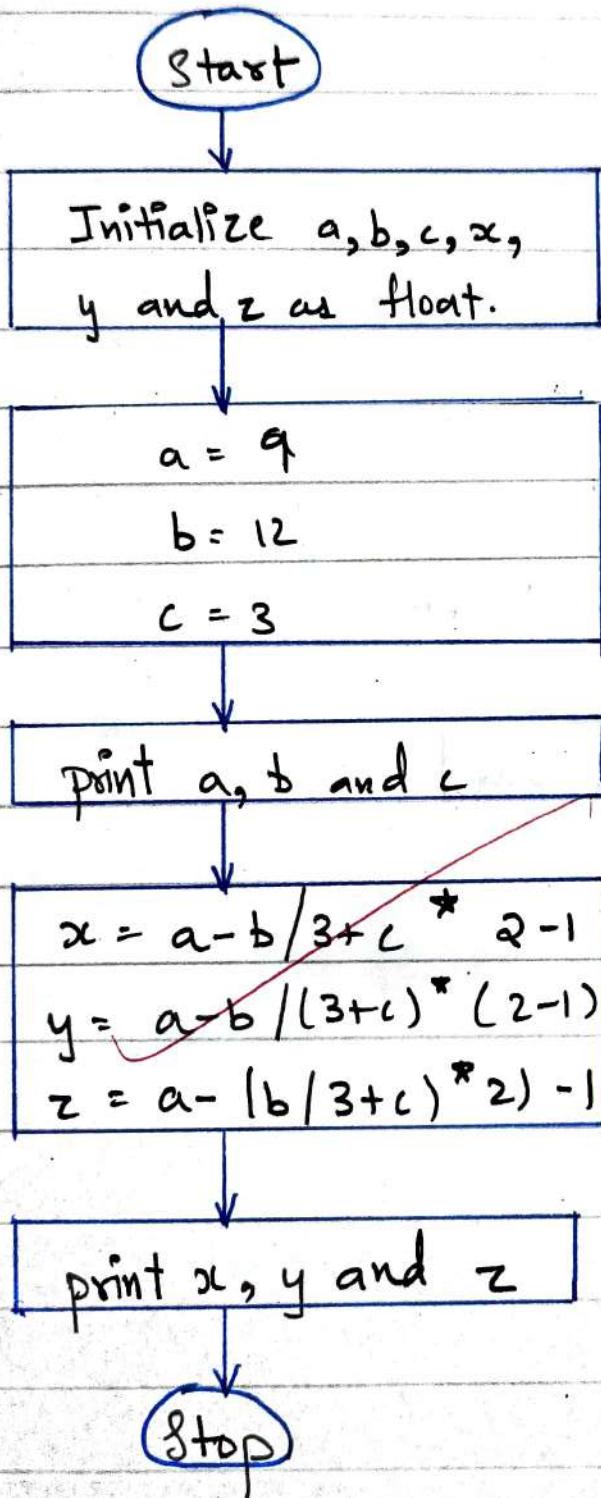
## Program 2 :-

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    float a, b, c, x, y, z;
    a = 9, b = 12, c = 3;
    printf("\n a=%f, b=%f c=%f", a, b, c);
    x = a - b / 3 + c * 2 - 1;
    y = a - b / (3 + c) * (2 - 1);
    printf("\n x=%f y=%f z=%f", x, y, z);
    getch();
}
```

Output :-

Program :-

$a = 9.0000000$     $b = 12.0000000$     $c = 3.0000000$   
 $x = 10.0000000$     $y = 7.0000000$     $z = 4.0000000$

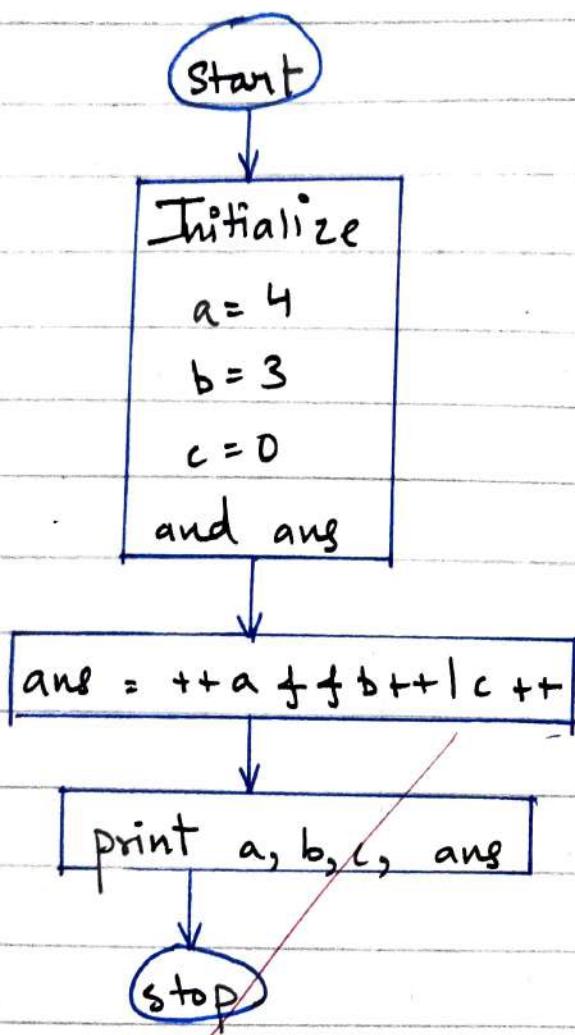


SB.

Output

Program 3

$$a = 5 \quad b = 4 \quad c = 1 \quad ans = 1$$



Program 3 :-

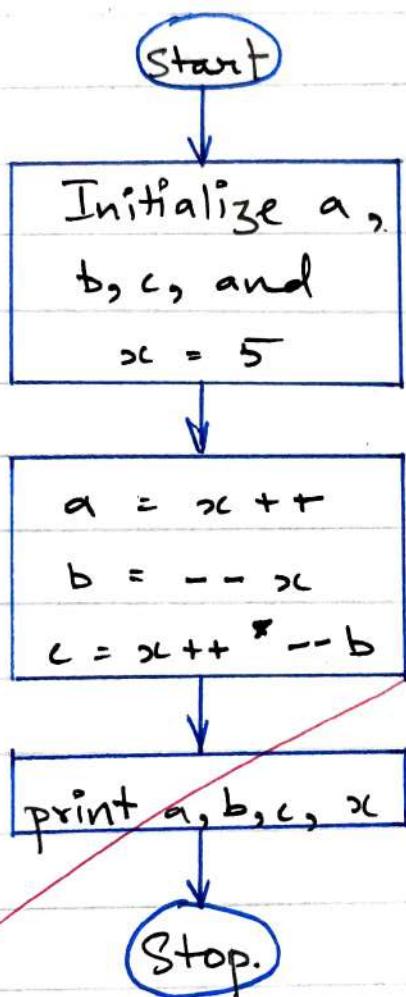
```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int a = 4, b = 3, c = 0, ans;
    ans = ++a + b++ + c++;
    printf("a=%d b=%d c=%d ans=%d", a, b, c, ans);
    getch();
}
```

## Program 4 :-

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int x=5, a,b,c;
    a = x++;
    b = --x;
    c = x++ * --b;
    printf("\n a=%d b=%d c=%d xc=%d", a, b, c, x);
    getch();
}
```

