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Sem: 1st

Assignment-1

Q1: Draw a flowchart and write a program to find a number is number is strong number or not using function.

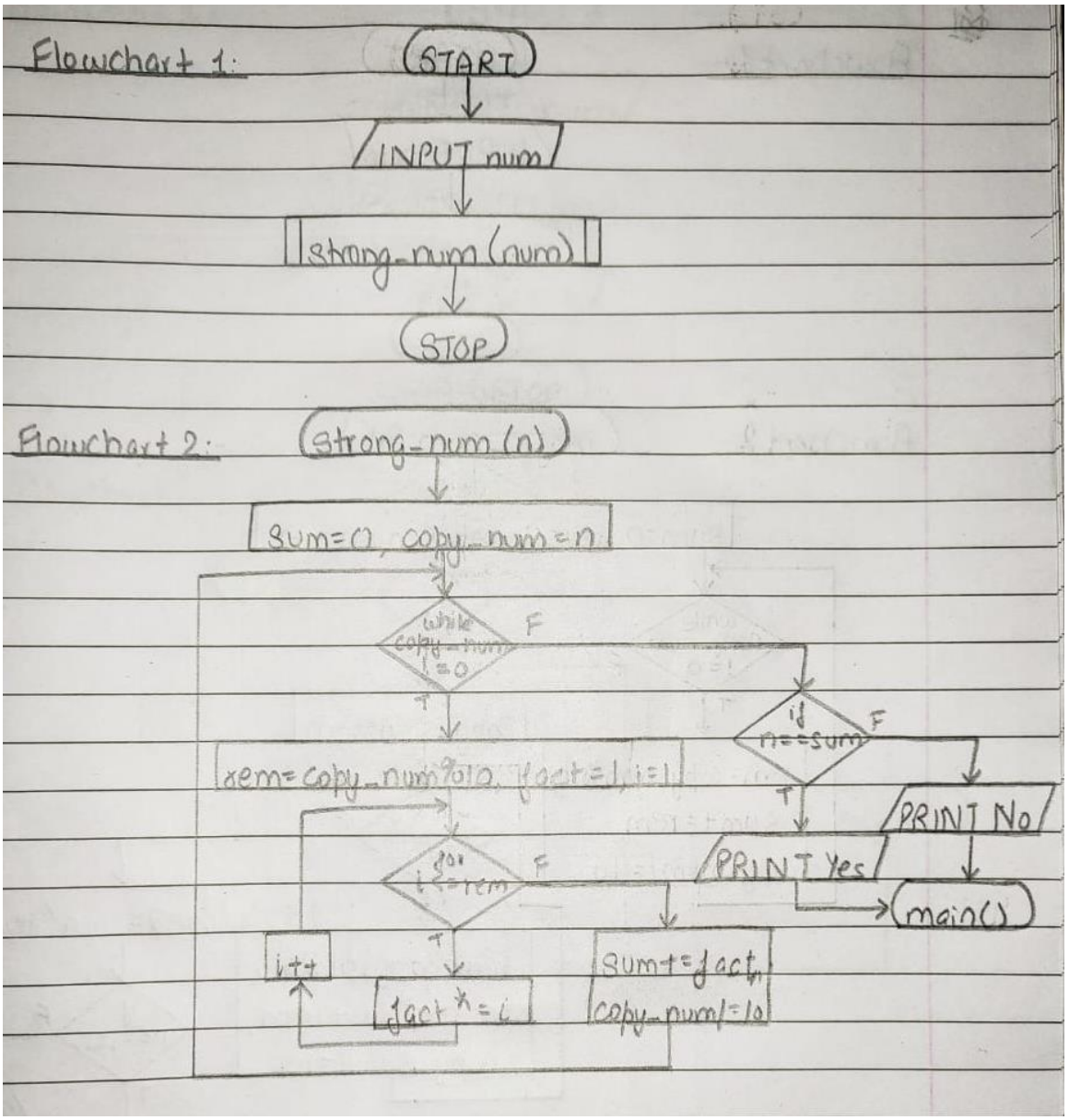
SOURCE CODE

```c
#include<stdio.h>
void strong_num(int n);
int main() {
  printf("------------DETAILS------------\n");
  printf("Name: Deepanshu Gupta\nRoll No.: 51\n");
  printf("------------OUTPUT-------------\n");
  int num;
  printf("Enter a number: ");
  scanf("%d", &num);
  strong_num(num);
  return 0;
}
void strong_num(int n) {
  int copy_num, rem, i, sum=0;
  copy_num=n;
  while (copy_num!=0) {
    rem=copy_num%10;
    int fact=1;
    for (i=1; i<=rem; i++)
      fact*=i;
    sum+=fact;
    copy_num/=10;
  }
  if (n==sum)
    printf("Yes, %d is a strong number having result is %d\n", n, sum);
  else
    printf("No, %d is not a strong number having result is %d\n", n, sum);
}
```

OUTPUT

```
> ./a.out
------------DETAILS------------
Name: Deepanshu Gupta
Roll No.: 51
------------OUTPUT-------------
Enter a number: 145
Yes, 145 is a strong number having result is 145
>
```

FLOWCHART



Q2: Draw a flowchart and write a program to find whether a number is magic number or not using function.

