Far-Western university

Department of engineering

LAB REPORT

Programming in c

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Q1: Write a program to display hello world.

Algorithm:-

Step 1: start
Step 2: display hello world
Step 3: stop

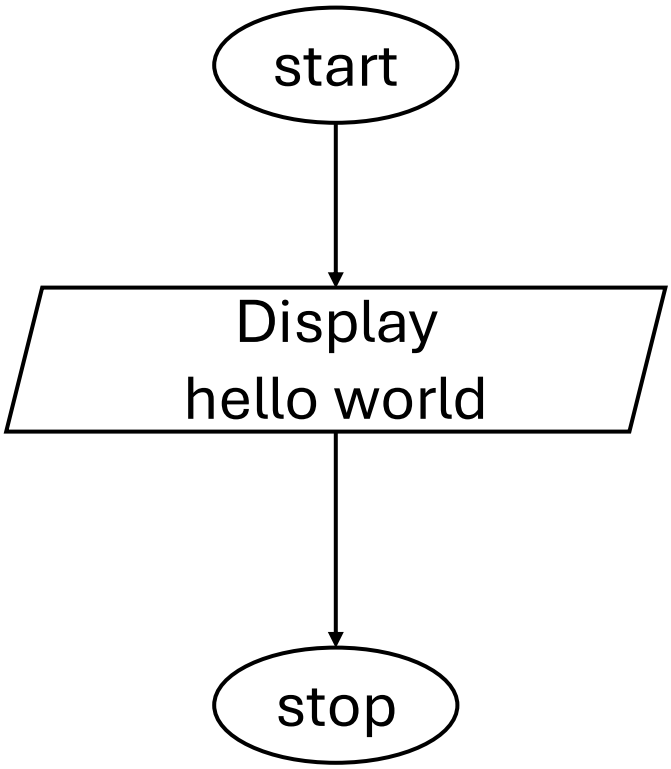
code:-

```c
#include<stdio.h>

int main(){
    printf("hello world");
return 0;
}
```

Output:-

Hello world

Flow chart:-



Q2: write a program to calculate simple interest.

Algorithm:-

Step 1: start
Step 2: declare variables I,p,t and r
Step 3: input value of p, t, r
Step 4: calculate simple interest, I=(p*t*r)/100
Step 5: display value of I
Step 6: stop

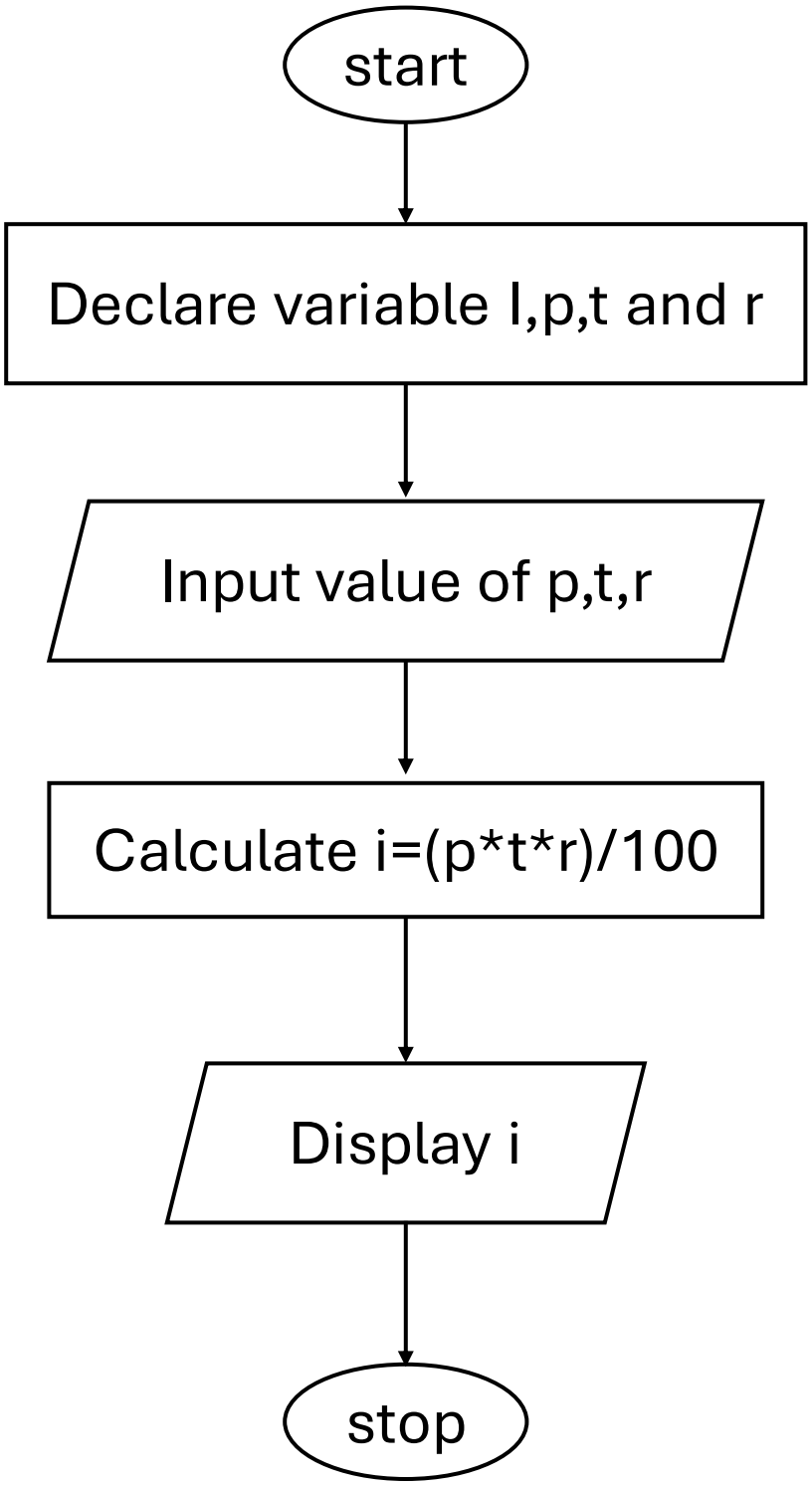
code:-

```c
#include<stdio.h>

int main(){
    int p,t,r,i;
    printf("enter value of p,t,r");
    scanf("%d%d%d",&p,&t,&r);
    i = (p*t*r)/100;
    printf("interest: %d",i);
return 0;
}
```