Output :-  
Program 4:-

$$a = 5 \quad b = 4 \quad c = 20 \quad x = 6.$$



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## Output

Enter value of n : 12

12 is even

Enter value of n : 51

51 is odd

### Practical No. 3

Aim: Programs on decision making and branching.

Program 1: Check whether number is odd or even.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int n, r;
    printf("\n Enter value of n:");
    scanf("%d", &n);
    r = n % 2;
    if (r == 0)
    {
        printf("\n %d is Even", n);
    }
    else
    {
        printf("\n %d is Odd", n);
    }
    getch();
}
```

Program 2 : Check if entered year is a leap year or not.

```
# include <stdio.h>
# include <conio.h>
void main()
{
    clrscr();
    int x, y;
    printf("\n Enter the year");
    scanf("%d", &y);
    x = y % 4;
    if (x == 0)
    {
        printf("\n %d is a leap year", y);
    }
    else
    {
        printf("\n %d is not a leap year", y);
    }
    getch();
}
```

Output

Enter the year 2001

2001 is not a leap year

Enter the year 2004

2004 is a leap year.

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Output

Enter the alphabet : i

i is a vowel

Enter the alphabet : s

s is a consonant.

Program 3 : Check whether entered alphabet is a vowel or consonant.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    char ch;
    printf("\n Enter the alphabet : ");
    ch = getch();
    if(ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u' ||
       ch == 'A' || ch == 'E' || ch == 'I' || ch == 'O' || ch == 'U')
    {
        printf("\n %c is a vowel", ch);
    }
    else
    {
        printf("\n %c is a consonant", ch);
    }
    getch();
}
```

Program 4: Print largest of three numbers using nested if.

```
# include <stdio.h>
# include <conio.h>
void main()
{
    clrscr();
    int a, b, c;
    printf("\n Enter value of a, b, c : ");
    scanf("%d %d %d", &a, &b, &c);
    if (a > b)
    {
        if (a > c)
        {
            printf("\n %d is largest", a);
        }
        else
        {
            printf("\n %d is largest", c);
        }
    }
    else
    {
        if (b > c)
        {
            printf("\n %d is largest", b);
        }
        else
        {
            printf("\n %d is largest", c);
        }
    }
    getch();
```

Output

Enter value of a, b, c : 5 9 1  
q is largest.

Q8  
Output :

Enter customer no f units consumed : 1 267

customer no : 1

units consumed : 267

bill amount : 935

Program 5 : To calculate electric bill using else if ladder.

Unit Consumed

Rate

1 - 100

Rs 2 per unit.

101 - 200

Rs 200 + Rs 4 per unit if above 100

201 - 300

Rs 600 + Rs 5 per unit if above 200

300 & above .

Rs 1100 + Rs 7 per unit if above 300.

```
#include <stdio.h>
```

```
#include <conio.h>
```

```
void main ()
```

```
{
```

```
clrscr();
```

```
int cno, unit, amount;
```

```
printf("\n Enter customer no & units consumed : ");
```

```
scanf("%d %d", &cno, &unit);
```

```
if (unit <= 100 && unit >= 0) {
```

```
    amount = unit * 2;
```

```
}
```

```
else if (unit <= 200 && unit > 100) {
```

```
    amount = 200 + (unit - 100) * 4;
```

```
}
```

```
else if (unit <= 300 && unit > 200) {
```

```
    amount = 600 + (unit - 200) * 5;
```

```
}
```

```
else if (unit > 300) {
```

```
    amount = 1100 + (unit - 300) * 7;
```

```
}
```

```
else {
```

```
    printf("\n Error");
```

```
}
```

```
printf("\n customer no : %d ", cno);
printf("\n units consumed : %d ", unit);
printf("\n bill amount : %d ", amount);
getch();
}
```

Program 6 : Program to enter single digit decimal number from keyboard and print that digit in word form.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int n;
    printf("\n Enter single digit decimal no : ");
    scanf("%d", &n);
    if (n == 0) {
        printf("\n Zero");
    }
    else if (n == 1) {
        printf("\n One");
    }
    else if (n == 2) {
        printf("\n Two");
    }
}
```

Output  
Input

Enter single digit decimal no : 1

One

Enter single digit decimal no : 15

Enter single digit number.

