

Knights and Knaves

0= False, 1 = True

Statements:

Let A be the proposition, "Betty is a Knight"

Let B be the proposition, "Peggy is a Knight"

Let K be the conjunction $(A \rightarrow \neg B) \wedge (B \rightarrow A \wedge B)$

A	B	$A \rightarrow \neg B$	$B \rightarrow A \wedge B$	K	$(A \text{ xor } B) \wedge K$
0	0	1	1	1	0
0	1	1	0	0	0
1	0	1	1	1	1
1	1	0	0	0	0

If there can be multiple Knights and Knaves, there are 2 possible solutions. Betty and Piggy can both be Knaves, or Betty is a Knight and Peggy is a Knave.

If there must be one of each, as seen in the last column with $A \text{ xor } B$, then the only valid combination would be Betty is a Knight and Peggy is a Knave.