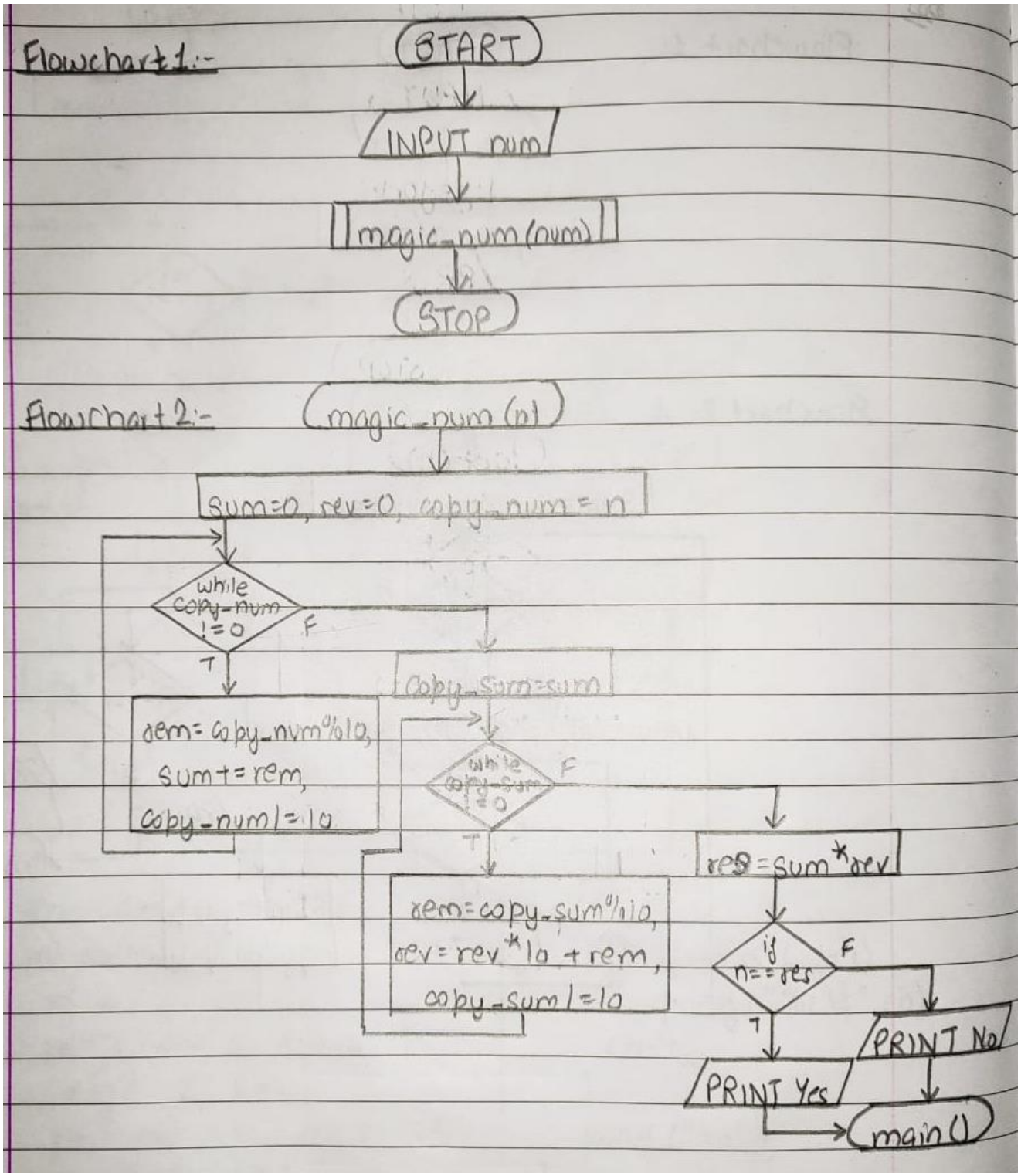
SOURCE CODE

```c
#include<stdio.h>
void magic_num(int n);
int main() {
  printf("------------DETAILS------------\n");
  printf("Name: Deepanshu Gupta\nRoll No.: 51\n");
  printf("------------OUTPUT-------------\n");
  int num;
  printf("Enter a number: ");
  scanf("%d", &num);
  magic_num(num);
  return 0;
}
void magic_num(int n) {
  int copy_num, rem, i, sum=0, copy_sum, rev=0, res;
  copy_num=n;
  while (copy_num!=0)
    rem=copy_num%10, sum+=rem, copy_num/=10;
  copy_sum=sum;
  while (copy_sum!=0)
    rem=copy_sum%10, rev=rev*10+rem, copy_sum/=10;
  res=sum*rev;
  if (n==res)
    printf("Yes, %d is a magic number having result is %d\n", n, res);
  else
    printf("No, %d is not a magic number having result is %d\n", n, res);
}
```

OUTPUT

```
> ./a.out
------------DETAILS------------
Name: Deepanshu Gupta
Roll No.: 51
------------OUTPUT-------------
Enter a number: 1729
Yes, 1729 is a magic number having result is 1729
>
```

FLOWCHART


Flowchart 1:-
START
INPUT num
magic_num(num)
STOP
Flowchart 2:-
magic_num(n)
sum=0, rev=0, copy_num = n
while copy_num != 0
F
T
rem = copy_num%10,
sum += rem,
copy_num /= 10
copy_sum=sum
while copy_sum != 0
F
T
rem=copy_sum%10,
rev = rev * 10 + rem,
copy_sum /= 10
res = sum * rev
if n == res
F
T
PRINT No
PRINT Yes
main()

Q3: Draw a flow chart and write a program to calculate factorial value of an integer using function.

