Mathematics 2200H – Mathematical Reasoning
TRENT UNIVERSITY, Fall 2021

Assignment #2
Due on Friday, 24 September.
May be submitted on paper or via Blackboard.[*]

A very special planet in the Unknown Regions is inhabited only by jedi and sith. Jedi always tell the truth and sith always lie. You meet eight inhabitants of this very special planet: Sol, Zek, Dab, Gy, Mer, Ey, Ab, and Rex.

Sol says that only a sith would say that Mer is a sith. Zek tells you, "Rex is a sith". Dab claims that Sol is a sith. Gy claims that Sol and Rex are not the same kind of Force-sensitive. Mer tells you that it's not the case that ~~Ae~~ Ab is a sith. Ey says, "At least one of the following is true: that Ab is a jedi or that I am a jedi." Ab says that Dab could claim that Mer is a sith. Rex tells you that Sol and Dab are not the same kind of Force-sensitive.

1. Determine, as best you can, which of the eight is a jedi and which is a sith. Please give your reasoning, as completely and clearly as you can. *[10]*

SOLUTION. When parsing the puzzle it is important to remember the condition that jedi always tell the truth and sith always lie. In particular, jedi cannot lie and sith cannot tell the truth. Here are the steps I took to solve this puzzle:

First, suppose that Sol is a sith. Since sith cannot tell the truth, Sol's statement that *only a sith would say that Mer is a sith* is a lie. This means that a jedi would say that Mer is a sith, which, since jedi only tell the truth, would mean that Mer was a sith as well. In turn, this would mean that Mer's statement that *it is not the case that Ab is a sith* is a lie, which would mean that Ab must be a sith. It follows that Ab lies when saying that *Dab could claim that Mer is a sith* , which, as Mer is a sith, can only be a lie if Dab were actually a sith. On the other hand, if Sol were a sith, Dab's claim that *Sol is a sith* is true, so Dab must be a jedi. Since no individual can be both a jedi and a sith – as no one can both always tell the truth and always lie – assuming that Sol is a sith leads to the contradictory conclusions that Dab is sith and that Dab is a a jedi. It is therefore impossible for Sol to be a sith, and so Sol must be a jedi.

Second, since Sol is a jedi, the statement that *only a sith would say that Mer is a sith* must be true. As sith can only lie, this means that Mer is not a sith, and therefore Mer is a jedi.

Third, since Mer is a jedi, Mer's statement that *it's not the case that Ab is a sith* is true, which means that Ab must be a jedi as well.

Fourth, since Sol is a jedi, Dab's claim that *Sol is a sith* is false, and thus Dab must be a sith.

Fifth, since Sol is a jedi and Dab is a sith, Rex's statement that *Sol and Dab are not the same kind of Force-sensitive* is true, and so Rex must be a jedi.

Sixth, since Sol and Rex are both jedi, Gy's claim that *Sol and Rex are not the same kind of Force-sensitive* is false, and so Gy must be a sith.

---

[*] All else failing, please email your solutions to the instructor at: `sbilaniuk@trentu.ca`

Seventh, since Rex is a jedi, Zek's statement that *Rex is a sith* is false, and thus Zek must be a sith.

Eighth and finally, since Ab is indeed a jedi, Ey's statement that *"At least one of the following is true: that Ab is a jedi or that I am a jedi"* is true, and thus Ey is also a jedi.

Hence Sol, Mer, Ab, Rex, and Ey must be jedi, while Dab, Gy, and Zek must be sith. Note that this solution is unique: once we have eliminated the possibility that Sol is a sith, the rest follows from the fact that Sol is a jedi. ■

NOTE. This puzzle is an adaptation of Puzzle #323 (out of 382) of the collection of "Knights and Knaves" puzzles posted by the Department of Philosophy at Hong Kong University at `https://philosophy.hku.hk/think/logic/knights.php` .