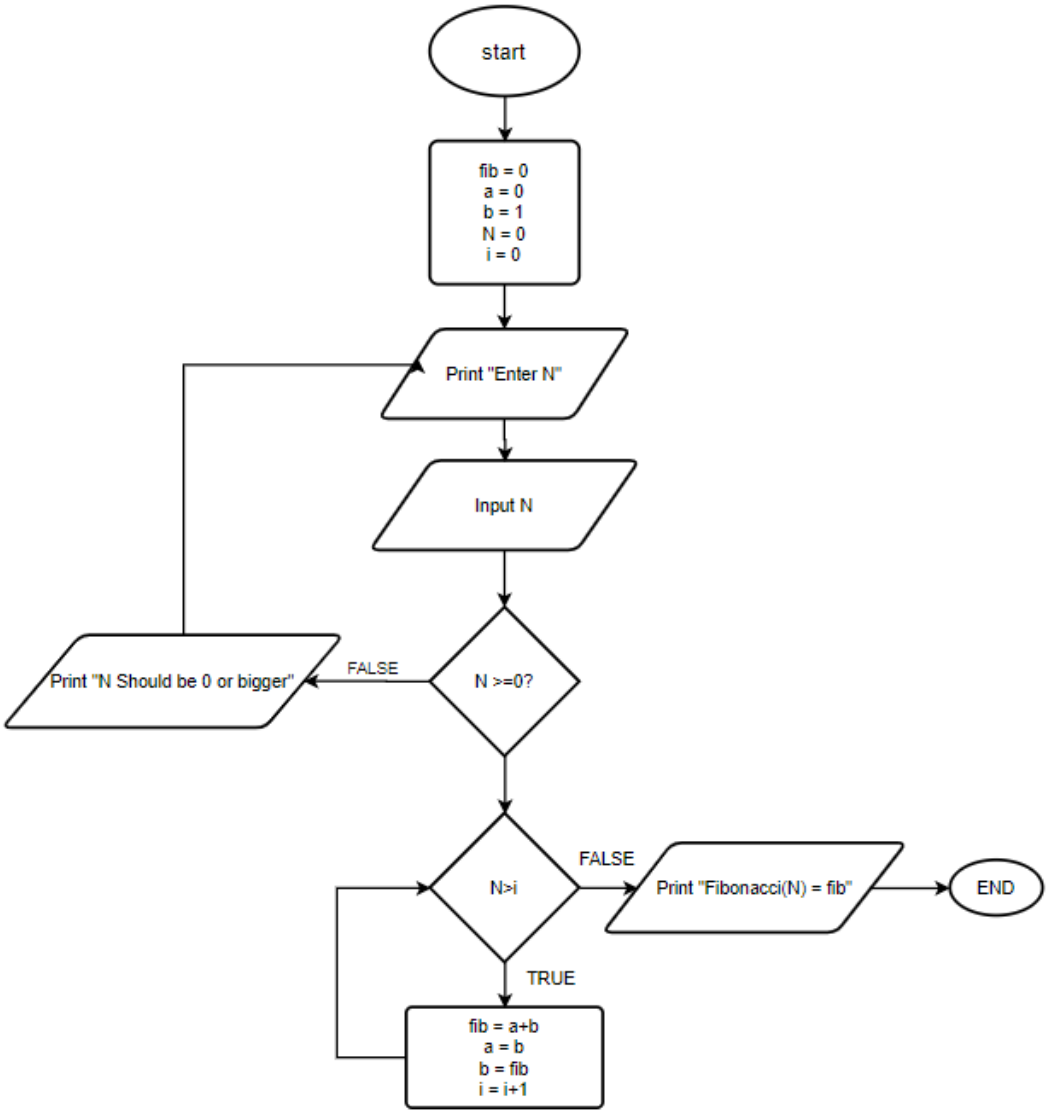
1. Calculate the n-th value of Fibonacci sequence, knowing that f0 = 0, f1 = 1, fn = fn-1 + fn-2

Flow chart:



