You are to write a program in Java that takes another Java program in as data and produces a cross-reference index (CRI) for the program. This CRI is a list of every identifier in the program in alphabetical order. For each identifier, the CRI gives a list of all the line numbers of the program on which that identifier appears.

Your program’s output will include printing out the original program with line numbers, followed by the CRI.

Notes:

1. You can assume that the program you are reading in is syntactically correct.

2. All lines of the code are to be numbered, including blank lines.

3. The CRI should not include any keywords of the Java language, but should include things such as class, library, and method names.

4. Multiple references to a particular identifier on the same line should result in multiple occurrences of that line number in the list (e.g. look at identifier \texttt{b} in the example below).

5. Make sure the program is output with indentations (though they might not be exactly the same indentations of the source code).

6. Be sure the resulting output of the CRI is neatly formatted with each identifier starting a new line, a colon, and tabbed to a specific column for the start of the line number list. On the same line begin the list of line numbers with each number separated from the others by a comma and space.
Example Output

```java
import java.util.*;
public class Binary {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int num;
        System.out.print("Enter an integer: ");
        num = input.nextInt();
        String binaryNum = toBinary(num);
        System.out.println(binaryNum);
    }
}
```

// toBinary takes in a decimal integer and returns the binary equivalent
public static String toBinary(int n) {
    int digit;
    String b = "";
    while (n > 0) {
        digit = n % 2;
        b = digit + b;
        n /= 2;
    }
    return b;
}

Cross-Reference Index

args: 4
Binary: 2
b: 18, 22, 22, 25
binaryNum: 10, 11
digit: 17, 21, 22
in: 5
input: 5, 9
java: 1
main: 4
n: 16, 20, 21, 23
nextInt: 9
num: 6, 9, 10
out: 8, 11
print: 8
println: 11
Scanner: 5, 5
String: 4, 10, 16, 18
System: 5, 8, 11
toBinary: 10, 16
util: 1