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## Problem of the Week

### Solution One

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**You meet three people, whose names are Asimov, Buffy and Columbo. Asimov says, “All of us are knaves.” Buffy then says, “Actually, exactly one of us is a knight.” Which of the three are knights and which are knaves?**

SOLUTION: The answer is that Asimov is a knave, Buffy is a knight, and Columbo is a knave.

To see that this is the case, start by considering Asimov’s statement. If he is a knight, then his assertion that all of them are knaves is clearly false. Since knights cannot make false statements, this is a contradiction. It follows that Asimov is a knave. It also follows that there is at least one knight among the three of them.

Now consider Buffy’s statement. Suppose that Buffy is a knave. Since we have already determined that there is at least one knight among the three, and since we already know that Asimov is a knave, it follows that Columbo would have to be a knight. But this would mean there really is exactly one knight among the three, which is exactly what Buffy said. So we now have a knave making a true statement, which is not possible.

It follows that Buffy is a knight. That means her statement that there is exactly one knight among them must be true. That implies that Columbo is a knave, and we are finished.