TRUTHTELLERS AND NORMALS

1 Introduction

Imagine that you are in a world where some people tell the truth ALWAYS and some people SOMETIMES tell the truth, and SOMETIMES lie. We call those that always tell the truth *Truthtellers* and those that sometimes lie and sometimes tell the truth *Normals*.

You will only be asking them YES-NO questions (these are called Boolean Questions.)

1. You are in a room with 3 people. 2 of them are truthtellers but 1 of them is a normal. They all know who each other are. By asking them questions, can you figure out who is a truthteller and who is a normal? How many questions will it take? (You may want to have someone else control the people in the room and make a game of it.)

2. Same question but now there is 1 truthteller, 2 normals.

3. Same question, but now there are 2 truthteller, 2 normals.

4. PROJECT: Try to work out, for t truthtellers and n normals when you CAN figure out who is who, and how many questions it takes.

5. VARIANT: What if you ask questions in parallel? That is, you can in one round as two questions, and try to minimize the number of rounds.

6. VARIANT: What if it is a case where you CANNOT establish who is who. Can you at least get the number of possibilites to be not so large?