Output:-

Enter value of p,t,r 100 10 10
Interest: 100

Flow chart:-


start
Declare variable I,p,t and r
Input value of p,t,r
Calculate i=(p*t*r)/100
Display i
stop

Q3: Write a program to show use of various operators.

Algorithm:-

Step 1: start
Step 2: input any 5 numbers, a=8, b=2, c=3, d=5, e=7
Step 3: perform all arithematic operations, +, -, *, /, %
Step 4: perform relational operation using a,b,c,d,e
Step 5: perform logical operation using a,b,c,d,e
Step 6: display the result
Step 7: stop

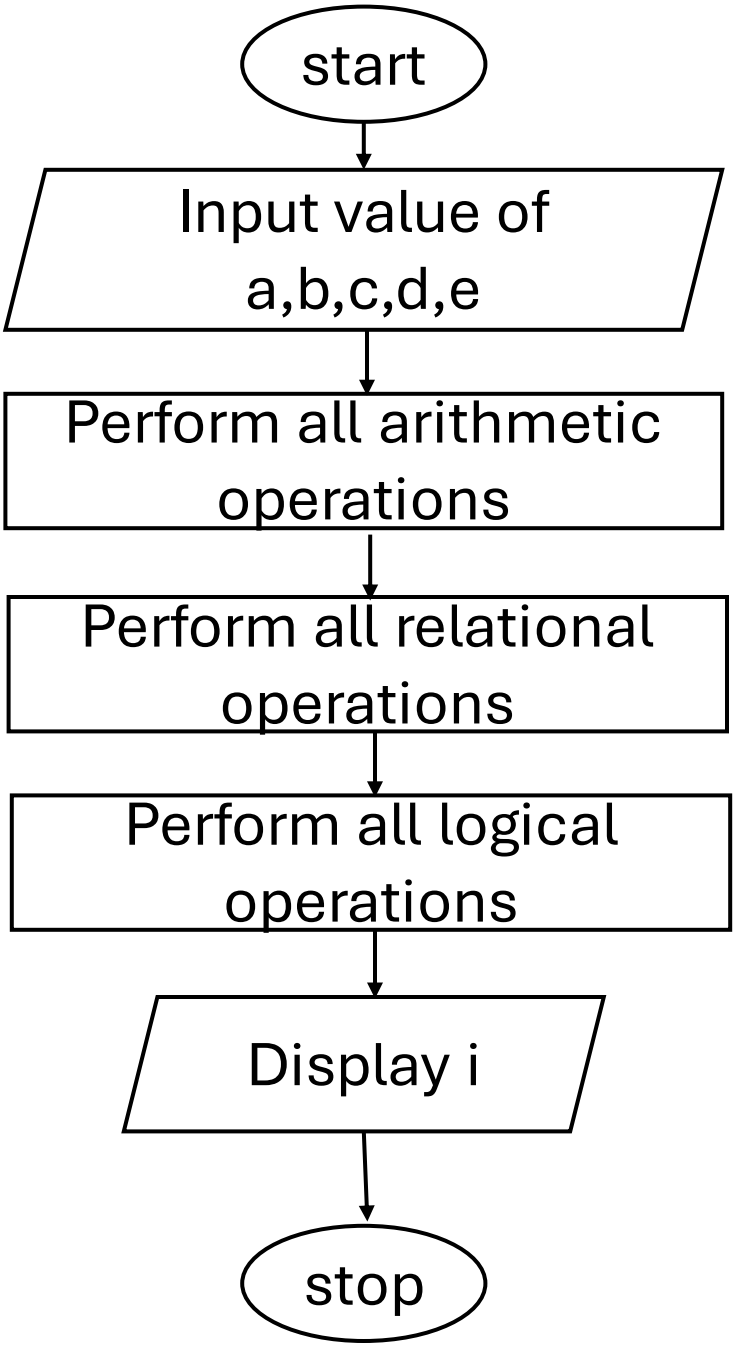
code:-

```c
#include<stdio.h>

int main(){
    int a=8, b=2, c=3, d=5, e=7;

    printf("a + b = %d\n", a+b);
    printf("a - b = %d\n", a-b);
    printf("a * b = %d\n", a*b);
    printf("a / b = %d\n", a/b);
    printf("a % b = %d\n", a%b);
    printf("c < d = %d\n", c<d);
    printf("c > d = %d\n", c>d);
    printf("c ⩽ d = %d\n", c⩽d);
    printf("c ⩾ d = %d\n", c⩾d);
    printf("a>b && c>b = %d\n", a>b&&c>d);
    printf("a>b || c>b = %d\n", a>b||c>d);
    printf("not (a⩾b) = %d", !(a⩾b));

return 0;
}
```