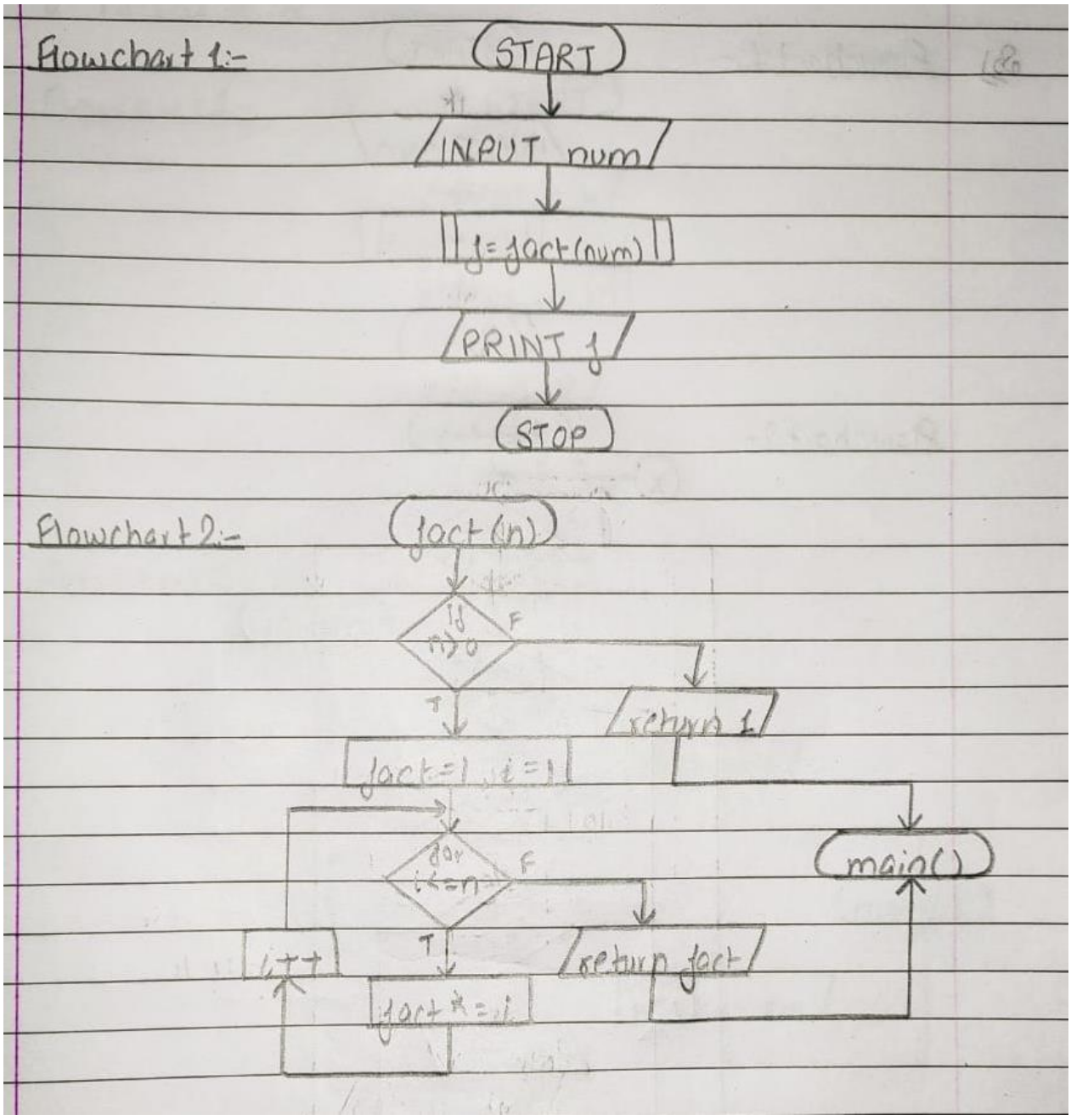
SOURCE CODE

```c
#include<stdio.h>
int fact(int n);
int main() {
  printf("------------DETAILS------------\n");
  printf("Name: Deepanshu Gupta\nRoll No.: 51\n");
  printf("------------OUTPUT-------------\n");
  int num;
  printf("Enter a number: ");
  scanf("%d", &num);
  printf("Factorial of %d = %d\n", num, fact(num));
  return 0;
}
int fact(int n) {
  if (n>0){
    int i, fact=1;
    for (i=1; i<=n; i++)
      fact*=i;
    return fact;
  }else
    return 1;
}
```

OUTPUT

```
> ./a.out
------------DETAILS------------
Name: Deepanshu Gupta
Roll No.: 51
------------OUTPUT-------------
Enter a number: 7
Factorial of 7 = 5040
>
```

FLOWCHART


Flowchart 1:-
START
INPUT num
f=fact(num)
PRINT f
STOP
Flowchart 2:-
fact(n)
If n>0
F
T
return 1
fact=1, i=1
for i<=n
F
T
i++
fact*=i
return fact
main()

Q4: A positive integer is entered through the keyboard. Write a function to obtain prime factors of this number.

