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Problem #4: Well-connected

Suppose we have a set of places (at least 3 places) connected by cable lines. We are concerned with how well-connected this set of places is. We will call the collection of places connected if we can get from any place to any other place using the cable lines. We will say the collection is 1-connected if we can remove ANY line and still be able to get from any place to any other place. Finally, we will say the collection is 2-connected if we can remove ANY TWO lines and still be able to get from any place to any other place. You are to write a program which will determine if a set of places and lines is connected, 1-connected, and 2-connected. For convenience, we will number the places instead of naming them. The input for each example will start with a line which indicates how many places we have. Each of the other lines of input will have two numbers, say a and b, to indicate a cable line between a and b. (The line works in both directions.) The last line of input is a #. The output is five lines for each example. Follow the form shown in the sample data. Assume that there are no more than 10 places and 40 lines in any one example. The initial data line of the input will be an integer specifying how many examples are to be solved.

Sample Input:

```
2
3
1 2
2 3
#
3
1 2
1 3
3 2
#
```

Sample Output:

```
Example 1:
The places are connected.
The places are not 1-connected.
The places are not 2-connected.
```

```
Example 2:
The places are connected.
The places are 1-connected.
The places are not 2-connected.
```

Include a blank line after each example. The verbiage and punctuation should be exactly as indicated in the sample output.