Output:-

```
a + b = 10
a - b = 6
a * b = 16
a / b = 4
a b = 0
c < d = 1
c > d = 0
c <= d = 1
c >= d = 0
a>b && c>b = 0
a>b || c>b = 1
not (a>=b) = 0
```

Flow chart:-


start
Input value of a,b,c,d,e
Perform all arithmetic operations
Perform all relational operations
Perform all logical operations
Display i
stop

Q4: WAP to print integers and different real numbers using different format specifiers.

Algorithm:-

Step 1: start
Step 2: Declare the variable a and b
step 3: Input the value of a and b
step 4: Perform the different cases
using different format specifiers.
step 5: Display the result
step 6: stop

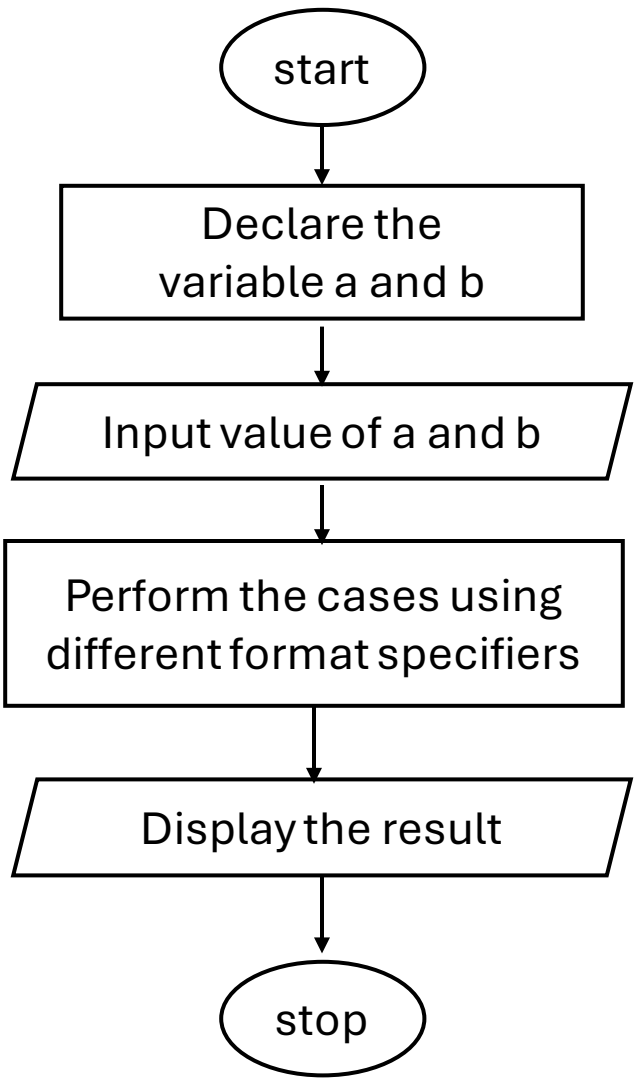
code:-

```c
#include<stdio.h>

int main(){
    int a=12345;
    float b=678.123;

    printf("case 1 a=%d\n",a);
    printf("case 2 a=%10d\n",a);
    printf("case 3 a=%-10d\n",a);
    printf("case 4 a=%012d\n",a);
    printf("case 5 b=%f\n",b);
    printf("case 6 b=%15.2f\n",b);
    printf("case 7 b=%015.3f\n",b);
    printf("case 8 b=%-16.3f\n",b);

return 0;
}
```

