

Introduction to Mathematical Logic

SS 2010, Exercise Sheet #0

EXERCISE 1:

A centenarian was once asked for the secret to his long life.

“I strictly adhere to the following dietary rules: Whenever I don’t have beer with a meal, I’ll have fish. If I have both fish and beer at the same meal, I avoid ice cream. When I have ice cream or no beer, I won’t touch fish.”

The interviewer was pretty puzzled by this advice. Can you simplify it for her?

EXERCISE 2:

What is wrong with the following argument:

“If I run 100m in less than 10 seconds, this will get me admission to the olympic games. Unfortunately I need more than 10 seconds for 100m, hence no admission to the olympic games.”

EXERCISE 3:

Comment on the following statement of a local barber in Arheilgen:

“I shave every man in Arheilgen who does not shave himself.”

EXERCISE 4:

Comment on the following statement of Cretan philosopher Epimenides of Knossos (600 BC):

“All Cretans are liars!”

EXERCISE 5:

Comment on the following definition:

“Let n denote the least integer which cannot be defined using 80 latin letters.”

EXERCISE 6:

Comment on the following two definitions:

- a) Let X denote the set of all sets:

$$X := \{S \mid S \text{ set}\}$$

- b) Let Y denote the set of all sets which do *not* contain themselves:

$$Y := \{S \mid S \text{ set}, S \notin S\}$$