

Week 3 (28 Feb, 2005): Knights, Knaves and Propositional Connectives

Beweren en Bewijzen, Voorjaar 2005
Nijmeegs Instituut voor Informatica en Informatiekunde

February 18, 2005

Examinator: dr. Hanno Wupper

Docenten: drs. Ling Cheung, drs. Martijn Hendriks, dr. Stijn Hoppenbrouwers

On the Island of Knights and Knaves, there are two types of inhabitants:

- *knights*, who always make true statements;
- *knaves*, who always make false statements.

We know that every inhabitant (even a female one) is either a knight or a knave.

One day, a census taker visits the island to interview married couples. He asks each husband to reveal what type (knight or knave) he and his wife are, respectively. Below are some of the answers he collected.

Can you tell, for each case, what type the husband is and what type the wife is?

1 And

“We are both knaves!”

2 Or

“At least one of us is a knave.”

3 Implication

“If I am a knight, then so is my wife.”

4 Equivalence

“I am a knight if and only if my wife is a knight.”

Source:

Raymond Smullyan. “Forever undecided, a puzzle guide to Gödel”. Alfred A. Knopf, Inc., New York, 1987.