Exercise 4: Hats and Snacks (Logical Thinking)

**Puzzle 1:** Four people are standing in a row, one behind the other, all facing the same way with person 1 at the front and person 4 at the end. Between numbers 1 and 2 is a wall that prevents any of the others from seeing person 1. So number 4 can see numbers 3 and 2, number 3 can see number 2, and numbers 2 and 1 cannot see anyone.

**Problem:** The people are told that two of them are wearing white hats and two are wearing black hats. They are told that if anyone of them can say what color hat they are wearing, they will all win fabulous prizes! They are not allowed to communicate with each other in any way. Will they be able to win the fabulous prizes? If so, why?

**Puzzle 2:** Remember the nasty dictator who liked to play games with his prisoners? He’s at it again! This time, he tells the prisoners that the next day they will be lined up so that person 1 sees nothing, person 2 sees person 1, person 3 sees people 1 and 2, etc. Each of them will have either a black or a white hat put on their head. Then the last person in line will be asked what color his own hat is. If he gets it right, he’s free. If he gets it wrong, he’s dead. Either way, the question is then posed to the second-to-last person in line. And so on.

**Problem:** How can the prisoners plan to answer the questions so as to maximize the number of lives saved?
**Puzzle 3:** During the lunch hour at school, a group of five boys from Miss Smith’s homeroom visited a nearby snackbar. One of the five boys took a candy bar without paying for it. When the boys were questioned by the school principal, they made the following statements:

- Rex: "Neither Earl nor I did it."
- Jack: "It was Rex or Abe."
- Abe: "Both Rex and Jack are lying."
- Dan: "Abe’s statement is not true."
- Earl: "What Dan said is wrong."

When Miss Smith was consulted, she said, "Three of these boys always tell the truth, and the other two always lie." Assuming that Miss Smith is correct, determine who took the candy bar.