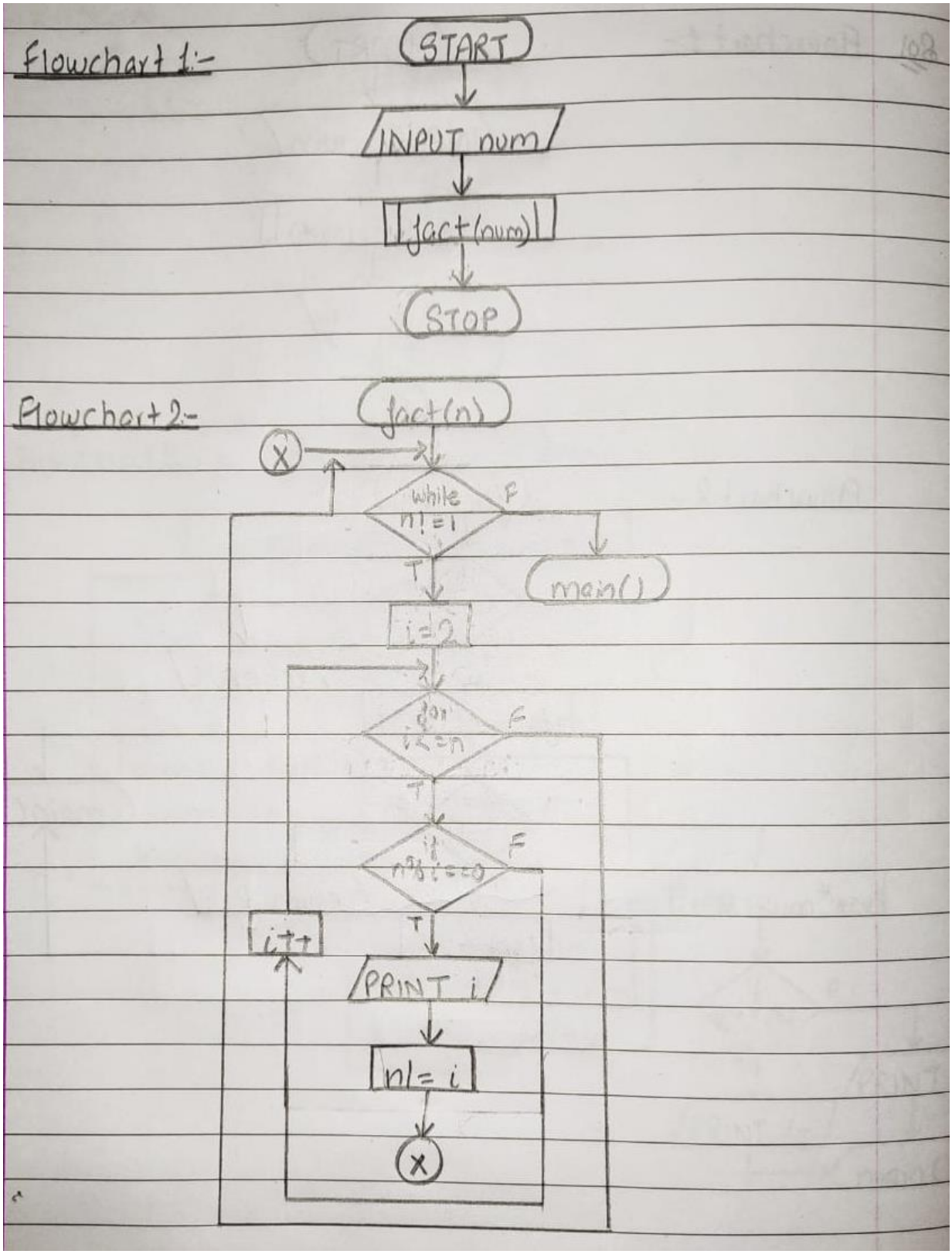
SOURCE CODE

```c
#include<stdio.h>
void fact(int n);
int main() {
  printf("------------DETAILS------------\n");
  printf("Name: Deepanshu Gupta\nRoll No.: 51\n");
  printf("------------OUTPUT-------------\n");
  int num;
  printf("Enter a number: ");
  scanf("%d", &num);
  printf("Factors of %d = ", num);
  fact(num);
  return 0;
}
void fact(int n) {
  int i;
  while (n!=1){
    for (i=2; i<=n; i++){
      if (n%i==0){
        printf("%d\t", i);
        n/=i;
        break;
      }
    }
  }
  printf("\n");
}
```

OUTPUT

```
> ./a.out
------------DETAILS------------
Name: Deepanshu Gupta
Roll No.: 51
------------OUTPUT-------------
Enter a number: 24
Factors of 24 = 2   2   2   3
>
```

FLOWCHART


Flowchart 1:-
START
INPUT num
fact(num)
STOP
Flowchart 2:-
fact(n)
X
while n!=1
F
T
main()
i=2
for i<=n
F
T
if n%i==0
F
T
i++
PRINT i
n!= i
X

Q5: Write a program using function and draw a flowchart to make a function power(a,b) to calculate the value of a raised to b.