```
elseif (n == 3) {  
    printf ("\\n Three");  
}  
elseif (n == 4) {  
    printf ("\\n Four");  
}  
elseif (n == 5) {  
    printf ("\\n Five");  
}  
elseif (n == 6) {  
elseif (n == 6) {  
    printf ("\\n Six");  
}  
elseif (n == 7) {  
    printf ("\\n Seven");  
}  
elseif (n == 8) {  
    printf ("\\n Eight");  
}  
elseif (n == 9) {  
    printf ("\\n Nine");  
}  
else {  
    printf ("\\n Enter single digit number");  
}  
getch();  
}
```

Program 7: Program to perform addition, subtraction, multiplication and division using switch case.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int a, b, r, choice;
    printf("\n Select Your Operation");
    printf("\n 1. Addition");
    printf("\n 2. Subtraction");
    printf("\n 3. Multiplication");
    printf("\n 4. Division");
    printf("\n 5. Exit");
    scanf("%d", &choice);
    if (choice >= 1 && choice <= 4) {
        printf("\n Enter value of a and b:");
        scanf("%d %d", &a, &b);
    }
    switch (choice)
    {
        case 1:
            r = a + b;
            printf("\n %d + %d = %d", a, b, r);
            break;
    }
}
```

Output:

1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Exit.

Enter your choice = 3

Enter value of a & b : 5

10

$$5 * 10 = 50.$$

Case 2 :

```
y = a - b;
printf ("\\n %d - %d = %d ", a, b, y);
break;
```

Case 3 :

```
y = a * b;
printf ("\\n %d * %d = %d ", a, b, y);
break;
```

Case 4 :

```
y = a / b;
printf ("\\n %d / %d = %.d ", a, b, y);
break;
```

default ;

```
printf ("\\n No operation");
break;
```

}

getch();

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## Practical No. 4.

Aim : Programs to understand looping structures.

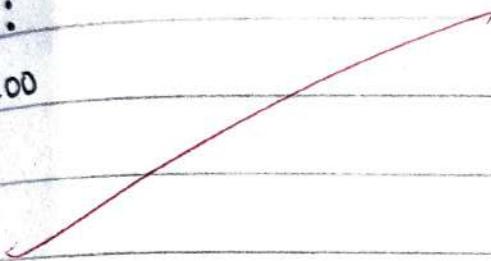
→ WHILE LOOP.

Program 1 : A program to print even numbers from 1 to 100

```
#include <stdio.h>
#include <conio.h>
void main ()
{
    clrscr();
    int i, r;
    i = 1;
    while (i <= 100)
    {
        r = i % 2;
        if (r == 0)
        {
            printf("\n%d", i);
        }
        i++;
    }
    getch();
}
```

Output:

2  
4  
6  
8  
10  
⋮  
⋮  
⋮  
100



Output :

Enter value of n : 70

7

14

21

28

35

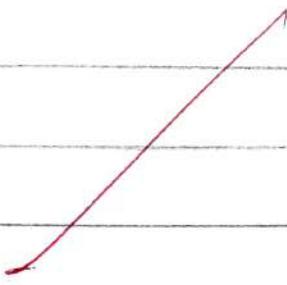
42

49

56

63

70



Program 2 : Print numbers between 1 to n which are divisible by 7.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int i, n, r;
    printf("\n Enter value of n: ");
    scanf("%d", &n);
    i = 1;
    while (i <= n)
    {
        r = i % 7;
        if (r == 0)
        {
            printf("\n %d", i);
        }
        i++;
    }
    getch();
}
```

Program 3: Program to obtain the following output.

1 2  
1 2 3  
1 2 3 4  
1 2 3 4 5

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int i, k;
    i = 1;
    while (i <= 5)
    {
        k = 1;
        while (k <= i)
        {
            printf("%d", k);
            ++k;
        }
        printf("\n");
        i++;
    }
    getch();
}
```

Output

1

1 2 ①

1 2 3 ◉

1 2 3 4

1 2 3 4 5

34

Output:

1

2 2

3 3 3

4 4 4 4

5 5 5 5 5

Program 4: Write a program to print the following output.

```

2
2 2
3 3 3
4 4 4 4
5 5 5 5 5

```

```

#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int i, k;
    i = 1;
    while (i <= 5)
    {
        k = 1;
        while (k <= i)
        {
            printf ("%d", i);
            ++k;
        }
        printf ("\n");
        i++;
    }
    getch();
}

```

⇒ DO WHILE.