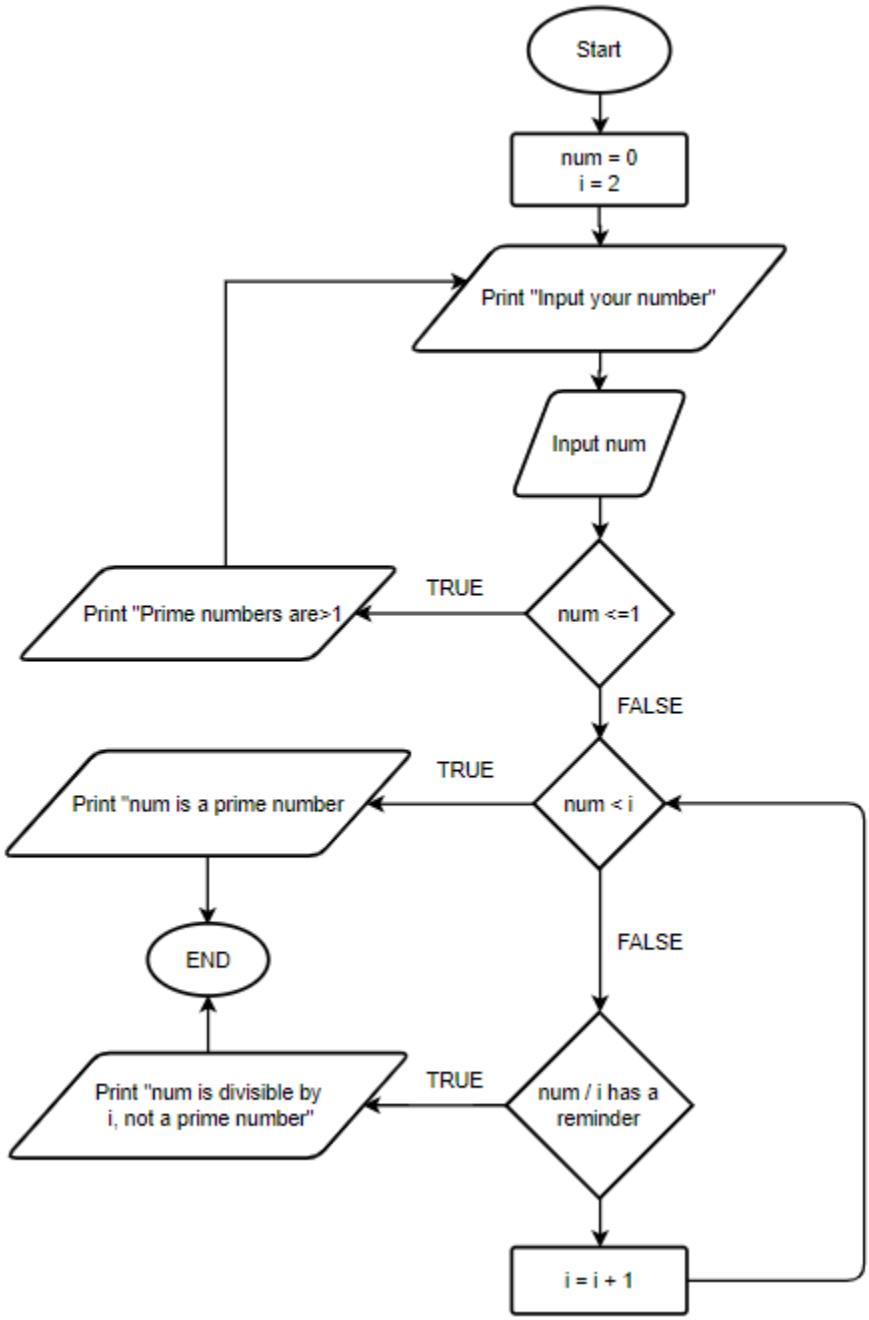
Code (Java):

```
//Scanner is imported at the beginning of the file
public static void fibonacci(){
    Scanner sc = new Scanner(System.in);
    int fib=0;
    int a = 0;
    int b =1;
    int N = 0;
    int i = 0;
     System.out.print("Enter N: ");
    N = sc.nextInt();

    while(N<0){
       System.out.print("N Should be 0 or bigger");
       System.out.print("\nEnter N: ");
       N = sc.nextInt();
    }
    while(N>i){
       fib = a+b;
       a = b;
       b = fib;
       i = i+1;
    }
    System.out.println("Fibonacci("+N+") = "+ fib);
  }
```