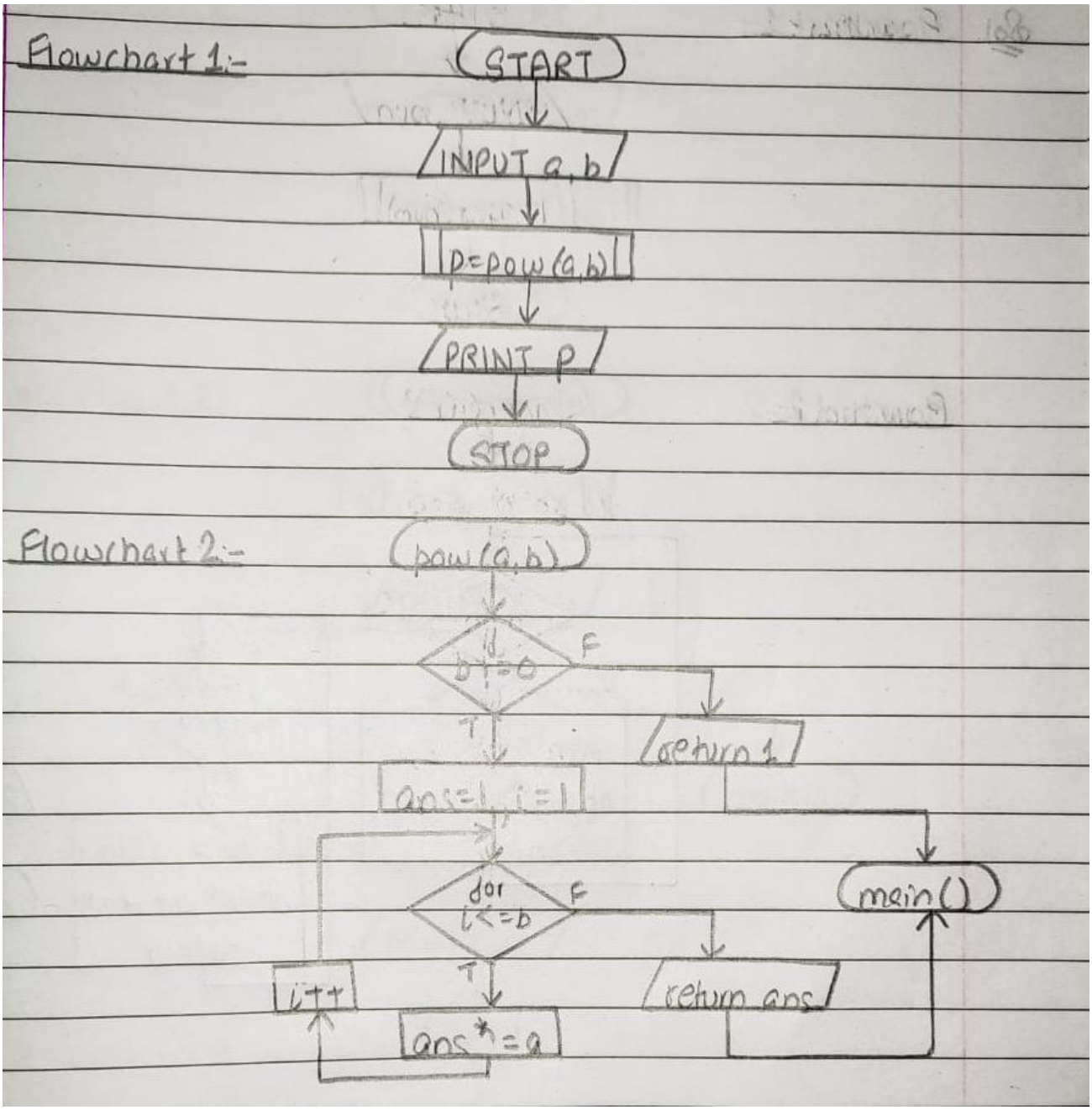
SOURCE CODE

```c
#include<stdio.h>
int pow(int a, int b);
int main() {
  printf("------------DETAILS------------\n");
  printf("Name: Deepanshu Gupta\nRoll No.: 51\n");
  printf("------------OUTPUT-------------\n");
  int a, b;
  printf("Enter a number and power:\n");
  scanf("%d %d", &a, &b);
  printf("The value of %d raised to power %d = %d\n", a, b, pow(a,b));
  return 0;
}
int pow(a, b) {
  int i, ans=1;
  if (b!=0){
    for (i=1; i<=b; i++)
      ans*=a;
    return ans;
  }
  else return 1;
}
```

OUTPUT

```
> ./a.out
------------DETAILS------------
Name: Deepanshu Gupta
Roll No.: 51
------------OUTPUT-------------
Enter a number and power:
9
3
The value of 9 raised to power 3 = 729
>
```

FLOWCHART


Flowchart 1:-
START
INPUT a, b
p=pow(a,b)
PRINT p
STOP
Flowchart 2:-
pow(a,b)
b!=0
F
T
return 1
ans=1, i=1
for i<=b
F
T
return ans
main()
i++
ans*=a

Q6: Write a program using the function to convert decimal numbers to binary numbers.