Program 1 : Program to print sum of all even numbers between 1 to n.

```
#include <stdio.h>
#include <conio.h>
void main ()
{
    clrscr();
    int i, n, r, s;
    printf ("\n Enter value of n : ");
    scanf ("%d", &n);
    i = 1 ;
    s = 0 ;
    do
    {
        r = i % 2 ;
        if (r == 0)
        {
            s = s + i ;
        }
        i + + ;
    }
    while (i <= n) ;
    printf ("\n Sum of all even numbers between 1 to
            %d is %d", n, s);
    getch();
}
```

Output:

Enter value of n : 20

Sum of all even numbers between 1 to 20 = 110

84.1

Output:

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

→ For Loop

Program : Write a program to obtain the following output.

```
* *
* * *
* * * *
* * * * *
```

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int i, k;
    for (i=1, i <= 5, i++)
    {
        for (k=1, k <= i, k++)
        {
            printf("*");
        }
        printf("\n");
    }
    getch();
}
```

Program 2: Program to print the following output

1 2 3 4 5  
2 3 4 5  
3 4 5  
4 5  
5.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int i, k;
    for(i = 5, i >= 1; i--)
    {
        for(k = 1, k <= i, k++)
        {
            printf ("%d", k);
        }
        printf ("\n");
    }
    getch();
}
```

Output:

1	2	3	4	5	5	5	5	5
2	3	4	4	5	5	5	5	5
3	4	4	4	5	5	5	5	5
				5	5	5	5	5

Program 3: Fibonacci series of first 20 terms.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int a, b, i, f;
    printf ("\n fibonacci series : \n");
    a = 1;
    b = 0;
    printf ("\n %d", b);
    for (i = 3; i <= 20; i++)
    {
        f = a+b;
        printf ("\n %d", f);
        a = b;
        b = f;
    }
    getch();
}
```

Output  
series

## Fibonacci Series :

0  
1  
1  
2  
3  
5  
8  
13  
21  
34  
55  
89  
144  
233  
377  
610  
987  
1597  
2584

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Output :-

Enter 10 data of array :

1 2 3 4 5 6 7 8 9 10 11

largest = 11

## Practical No. 5

Aim: To understand the concept of arrays.

⇒ One dimensional arrays:

Program 1: Find the largest number in an array of 10 numbers.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int i, l, a[10];
    printf("\n Enter 10 data of array : ");
    for (i = 0; i < 10; i++)
    {
        scanf("%d", &a[i]);
    }
    l = a[0];
    for (i = 1; i < 10; i++)
    {
        if (l < a[i])
        {
            l = a[i];
        }
    }
    printf("\n largest: %d", l);
    getch();
}
```

Program 2 : Find the smallest number in an array of 10 elements :

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int i, s, a[10];
    printf("\n Enter 10 data of array : ");
    for (i = 0; i < 10; i++)
    {
        scanf("%d", &a[i]);
    }
    s = a[0];
    for (i = 1; i < 10; i++)
    {
        if (s > a[i])
        {
            s = a[i];
        }
    }
    printf("\n smallest : %.d", s);
    getch();
}
```

output.

Enter 10 data of array:

12 56 90 7 11 46 77 60 10 34.

smallest : 7

Output

Enter 10 data of array:

1 2 3 4 5 -6 7 -8 -9 -10

No. of positive no = 6.

Program 3 : Find number of positive numbers present in an array of 10 data:

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int i, c, a[10];
    printf("Enter 10 data of array")
    for (i = 0; i < 10; i++)
    {
        scanf("%d", &a[i]);
    }
    c = 0;
    for (i = 0; i < 10, i++)
    {
        if (a[i] > 0)
        {
            c = c + 1;
        }
    }
    printf("No. of positive no = %d", c);
    getch();
}
```

Program 4 : Find number of negative numbers present in an array of 10 data.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    printf("Enter 10 data of array:");
    for (i = 0; i < 10; i++)
    {
        scanf("%d", &a[i]);
    }
    c = 0;
    for (i = 0; i < 10; i++)
    {
        if (a[i] < 0)
        {
            c = c + 1;
        }
    }
    printf("No. of negative no = %d", c);
    getch();
}
```

Output

Enter 10 data of array :

-1 2 3 4 -5 -6 -7 8 9 -10

No. of negative no = 5.

88.

Output:

Enter 10 data of array:

1 2 3 4 5 6 7 8 9 10

No. of odd no = 5.

Program 5 : Write a program to find numbers of odd no. present in array of 10 data.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    int i, r, c, a[10];
    clrscr();
    printf("Enter 10 data of array : ");
    for (i = 0; i < 10; i++)
    {
        scanf("%d", &a[i]);
    }
    c = 0;
    for (i = 0; i < 10; i++)
    {
        r = a[i] % 2;
        if (r == 1)
        {
            c++;
        }
    }
    printf("No. of odd no = %d", c);
    getch();
}
```

Program 6: Find no. of even numbers.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    int i, r, c, a [10];
    clrscr();
    printf("\n Enter 10 data of array ");
    for (i = 0; i < 10; i++)
    {
        printf("%d", a[i]);
    }
    c = 0;
    for (i = 0; i < 10; i++)
    {
        r = a[i] % 2;
        if (r == 0)
            c++;
    }
    printf("\n No. of even no = %d", c);
    getch();
}
```

Output :

Enter 10 data of array :

1 2 3 4 5 6 7 8 9 10

No of even no. 5.

15

Output.

Enter 10 data of array:

1 2 3 4 5 6 7 8 9 10

Sum = 55

Average = 5.500000

Program 7 : Write a program to find average of 10 data of array.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int a[10], i, s;
    float avg;
    printf("Enter 10 data of array : ");
    for (i = 0; i < 10; i++)
    {
        scanf("%d", &a[i]);
    }
    s = 0;
    for (i = 0; i < 10; i++)
    {
        s = s + a[i];
    }
    avg = s / 10;
    printf("Sum = %d", s);
    printf("Average = %f", avg);
    getch();
}
```

Program 8 : To sort an array of 5 data in ascending order.

```
#include <stdio.h>
#include <conio.h>
Void main()
{
    clrscr();
    int a[5], i, k, t;
    printf("\n Enter 5 data into array: ");
    for (i=0; i<5; i++)
    {
        scanf("%d", &a[i]);
    }
    for (i=0; i<5; i++)
    {
        for (k=i+1; k<5; k++)
        {
            if (a[i]>a[k])
            {
                t = a[i];
                a[i] = a[k];
                a[k] = t;
            }
        }
    }
    printf("\n sorted array: ");
    for (i=0; i<5; i++)
    {
        printf("%d", a[i]);
    }
    getch();
}
```

Output  
Input

Enter elements of array :

2 6 5 1 4.