2. Check if a given natural number is a prime number

Flow chart:



Code (Java):

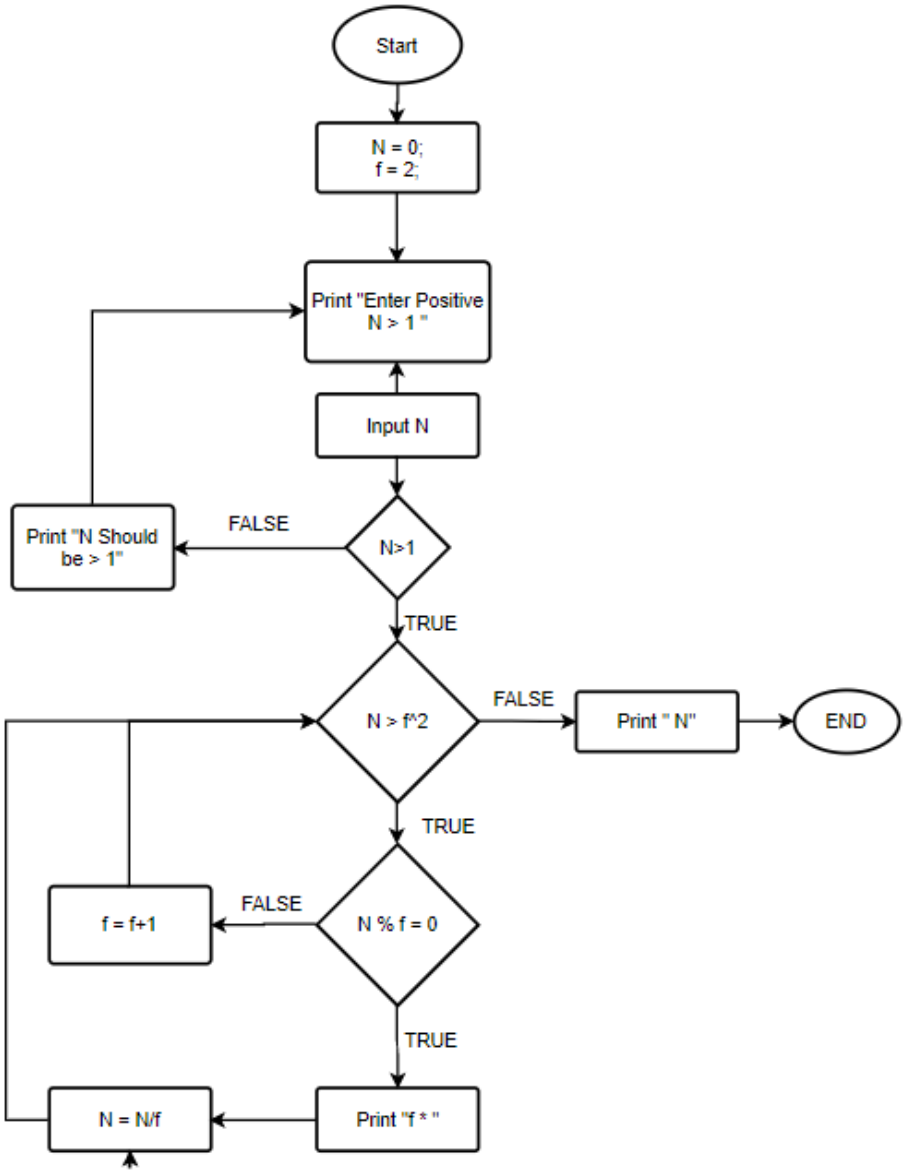
```
public static void isPrimeNumber(){
    int num = 0;
    int i = 2;
    Scanner sc = new Scanner(System.in);

    System.out.print("Input your number: ");
    num = sc.nextInt();

    while(num<=1){
       System.out.println("Prime numbers are > 1");
       System.out.print("Input your number: ");
       num = sc.nextInt();
    }
    while(num>i){
       if(num%i>0){
          i = i+1;
       }
       else{
          System.out.println(num +" is divisible by "+i+", not a prime number");
          return;
       }
    }
    if(num==i) System.out.println(num + " is a prime number");
  }
```

