Answers for the Logic Questions

1.

Solution:

1. Turn on switch 1 and leave it on for a few minutes.
2. After a few minutes, turn switch 1 off, and immediately turn switch 2 on.
3. Enter the room with the light bulbs.

Explanation:

- The bulb that is on corresponds to switch 2 (it's currently on)
- The bulb that is off but warm corresponds to switch 1 (it was on for a while, then turned off).
- The bulb that is off and cold corresponds to switch 3 (it was never turned on).

2.

- Array A (capacity 3)
- Array B (capacity 5)

Goal: Have exactly 4 elements in Array B using fill, empty, and transfer operations.

Steps:

1. Fill A (3)
2. Transfer A → B (B = 3, A = 0)
3. Fill A (3)
4. Transfer A → B (B = 5, A = 1 left in A)
5. Empty B (B = 0)
6. Transfer A → B (B = 1, A = 0)
7. Fill A (3)
8. Transfer A → B (B = 4)
9. Done.