Sorted array in ascending order :

1 2 4 5 6

Output 88

Enter elements of array a:

5 6 7 8 9

Sorted array : 9 8 7 6 5

Program 9: Sort an array of 5 data in descending order.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int i, k, t, a[5];
    float avg;
    printf("\n Enter element into array a:");
    for (i = 0; i < 5; i++)
    {
        scanf("%d", &a[i]);
    }
    for (i = 0; i < 5; i++)
    {
        for (k = i + 1; k < 5; k++)
        {
            if (a[i] < a[k])
            {
                t = a[i];
                a[i] = a[k];
                a[k] = t;
            }
        }
    }
    printf("\n Sorted Array:");
    for (i = 0; i < 5; i++)
    {
        printf("%d", a[i]);
    }
    getch();
}
```

## ⇒ Two Dimensional Array :

Program 1 : To add two matrix each of size  $3 \times 3$ .

```
#include < stdio.h>
#include < conio.h>
void main()
{
    clrscr();
    int x[3][3], y[3][3], z[3][3];
    int r, c;
    printf("\n Enter elements of matrix x : ");
    for (r = 0; r < 3; r++) {
        for (c = 0; c < 3; c++) {
            scanf("%d", &x[r][c]);
        }
    }
    printf("\n Enter elements of matrix y : ");
    for (r = 0; r < 3; r++) {
        for (c = 0; c < 3; c++) {
            scanf("%d", &y[r][c]);
        }
    }
    for (r = 0; r < 3; r++) {
        for (c = 0; c < 3; c++) {
            printf(" %d ", z[r][c]);
        }
        printf("\n");
    }
    getch();
}
```

Output  
Number

Enter elements of matrix x : 0 1 2 3 4 5 6 7 8

Enter elements of matrix y : 0 1 2 3 4 5 6 7 8

Matrix z : 0 2 4  
              6 8 10  
              12 14 16

3

## Output

Enter elements of matrix x: 1 2 3 4 5 6 7 8 9

Enter elements of matrix y : 1 2 3 4 5 6 7 8 9

Matrix z : 30 36 42  
66 81 96  
102 126 150

Program 2 : Write a program to do matrix multiplication.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int x[3][3], y[3][3], z[3][3];
    int r, c, k, t;
    printf("\n Enter elements of matrix x:");
    for (r = 0; r < 3; r++)
    {
        for (c = 0; c < 3; c++)
        {
            scanf("%d", &x[r][c]);
        }
    }
    printf("\n Enter elements of matrix y:");
    for (r = 0; r < 3; r++)
    {
        for (c = 0; c < 3; c++)
        {
            scanf("%d", &y[r][c]);
        }
    }
    for (r = 0; r < 3; r++)
    {
        for (c = 0; c < 3; c++)
        {
            t = 0;
            for (k = 0; k < 3; k++)
            {
                t = t + x[r][k] * y[k][c];
            }
            z[r][c] = t;
        }
    }
    printf("\n Matrix Z:");
    for (r = 0; r < 3; r++)
    {
        for (c = 0; c < 3; c++)
        {
            printf("\t %d", z[r][c]);
        }
        printf("\n");
    }
    getch();
}
```

Program 3: Write a program to enter following table of marks and find row wise height.

Roll no.	Phy	Chem	Maths	Eng
1	10	15	12	14
2	19	18	16	17
3	17	20	11	14
4	18	16	19	12
5	20	12	11	19

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int r, c, h, m[5][4];
    printf("\n Enter table of marks : ");
    for (r=0 ; r<5 ; r++) {
        for (c=0 ; c<4 ; c++) {
            scanf("%d", &m[r][c]);
        }
    }
    for (r=0 ; r<5 ; r++) {
        h = m[r][0];
        for (c=1 ; c<4 ; c++) {
            if (h<m[r][c]) {
                h = m[r][c];
            }
        }
        printf("\n highest row %d", r, h);
    }
    getch();
}
```

Output:

Enter table of marks : 1 2 3 4 5 6 7 8 9 10 11 12 13 14  
15 16 17 18 19 20.

Highest is row 0 : 4

Highest row 1 : 0

Highest row 2 : 12

Highest row 3 = 16

Highest row 4: 20

1.9

Output :

Enter table of marks : 1 2 3 4 5 6 7 8 9 10 11  
12 13 14 15 16 17 18 19 20

Lowest is column no 4 : 17

Program 4: Write a program to find columnwise lowest.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int r, c, l, m[5][4];
    printf("\n Enter table of marks:");
    for (r=0; r<5; r++) {
        for (c=0; c<4; c++) {
            scanf("%d", &m[r][c]);
        }
    }
    for (r=1; r<5; r++) {
        if (l < m[r][c]) {
            l = m[r][c];
        }
    }
    printf("\n Lowest is column no. %d %d", c, l);
    getch();
}
```