3 . Write a given natural number as a product of prime numbers, e.g. 16 -> 2 * 2 * 2 * 2, 21 -> 3 * 7

FlowChart:



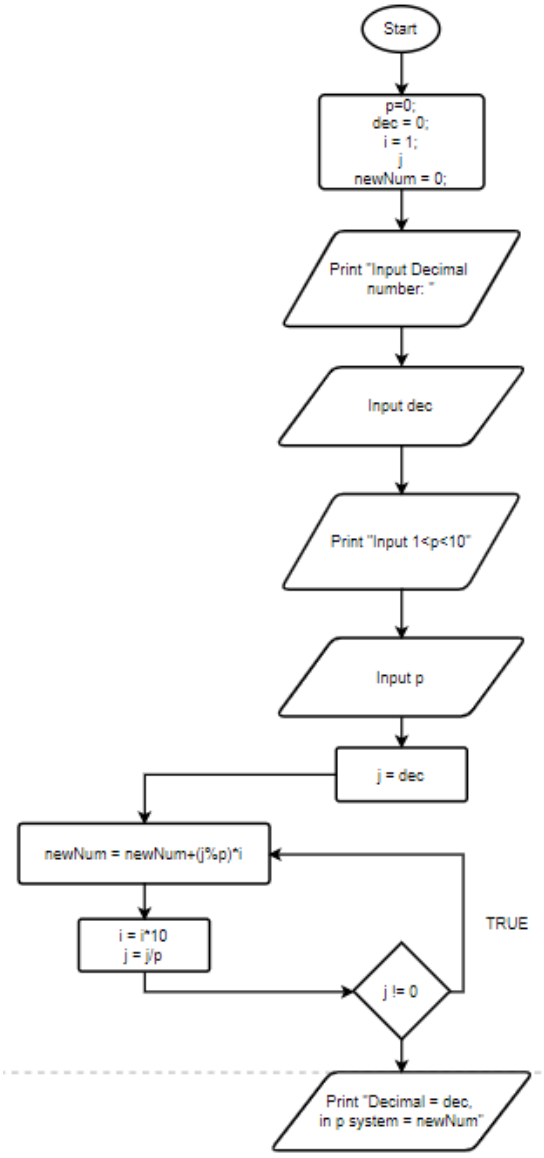
Code:

```
public static void primeFactors(){
        int N = 0;
        int f = 2;
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter N >1: ");
        N = sc.nextInt();
        while(N<=1){
           System.out.println("N should be >1! ");
           System.out.print("Enter N >1: ");
           N = sc.nextInt();
        }
        System.out.print(N + "=");

        do{
           if(N%f ==0){
              System.out.print(f+"*");
              N = N/f; //divide by prime;
           }
           else{
              f = f+1;
           }
        }while(N>=f*f);
        System.out.print(N);
    }
```

4. Convert a natural number written in decimal system in the p system (1 < p < 10).

Flowchart:



Code:

```
public static void decimalToP(){
      int dec = 0;
      int p = 0;
      int i = 1;
      int j;
      int newNum = 0;
      Scanner sc = new Scanner(System.in);

      System.out.println("Input Decimal Number: ");
      dec = sc.nextInt();
      System.out.println("Input 1<p<10: ");
      p = sc.nextInt();

      j = dec; //temp var
      do{
         newNum = newNum+(j%p)*i;
         i *=10;
         j/=p;
      }
      while(j!=0);

      System.out.println("Decimal "+dec + " = "+ p +"'th "+ newNum);

   }
```