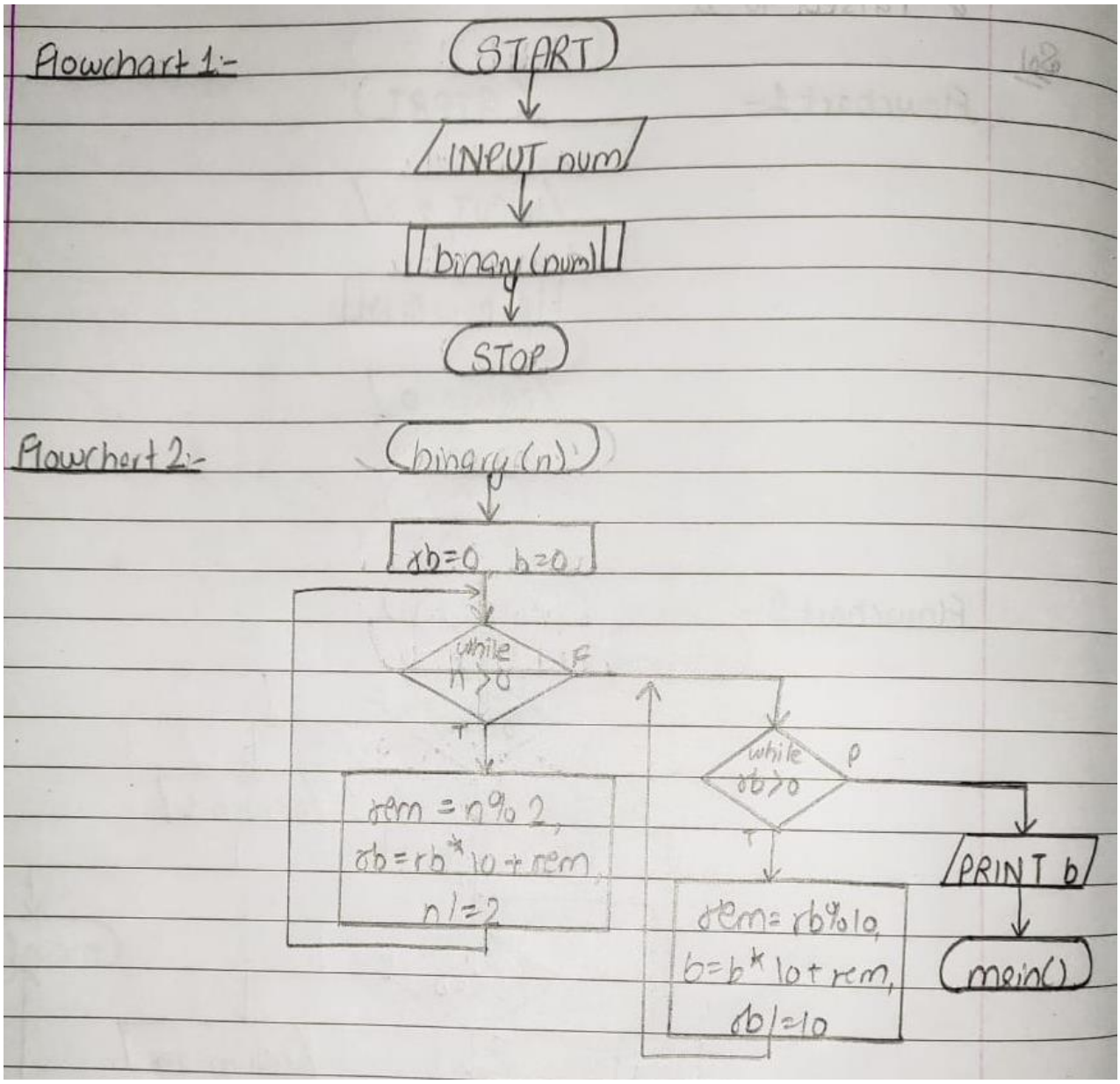
SOURCE CODE

```c
#include<stdio.h>
void binary(int n);
int main() {
  printf("------------DETAILS------------\n");
  printf("Name: Deepanshu Gupta\nRoll No.: 51\n");
  printf("------------OUTPUT-------------\n");
  int num;
  printf("Enter decimal number: ");
  scanf("%d", &num);
  binary(num);
  return 0;
}
void binary(n) {
  int rem, rb=0, b=0;
  while (n>0)
    rem=n%2, rb=rb*10+rem, n/=2;
  while (rb>0)
    rem=rb%10, b=b*10+rem, rb/=10;
  printf("Binary Number = %d\n", b);
}
```

OUTPUT

```
> ./a.out
------------DETAILS------------
Name: Deepanshu Gupta
Roll No.: 51
------------OUTPUT-------------
Enter decimal number: 123
Binary Number = 1111011
>
```

FLOWCHART


Flowchart 1:-
START
INPUT num
binary(num)
STOP
Flowchart 2:-
binary(n)
rb=0 b=0
while n>0
F
T
rem = n%2,
rb=rb*10+rem,
n/=2
while rb>0
F
T
rem=rb%10,
b=b*10+rem,
rb/=10
PRINT b
main()

Q7: Write a program using C to print Fibonacci series.