Program 5: Write a program to print columnwise addition.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int r, c, total, m[5][4];
    printf("\n Enter table of marks :");
    for (r = 0; r < 5; r++) {
        for (c = 0; c < 4; c++) {
            scanf("%d", &m[r][c]);
        }
    }
    for (c = 0; c < 4; c++) {
        total = 0;
        for (r = 0; r < 5; r++) {
            total = total + m[r][c];
        }
    }
    printf("\n Total of column is : %d", c, total);
    getch();
}
```

Output  
sheet

Enter the table of marks.

1

2

3

4

Total no. of a column is 4

Total no. of 1 column is 6.

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03/03

70

Output. :

Enter text of word : My name is Fahad

Word 1 = My

Word 2 = name

Word 3 = is

Word 4 = Fahad.

Output. :

P

q

r

p

s

## Practical no. 6

Aim : Program using string functions.

Program 1 : To read string of words using scanf():

```
#include <stdio.h>
#include <string.h>
#include <conio.h>
void main()
{
    clrscr();
    char w1[20], w2[20], w3[20], w4[20];
    printf("\n Enter text of word : ");
    scanf("%s %s %s %s", +w1, +w2, +w3, +w4);
    printf("\n word1 = %s", w1);
    printf("\n word2 = %s", w2);
    printf("\n word 3 = %s", w3);
    printf("\n word 4 = %s", w4);
    getch();
}
```

Program 2 : Readline of text using putchar.

```
#include <stdio.h>
#include <conio.h>
#include <string.h>
void main()
{
    clrscr();
}
```

38.

```
char city [6] = "Paris";
int k;
for (k=0; k<5; k++) {
    putchar(city[k]);
    printf("\n");
}
getchar();
}
```

### Program 3 : Read line of text using gets()

```
#include <stdio.h>
#include <conio.h>
#include <string.h>
void main()
{
    clrscr();
    char l[20];
    print("\n Enter line of text : ");
    gets(l);
    puts(l);
    getch();
}
```

Output :-

Enter line of text : Hello World.

Hello world.

Output: 59

Enter line of text : My name is Fahad.  
My name is Fahad.

Program 4 : Read line of text using getch().

```
#include <stdio.h>
#include <conio.h>
#include <string.h>
void main()
{
    clrscr();
    char l[80], p;
    int k = 0;
    printf ("\n Enter line of text:");
    do {
        p = getch();
        l[k] = p;
        ++k;
    }
    while (p != '\n');
    --k;
    l[k] = '\0';
    printf ("\n %s", l);
    getch();
}
```

Program 5: Reverse a string using strrev():

```
#include <stdio.h>
#include <conio.h>
#include <string.h>
void main()
{
    clrscr();
    char h[10];
    printf ("\n Enter string :");
    scanf ("%s", h);
    strrev(h);
    printf ("\n Reverse string : %s", h);
    getch();
}
```

Output :

Enter string : Hello

Reverse String : olleH

SJ  
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Output:

Enter value of  $\pi$  : 5

Area = 78.50000

Circumference = 31.40000

Aim: Programs using USER-defined function.

Program 1: Area + Circumference of a circle.

```
#include <stdio.h>
#include <conio.h>
void circle (void);
void main()
{
    clrscr();
    circle();
    getch();
}

void circle(void)
{
    int r;
    float a, l;
    printf ("Enter value of r: ");
    scanf ("%d", &r);
    a = 3.14 * r * r;
    l = 2 * 3.14 * r;
    printf ("Area = %f", a);
    printf ("Circumference = %f", l);
}
```

Program 9: Print digits of the entered number.

```
#include <stdio.h>
#include <conio.h>
int get_no(void);
void main()
{
    clrscr();
    int m;
    m = get_no();
    printf ("\n Entered num = %d", m);
    getch();
}
int get_no(void)
{
    int num;
    printf (" Enter num:");
    scanf ("%d", &num);
    return (num);
}
```

Output :-

Enter num : 5

Entered num = 5

Output 45

Enter number : 31

Sum of digit = 4

Program 3: Sum of digits of entered numbers.

```
#include <stdio.h>
#include <conio.h>
void abc (int n);
void main()
{
    clrscr();
    int n;
    printf ("Enter number:");
    scanf ("%d", &n);
    abc(n);
    getch();
}
void abc (int n)
{
    int r, s = 0;
    while (n != 0)
    {
        r = n % 10;
        s = s + r;
        n = n / 10;
    }
    printf ("Sum of digits = %d", s);
}
```

Program 4: Average of 3 (entered numbers).

```
#include <stdio.h>
#include <conio.h>
void average (int, sum);
void sum (int a, int b, int c);
void main ()
{
    clrscr ();
    int x, y, z;
    printf ("Enter values of x, y, z");
    scanf ("%d %d %d", &x, &y, &z);
    sum (x, y, z);
    getch ();
}

void sum (int a, int b, int c)
{
    int s;
    s = a + b + c;
    average (s);
}

void average (int sum)
{
    float avg;
    avg = sum / 3.0;
    printf ("Average : %.f", avg);
}
```

Output.

Enter value of x, y, z: 4 6 9

Average = 6.333333

87

Output :

Enter value of  $x : 4$

Factorial of 4 : 24.

## Program 5: Factorial of number using RECURSION.

```
#include <stdio.h>
#include <conio.h>
int factorial (int n);
void main ()
{
    clrscr();
    int x, fact;
    printf ("\n Enter value of x : ");
    scanf ("%d", &x);
    fact = factorial(x);
    printf ("\n Factorial of %d = %d", x, fact);
    getch();
}

int factorial (int n)
{
    int f;
    if (n == 1) {
        return (1)
    }
    else {
        f = n * factorial (n-1);
        return (f)
    }
}
```

*By  
03/03*

1.5

## Practical No. 8

Aim: Programs On Structures.

Program 1: Student Structure.