Output:-

```
case 1 a=12345
case 2 a=     12345
case 3 a=12345
case 4 a=000000012345
case 5 b=678.122986
case 6 b=       678.12
case 7 b=00000000678.123
case 8 b=678.123
```

Flow chart:-

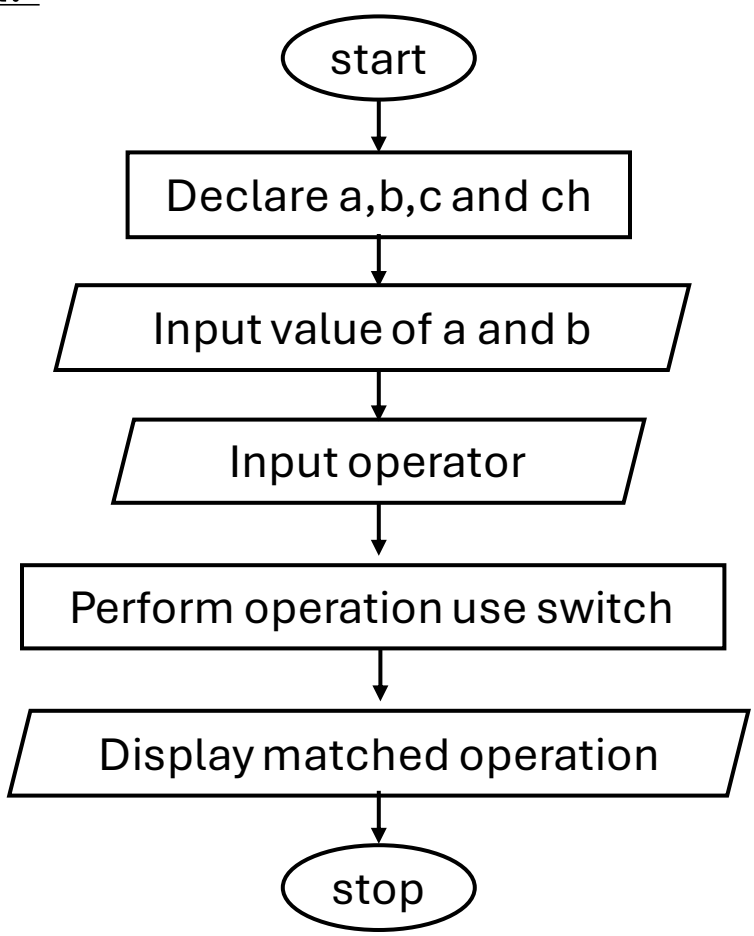


Q5: WAP that ask 1 operator and 2 operands and perform corresponding operation

Algorithm:-

Step 1: start
Step 2: Declare variable a, b, c and ch
Step 3: Input value of a and b
Step 4: Input arithmetic operator
Step 5: Perform arithmetic operation use switch
Step 6: Display operation matched
Step 7: stop

Flow chart:-



code:-

```c
#include<stdio.h>

int main(){
    char ch;
    int a,b,c;

    printf("enter two integers: ");
    scanf("%d%d",&a,&b);
    printf("enter arithematic operator (+,-,*,/,): ");
    scanf(" %c",&ch);

    switch (ch)
    {
    case '+':
        printf("sum = %d", a+b);
        break;
    case '-':
        printf("difference = %d", a-b);
        break;
    case '*':
        printf("product = %d", a*b);
        break;
    case '/':
        printf("quotient = %f", (float)a/b);
        break;
    default:
        printf("wrong operator:");
        break;
    }
return 0;
}
```

Output:-

enter two integers: 10 5
enter arithmetic operator (+,-,*,/,): +
sum = 15

Q6: WAP to display multiplication table of given number

Algorithm:-

Step 1: start
Step 2: declare variable a and i
step 3: Input the value of a and i=1
step 4: perform product of a*i
step 5: increment I and goto step 4 until i<=10
step 6: display multiplication table
Step 7: stop

