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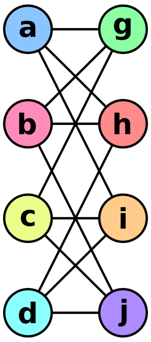
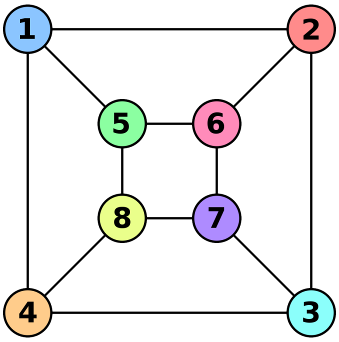
The Virtual Learning Environment for Computer Programming

Graph Isomorphism X34401_en

Write a program in Python that, using the **optilog** library, check if two graphs are isomorphic.





In order to use the optilog library, the program has to include something like:

```
from optilog.solvers.sat import *
...
solver = Glucose41()
solver.add_clauses(...)
solver.solve()
solver.model()
```

Input

The input is a text (in the stdin) with pairs of connected nodes representing two graphs, both separated by an empty line. Fo instance, the following text for the two graphs above:

```
a g
a h
a i
b g
b h
b j
c g
c i
c j
d h
d i
d j

1 2
1 4
1 5
2 3
```

```
2 6
3 4
3 7
4 8
5 6
5 8
6 7
7 8
```

Output

The output is also a text (in the stdout) with a list of pairs representing the isomorphism between the first graph and the second, if they are isomorphic. In this example:

```
a 3
b 1
c 6
d 8
g 2
h 4
i 7
j 5
```

If both graphs are not isomorphic, the missage must be one of the following:

```
Distinct number of nodes
Distinct number of edges
Not isomorphic
```

Sample input 1

```
a g
a h
a i
b g
b h
b j
c g
c i
c j
d h
d i
d j

1 2
1 4
1 5
2 3
2 6
3 4
3 7
4 8
5 6
5 8
6 7
7 1
```

Sample output 1

```
Not isomorphic
```

Sample input 2

```
a b
b c

1 2
2 3
3 4
```

Sample output 2

```
Distinct number of nodes
```

Sample input 3

```
a b
b c

1 2
2 3
1 3
```

Sample output 3

```
Distinct number of edges
```

Sample input 4

```
a b
a c
a d
a e
b c
b f
c d

1 4
2 3
3 4
3 5
4 5
4 6
5 6
```

Sample output 4

```
a 4
b 3
c 5
d 6
e 1
f 2
```

Scoring

Samples have been selected in order to ensure that there exist at most one mapping representing the solution. This mapping can be represented with any permutation.

Problem information

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