```
#include <stdio.h>
#include <conio.h>
struct student
{
    int rollno;
    char name[20];
    int total;
};

void main()
{
    struct student x;
    clrscr();
    printf("\n Enter name, rollno & total of student:");
    scanf("%d %s %d", &x.rollno, &x.name, &x.total);
    printf("\n Roll no = %d", x.rollno);
    printf("\n Name = %s", x.name);
    printf("\n Total = %d", x.total);
    getch();
}
```

Output :

Enter rollno, name and total of student : 1835

Fahad

100

Roll no = 1835

Name = Fahad

Total = 100

25

Output :

Enter eno and salary : 5 20000

Enter eno and salary : 5 20000

both are equal

Enter eno and salary : 3 15000

Enter eno and salary : 4 25000

both are unequal

## Program 2: Employee Comparison

```

#include <stdio.h>
#include <conio.h>
struct employee
{
    int eno, salary;
};

void main()
{
    struct employee n, y;
    printf("nEnter eno & salary");
    scanf("%d %d", &n.eno, &n.salary);
    printf("nEnter eno & salary");
    scanf("%d %d", &y.eno, &y.salary);
    if (n.eno == y.eno & n.salary == y.salary)
    {
        printf("both are equal");
    }
    else
    {
        printf("both are unequal");
    }
    getch();
}

```

### Program 3: Fruit Structure

```

#include <stdio.h>
#include <conio.h>
struct fruit
{
    char name [20];
    int price, qty, total;
};

void main()
{
    struct fruit f [5];
    int k;
    clrscr();
    printf ("\n Enter name, price & qty : ");
    for (k=0; k<5; k++)
    {
        scanf ("%s %d %d", &f[k].name, &f[k].price, &f[k].qty);
        f[k].total = f[k].price * f[k].qty;
    }
    for (k=0; k<5; k++)
    {
        printf ("\n name = %s, price = %d, qty = %d",
               f[k].name, f[k].price, f[k].qty);
    }
    getch();
}

```

Output

Enter name, price and q'ty:

apple 20 5

mango 15 3

banana 50 9

cherry 30 7

grape 30 15

name = apple, price = 20, q'ty = 5

name = mango, price = 15, q'ty = 3

name = banana, price = 50, q'ty = 9.

name = cherry, price = 30, q'ty = 7.

name = grape, price = 30, q'ty = 15.

Output :-

Enter record of 5 players:

MS Dhoni India 100

Virat India 100

Rohit India 100

Shikhar India 100

Rahane India 100

Teamwise Players Names.

MS Dhoni India 100

Virat India 100

Rohit India 100

Shikhar India 100

Rahane India 100

## Program 4 : Cricketers and their teams

```

#include <stdio.h>
#include <conio.h>
#include <string.h>
struct cricket
{
    char pname[20], tname[20];
    int average;
};

void main()
{
    clrscr();
    struct cricket p[5], t;
    int i, k, x;
    printf("\n Enter records of 5 players : ");
    for(i=0; i<5; i++) {
        scanf("%s %s %d", p[i].pname, p[i].tname, &p[i].average);
    }
    for(i=0; i<4; i++) {
        for(k=i+1; k<5; k++) {
            x = strcmp(p[i].tname, p[k].tname);
            if (x > 0) {
                t = p[i];
                p[i] = p[k];
                p[k] = t;
            }
        }
    }
    printf("\n teamwise player names \n");
    for (i=0; i<5; ++i) {
        printf("\n %s %s %d \n", p[i].pname, p[i].tname, p[i].average);
    }
}

```

## Program 5 : Structure within structure.

```

#include <stdio.h>
#include <conio.h>
struct employee
{
    int salary;
};

struct employee {
    int id;
    char name[10];
    struct employee b2;
};

void main()
{
    clrscr();
    int i;
    struct employee s = {22, "prakash", {500}};
    printf("\n Rollno= %d \t Name = %s \t salary = %d",
        s.id, s.name, s.b2.salary);
    getch();
}

```

Output :

Roll no = 22

Name = Fahad

Salary = 500

03/03

Output: <sup>e78</sup>

$$a = 12$$

$$b = 4$$

$$x = 42$$

$$y = 42$$

Aim: Programs on pointers in C-language.

### # Program 1:

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int a=12, b=4, x, y, *p, *q;
    p = &a;
    q = &b;
    x = *p + *q - b;
    y = 4 * (*p - *q) + 10;
    printf("\n a=%d", a);
    printf("\n b=%d", b);
    printf("\n x=%d", x);
    printf("\n y=%d", y);
    getch();
}
```

Program 2:-

```
#include <stdio.h>
#include <conio.h>
void main()
{
    clrscr();
    int x[5] = {10, 20, 30, 40, 50}
    int *p; i, sum = 0;
    p = fx[0];
    for (i=0; i<5; i++) {
        sum = sum + *p;
        p = p + 1;
    }
    printf("\n sum = %d", sum);
    getch();
}
```

Program 3 : Pointers as function argument.

```
#include <stdio.h>
#include <conio.h>
void change(int *p);
void main()
{
    clrscr();
    int x = 20;
    change(&x);
    printf("\n x= %d", x);
    getch();
}
```

```
void main(int *p)
{ *p = *p + 10; }
```

Output :

$$\text{Sum} = 150$$

Output :

$$x = 30.$$

18

Output :-

Before exchange  $x = 10 \quad y = 20$

After exchange  ~~$x = 20 \quad y = 10.$~~

### Program 5.4:

```

#include <stdio.h>
#include <conio.h>
void exchange(int *a, int *b);
void main()
{
    int x, y;
    x = 10;
    y = 20;
    printf("\n Before exchange : x = %d y = %d", x, y);
    exchange(&x, &y);
    printf("\n After exchange : x = %d y = %d", x, y);
    getch();
}

void exchange(int *a, int *b)
{
    int t;
    t = *a;
    *a = *b;
    *b = t;
}