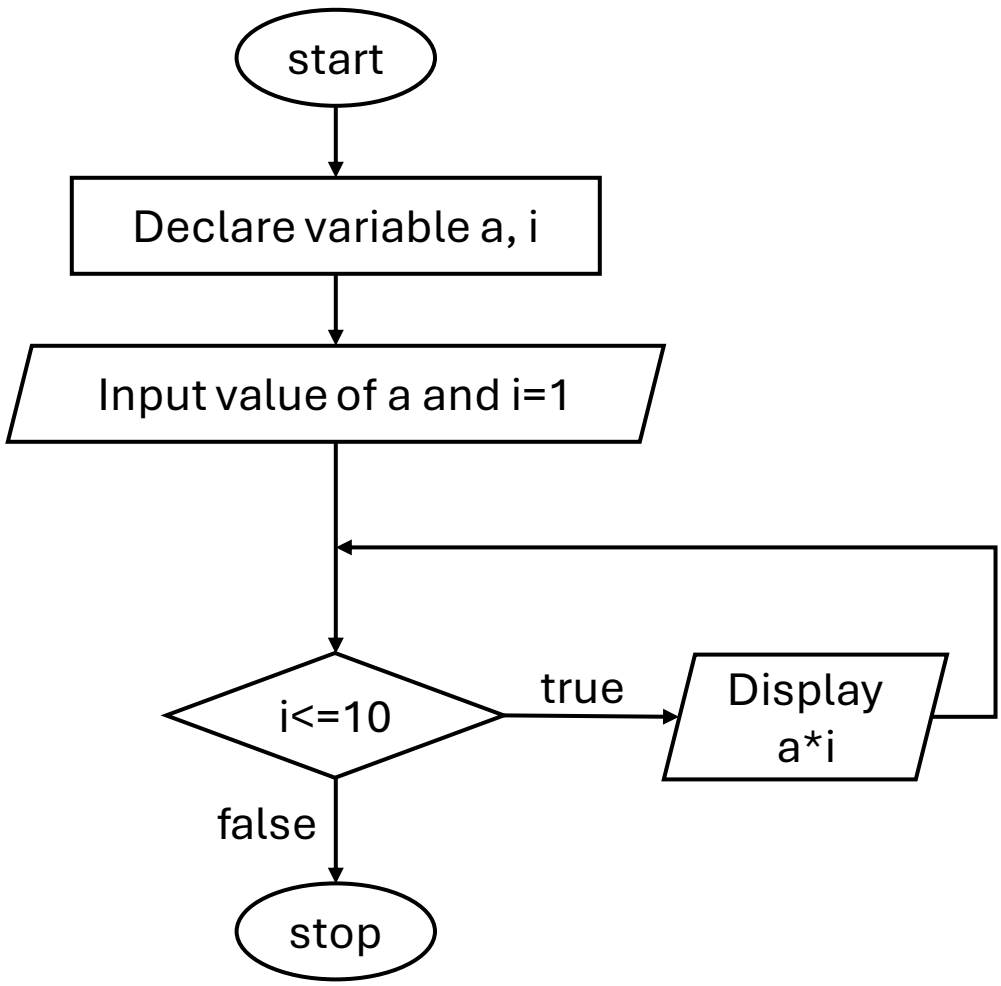
code:-

```c
#include<stdio.h>

int main(){
    int a;
    printf("enter any number: ");
    scanf("%d",&a);
    for (int i = 1; i ⩽ 10; i++)
    {
        printf("%d x %d = %d\n",a,i,a*i);
    }
return 0;
}
```

output:-

enter any number: 5
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50

Flow chart:-



Q7: WAP to calculate factorial of number

Algorithm:-

Step 1: start
Step 2: declare variable n,i and fact
step 3: Input the value of n and i=1
step 4: calculate, fact*=I
step 5: increment I and go to step 4 until i<=n
step 6: display fact
Step 7: stop

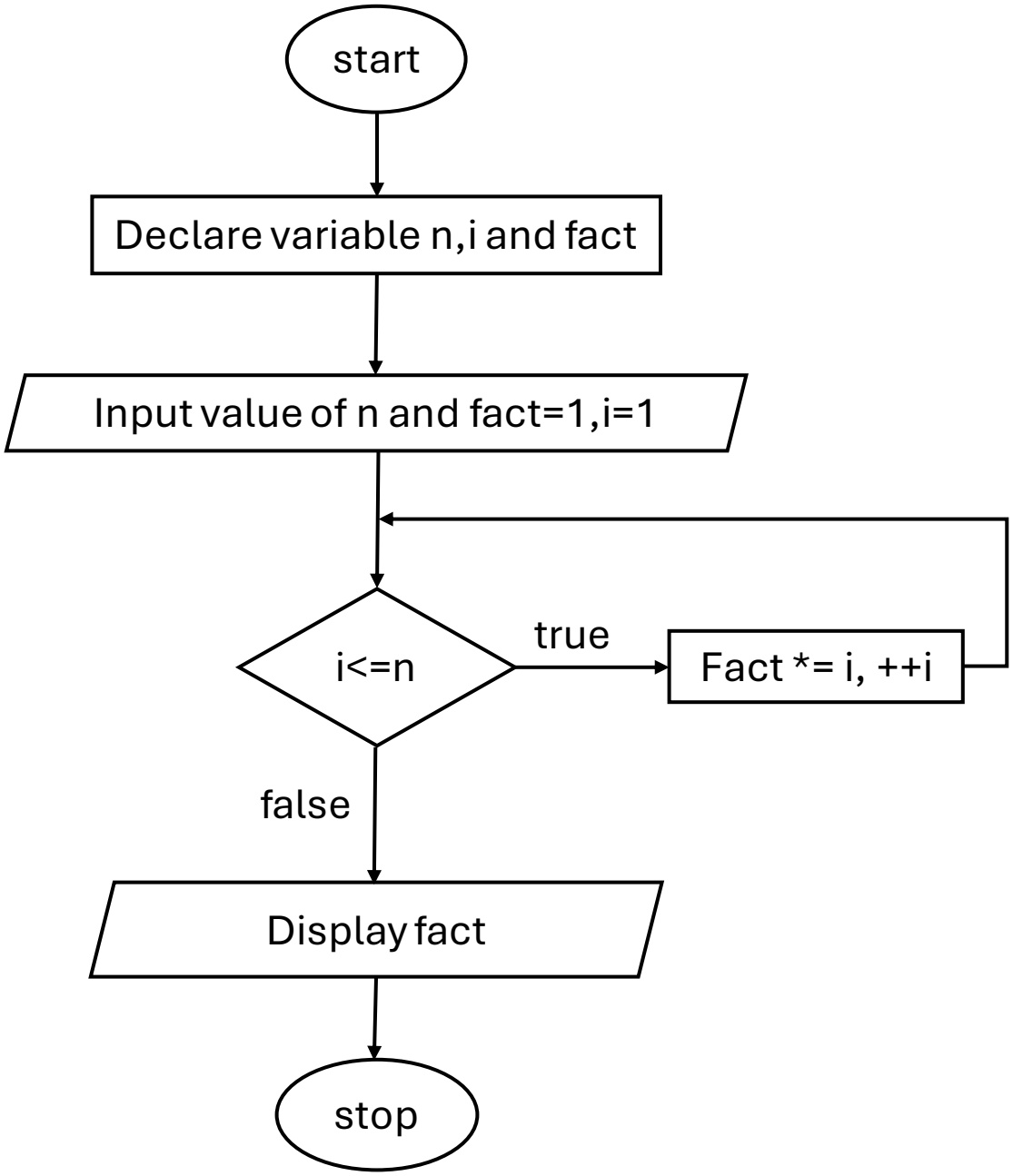
code:-

```
#include<stdio.h>

int main(){
    int n,fact=1;
    printf("enter number: ");
    scanf("%d",&n);
    for (int i = 1; i ⩽ n; ++i)
    {
        fact *= i;
    }
    printf("factorial: %d",fact);
return 0;
}
```