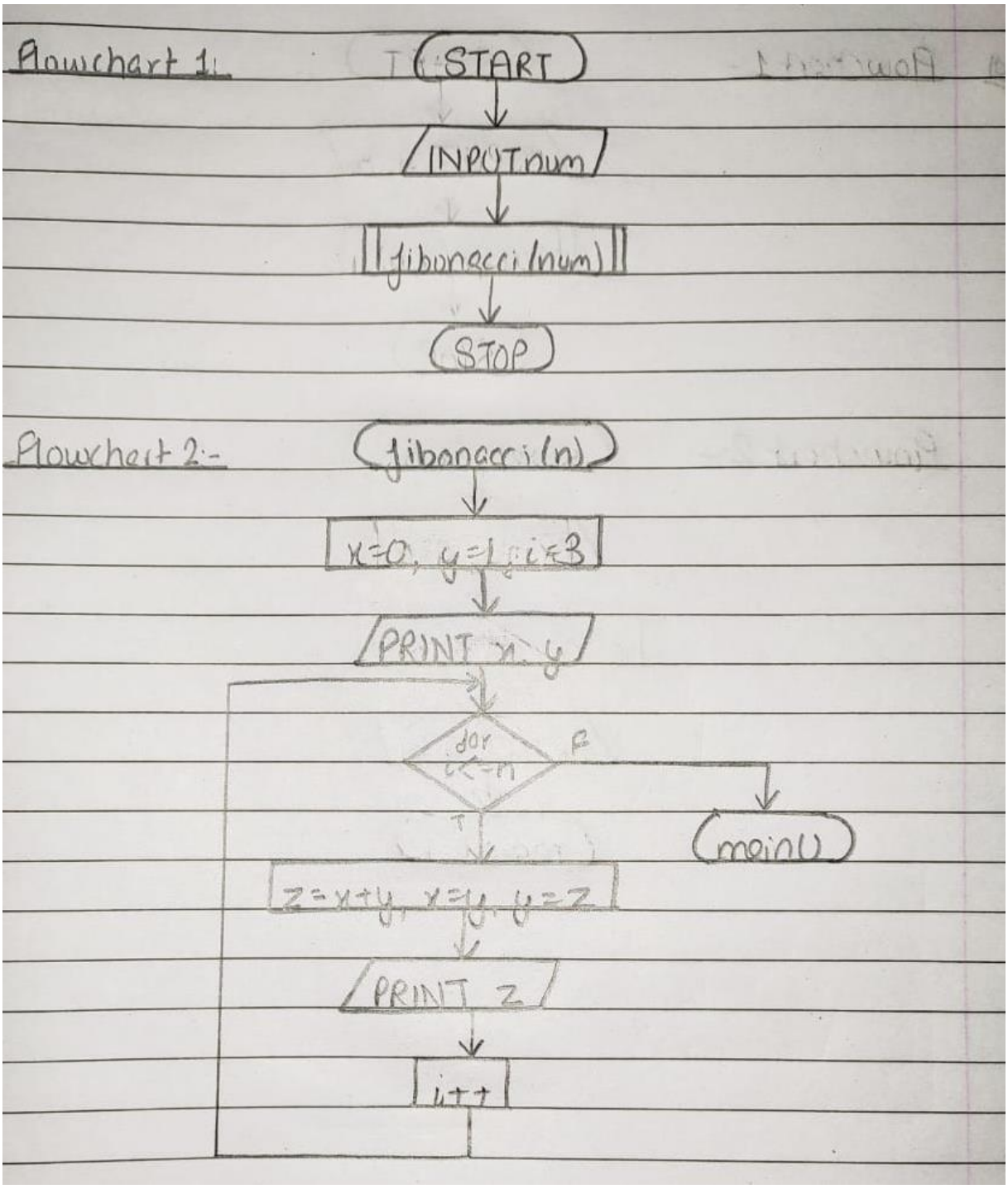
SOURCE CODE

```c
#include<stdio.h>
void fibonacci(int n);
int main() {
  printf("------------DETAILS------------\n");
  printf("Name: Deepanshu Gupta\nRoll No.: 51\n");
  printf("------------OUTPUT-------------\n");
  int num;
  printf("Enter a number: ");
  scanf("%d", &num);
  fibonacci(num);
  return 0;
}
void fibonacci(int n) {
  int x=0, y=1, z, i;
  printf("%d\t%d\t", x, y);
  for (i=3; i<=n; i++) {
    z=x+y;
    printf("%d\t", z);
    x=y, y=z;
  }
  printf("\n");
}
```

OUTPUT

```
> ./a.out
------------DETAILS------------
Name: Deepanshu Gupta
Roll No.: 51
------------OUTPUT-------------
Enter a number: 10
0   1   1   2   3   5   8   13  21  34
>
```

FLOWCHART


Flowchart 1:
START
INPUT num
fibonacci(num)
STOP
Flowchart 2:-
fibonacci(n)
x=0, y=1, i=3
PRINT x, y
i<=n
F
T
main()
z=x+y, x=y, y=z
PRINT z
i++

Q8: Write a program using the function to swap 2 numbers.

