```java
import java.io.*;
import java.util.*;
import java.lang.Math.*;

/**
 * class ReadFile reads the input file and stores the values in an int array
 */
class ReadFile {

    private Scanner x;

    /*
     * openFile - checks and handles the exception of whether the file is found or
     * not.
     */
    public void openFile() {
        try {
            x = new Scanner(new File("testQ4.txt"));
        } catch (Exception e) {
            System.out.println("File not found");
        }
    }

    /*
     * readFile() funtion reads the value from file and returns the values as an
     * array of integers
     */
    public int[] readFile() {
        int[] n = new int[4];
        int i = 0;
        while (x.hasNext()) {
            n[i] = x.nextInt();
            i++;
        }
        return n;
    }

    public void closeFile() {
        x.close();
```

```
40      }
41  }
42
43  public class Question4 {
44      /*
45       * @param number - current value, x - current digit, k - number of
    digits
46       */
47      private void printNumber(int number, int x, int k) {
48          if (k == 0) {
49              System.out.print(number + " ");
50              return;
51          }
52          // Try all possible greater digits
53          for (int i = (x + 1); i < 10; i++)
54              printNumber(number * 10 + i, i, k - 1);
55      }
56
57      /*
58       * @param k - length of ordered numbers
59       */
60      private void generateNum(int k) {
61          printNumber(0, 0, k);
62      }
63
64      /*
65       * @param k is the size of the string
66       */
67      private void binary(int k) {
68          String a;
69          /*
70           * loops to form possible number of combinations of size k string
71           */
72          for (int i = 0; i < Math.pow(2, k); i++) {
73              a = "";
74              /*
75               * temp holds the alternate position of the characters in
    string
76               */
77              int temp = i;
78              /*
79               * loops to add the number of characters in a string
```

```
80              */
81              for (int j = 0; j < k; j++) {
82                  if (temp % 2 == 1)
83                      a = '1' + a;
84                  else
85                      a = '0' + a;
86                  temp = temp / 2;
87              }
88              if (!a.contains("11")) {
89                  System.out.print(a + " ");
90              }
91          }
92      }
93
94      public static void main(String[] args) {
95          ReadFile read = new ReadFile();
96          Question4 q = new Question4();
97          read.openFile();
98          int[] n = read.readFile();
99          for (int i = 0; i < n.length; i++) {
100             if (n[i] == 1) {
101                 System.out.println("n = " + n[i]);
102                 System.out.print(0 + " ");
103                 q.generateNum(n[i]);
104                 System.out.println();
105             }
106             if (n[i] == 2) {
107                 System.out.println("n = " + n[i]);
108                 for (int j = 1; j < 10; j++) {
109                     System.out.print("0" + j + " ");
110                 }
111                 q.generateNum(n[i]);
112                 System.out.println();
113             }
114             if (n[i] == 3) {
115                 System.out.println("k = " + n[i]);
116                 q.binary(n[i]);
117                 System.out.println();
118             }
119             if (n[i] == 4) {
120                 System.out.println("k = " + n[i]);
121                 q.binary(n[i]);
```

```
122                 System.out.println();
123             }
124         }
125         System.out.println();
126         read.closeFile();
127     }
128 }
```