output:-

```
enter number: 3
factorial: 6
```

Flow chart:-


start
Declare variable n,i and fact
Input value of n and fact=1,i=1
i<=n
true
Fact *= i, ++i
false
Display fact
stop

Q8: WAP to calculate sum of 2 numbers using pass by value of function

Algorithm:-

Step 1: start
Step 2: declare variable a,b and c
step 3: Input the value of a and b
step 4: calculate c=sum(a,b)
step 5: display c
step 6: stop

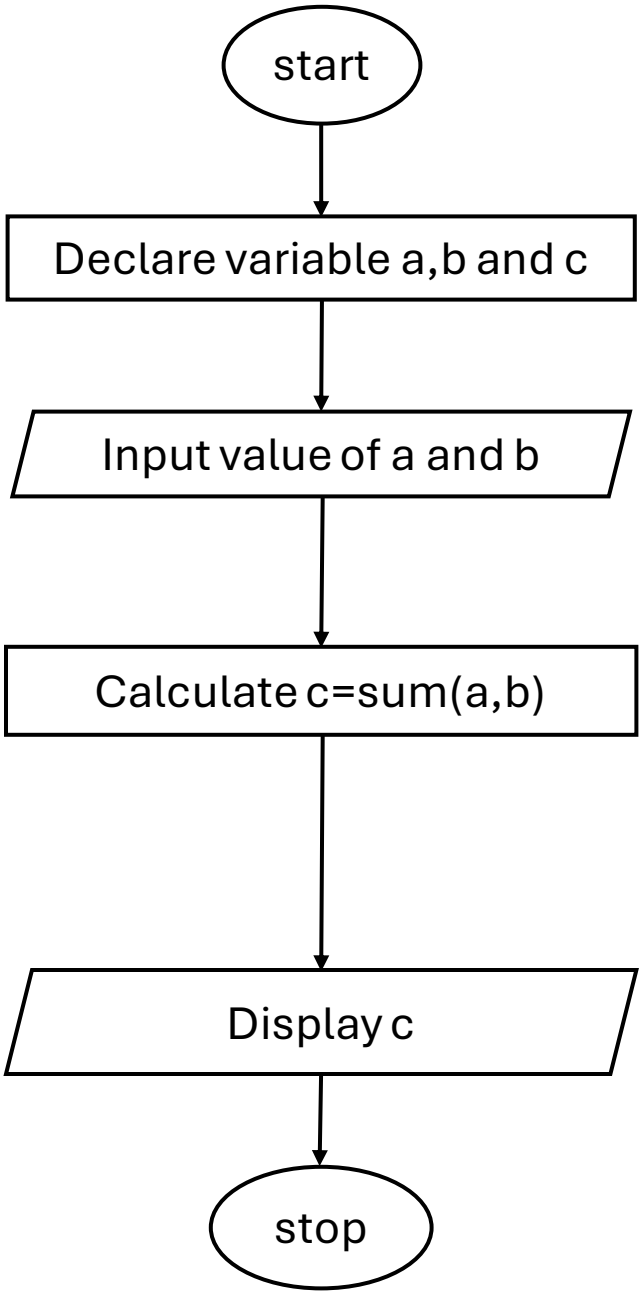
code:-

```c
#include<stdio.h>

int sum(int,int);

int main(){
    int a,b,c;
    printf("enter value of a and b: ");
    scanf("%d%d",&a,&b);
    c=sum(a,b);
    printf("sum: %d",c);
return 0;
}

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

output:-