```

Program 5 :- Arrange array in ascending order using pointers.

```
#include <stdio.h>
#include <conio.h>
void main()
{
    int x[5] = { 17, 15, 18, 12, 14 };
    int * p, * q, i, k, t;
    clrscr();
    p = &x[0];
    for(i = 0; i < 4; ++i) {
        q = p + i;
        for(k = i + 1; k = 4; ++k) {
            if (*p > *q) {
                t = *p;
                *p = *q;
                *q = t;
            }
            ++q;
        }
        ++p;
    }
    printf ("\n Sorted array");
    p = &x[0];
    for(i = 0; i < 5; ++i) {
        printf ("\n %d", *p);
        p++;
    }
    getch();
}
```

Output :

Sorted array

12

14

15

17

18

18/8

Output :-

Opening the file in test.c in write mode.

Enter some text from keyboard to write in file test.c

Hi! How are you doing?

Closing the file test.c.

Ques : Programs on file handling.

Program 1 : Open file → write & close file.

```
# include <stdio.h>
# include <conio.h>
# include <string.h>
int main()
{
FILE fp;
char data [50];
printf("opening the file test.c in write mode");
fp = fopen ("test.c", "w");
if (fp == NULL)
{
    printf("could not open file test.c");
    return 1;
}
printf("\n Enter some text from keyboard to write in file");
while (scanf (gets (data)) > 0)
{
    fputs (data, fp);
    fputs ("\n", fp);
}
printf("closing the file test.c");
fclose (fp);
return 0;
}
```

Program 2 : File opening → Reading & closing of file:

```
#include <stdio.h>
#include <conio.h>
int main()
{ FILE * fp;
char data[50];
printf ("Opening the file test.c in read mode");
fp = fopen ("test.c", "r");
if (fp == NULL) {
    printf ("Could not open file test.c");
    return 1;
}
printf ("Reading the file test.c");
while (fgets (data, 50, fp) != NULL)
printf ("Closing the file test.c");
fclose (fp);
return 0;
```

Program 3 : Using putw() & getw() functions.

```
#include <stdio.h>
int main()
{ FILE * fp;
int i=1, j=2, k=3, num;
fp = fopen ("test.c", "w");
putw(i, fp);
putw(j, fp);
putw(k, fp);
fclose (fp);
fp = fopen ("test.c", "r");
while (getw (fp) != EOF)
```

Output :

Opening the file test.c in read mode.

Reading the file test.c.

Hi! How are you doing?

Closing the file test.c.

Output :

Data in test.c file is

1

2

3

Q8

Output :-

Opening the file test.c in read mode.

Reading the file test.c

Hi! How are you doing?

Closing the file test.c

## Program 4: fgetc() function.

```
#include <stdio.h>
int main()
{
FILE *fp;
char c;
printf("Opening the file test.c in read mode");
fp = fopen ("test.c", "r");
printf("Reading the file test.c");
while(1)
{
c = fgetc(fp);
if(c == EOF) {
break;
printf("%c", c);
}
printf("closing the file test.c");
fclose(fp);
return 0;
}
```

## Program 5 : fputc() function.

```
#include <stdio.h>
int main()
{
    char ch;
    FILE * fp1;
    FILE * fp2;
    if (fp1 = fopen ("test1.c", "r"));
        ch = getc (fp1);
    fp2 = fopen ("test2.c", "w+");
    while (ch != EOF) {
        fputc (ch, fp2);
        ch = getc (fp1); }
    fclose (fp1);
    fclose (fp2);
    return 0;
}
return 1;
}
```

Output :-

No output produced !

Output :-

Opening the file test.c in read mode.

Reading the file test.c

Hi! How are you doing?

Closing the file test.c as end of file is reached.

Output :-

Enter some character (\$ to exit)

A

Entered character is : A.

B

Entered character is : B.

\$

Entered character is : \$

Program 6 : fEOF() function

```
#include <stdio.h>
int main () {
FILE *fp;
char c;
printf ("Opening the file test.c in read mode");
printf ("Reading the file test.c");
while (1) {
c = fgetchar (fp);
if (fEOF (fp)); {
break;
printf ("%c", c);
printf ("Closing the file test.c as end of file is reached");
fclose (fp);
return 0;
}
}
```

Program 7 : fgetchar() function

```
#include <stdio.h>
#include <cctype.h>
int main ()
{ char c;
printf ("Enter some character ($ to exit) \n");
while (c != '$');
{ c = fgetchar ();
printf ("\n Enter character is : ");
putchar (c);
printf ("\n")
}
return 0;
}
```

Program 8 : fscanf(), printf(), ftell(), rewind() function

```
#include <stdio.h>
int main()
{
    char name[20];
    int age, length;
    FILE *fp;
    fp = fopen("text.txt", "w");
    printf(fp, "%s %d", "Fresh2refresh", 5);
    length = ftell(fp);
    rewind(fp);
    fscanf(fp, "%d", &age);
    fscanf(fp, "%s", &name);
    fclose(fp);
    printf("Name : %s \n Age : %d \n", name, age);
    printf("Total number of characters in file is %d", length);
    return 0;
}
```

Program 9 : fputchar() function

```
#include <stdio.h>
int main()
{
    clrscr();
    char ch = 'a';
    while (ch <= 'z') {
        fputchar(ch);
        ch++;
    }
    return 0;
}
```

89

Output 1 :

Name : Fresh & refresh.

age : 5

total number of characters in file is 15

Output 2

abcdefghijklmno

qrstuvwxyz .

80  
03/03