SOURCE CODE

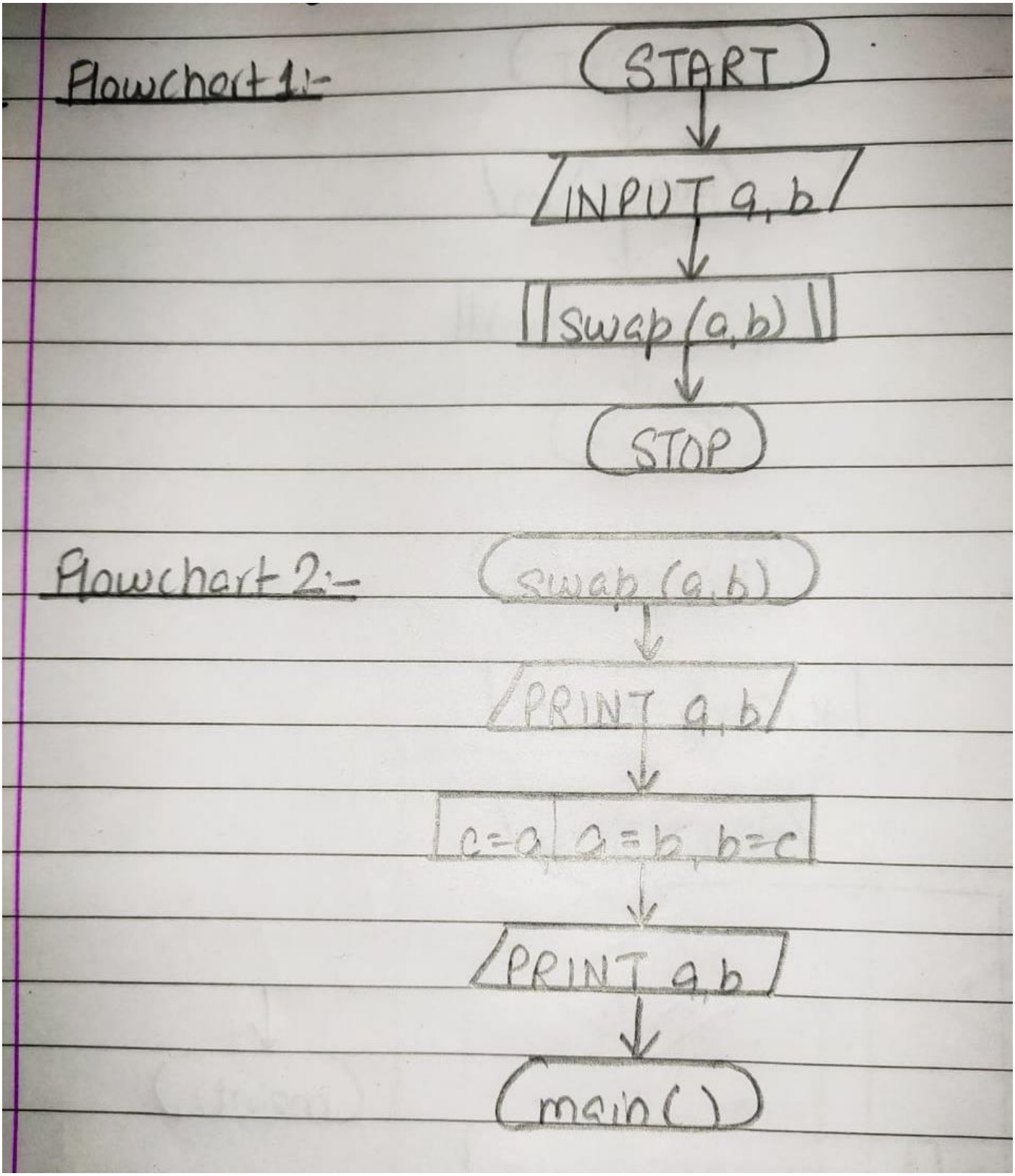
```c
#include<stdio.h>
void swap(int a, int b);
int main() {
  printf("------------DETAILS------------\n");
  printf("Name: Deepanshu Gupta\nRoll No.: 51\n");
  printf("------------OUTPUT-------------\n");
  int a, b;
  printf("Enter a number and power:\n");
  scanf("%d %d", &a, &b);
  swap(a,b);
  return 0;
}
void swap(a, b) {
  int c;
  printf("Before Swapping,\nA = %d and B = %d\n", a, b);
  c=a, a=b, b=c;
  printf("After Swapping,\nA = %d and B = %d\n", a, b);
}
```

OUTPUT

```
> ./a.out
------------DETAILS------------
Name: Deepanshu Gupta
Roll No.: 51
------------OUTPUT-------------
Enter a number and power:
25
50
Before Swapping,
A = 25 and B = 50
After Swapping,
A = 50 and B = 25
>
```

FLOWCHART

Flowchart 1:-



Flowchart 2:-