```
enter value of a and b: 5 6
sum: 11
```

Flow chart:-


start
Declare variable a,b and c
Input value of a and b
Calculate c=sum(a,b)
Display c
stop

Q9: WAP to swap 2 numbers using pass by referance of function

Algorithm:-

Step 1: start
Step 2: declare variable a and b
step 3: Input the value of a and b
step 4: execute swap(&a,&b)
step 5: display swapped values
step 6: stop

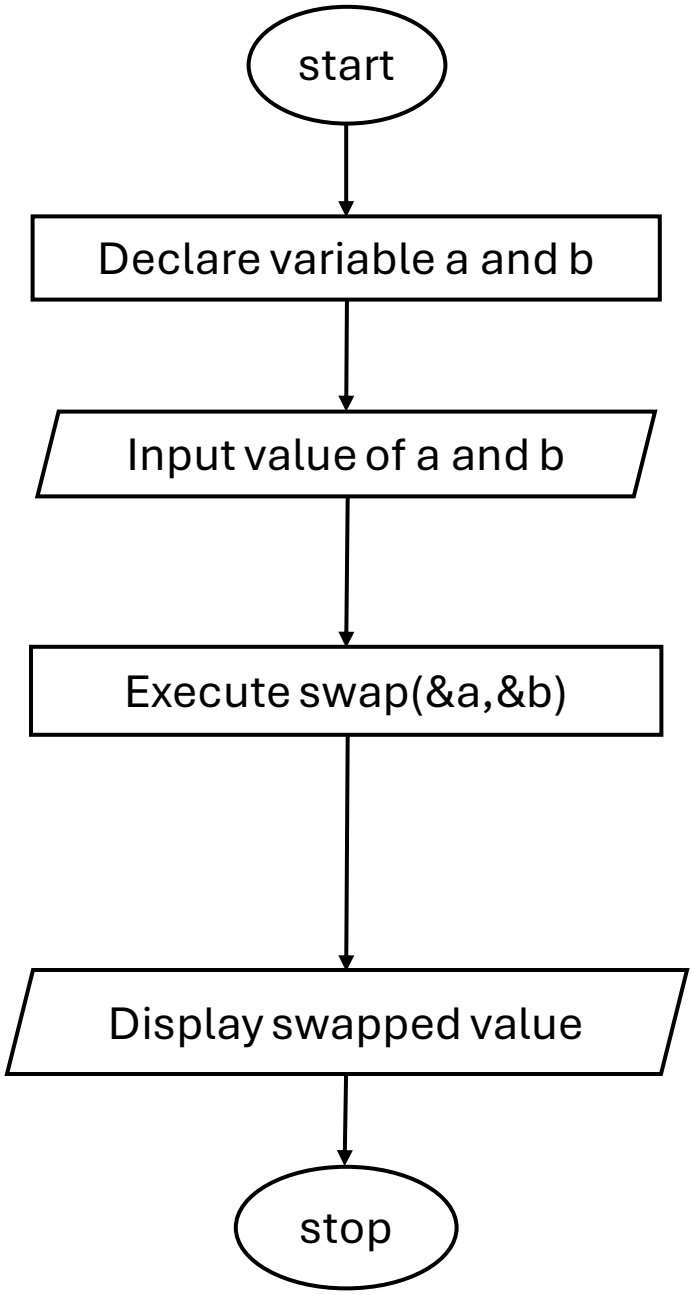
code:-

```c
#include <stdio.h>

void swap(int *x, int *y) {
    int temp = *x;
    *x = *y;
    *y = temp;
}

int main() {
    int a, b;
    printf("enter value of a and b: ");
    scanf("%d%d",&a,&b);
    printf("Before swapping: a = %d, b = %d\n", a, b);
    swap(&a, &b);
    printf("After swapping: a = %d, b = %d\n", a, b);
    return 0;
}
```

output:-

enter value of a and b: 5 6
Before swapping: a = 5, b = 6
After swapping: a = 6, b = 5

Flow chart:-

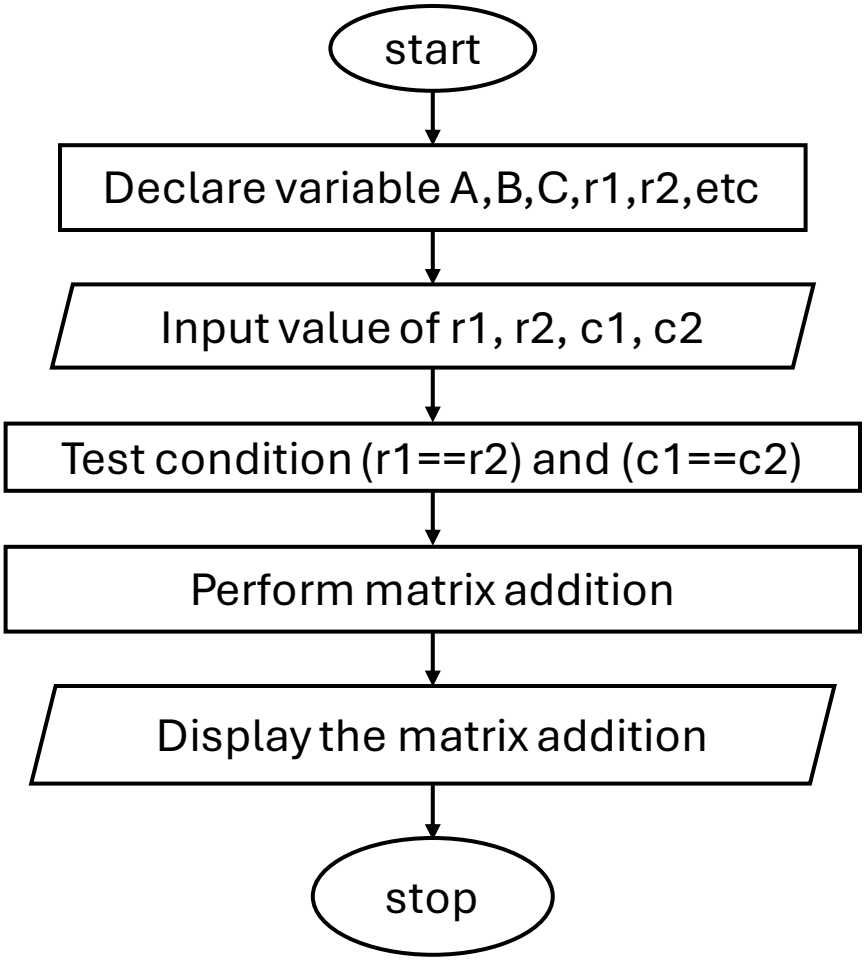

start
Declare variable a and b
Input value of a and b
Execute swap(&a,&b)
Display swapped value
stop

Q10: WAP to calculate addidtion of 2 matrices using 2d array.

Algorithm:-

Slep 1: start
Step 2: Declares variable, A, B, C, r, r2, c1, c2, I, j
Step 3: Input value of r1, r2, c1, c2
Step 4: Test condition (r1==r2) and (c1==c2)
Step 5: Perform matrix addition
Step 6: Display matrix addition
Step 7: stop

Flow chart:-



code:-

```c
#include<stdio.h>

int main(){
    int i,j,A[10][10],B[10][10],C[10][10],r1,r2,c1,c2;
    printf("enter row and column of matrix A: ");
    scanf("%d%d",&r1,&c1);
    printf("enter row and column of matrix B: ");
    scanf("%d%d",&r2,&c2);
    if ((r1==r2)&&(c1==c2))
    {
        for (i = 0; i < r1; i++){
        for (j = 0; j < c1; j++){
                scanf("%d",&A[i][j]);
            }}

        for (i = 0; i < r2; i++){
        for (j = 0; j < c2; j++){
                scanf("%d",&B[i][j]);
            }}

        printf("addition of A and B: \n");
        for (i = 0; i < r1; i++){
        for (j = 0; j < c1; j++){
                C[i][j] = A[i][j] + B[i][j];
                printf("%d\t",C[i][j]);
            }
            printf("\n");
        }
    }else{
        printf("array size mismatched.");
    }
return 0;
}
```

Q11: WAP to write in a file character by character

code:-

```c
#include<stdio.h>
#include<string.h>
#include<stdlib.h>

int main(){
    FILE *fp;
    char s[] = "i love nepal";
    fp = fopen("myfile.txt","w");
    if (fp==NULL){
        printf("file cannot be created and not opened.");
        exit(1);
    }
    for (int i = 0; i < strlen(s); i++)
    {
        fputc(s[i],fp);
    }
    fclose(fp);
return 0;
}
```

output:-

New file is created: myfile.txt with “I love Nepal” inside

Q12: WAP to read data from myfile.txt

code:-

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

int main(){
    FILE *fp;
    char ch;
    fp = fopen("myfile.txt","r");
    if (fp==NULL){
        printf("file not found.");
        exit(1);
    }
    ch=getc(fp);
    while (!feof(fp))
    {
        printf("%c",ch);
        ch=fgetc(fp);
    }
    fclose(fp);
return 0;
}
```

output:-

I love nepal