## Penguins

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### Level 1:

Either Fred or Judy is a penguin but no more than one of them.

Either Judy or Alice is a penguin but no more than one of them.

***If we know there are two penguins, then what are their names?***

### Level 2:

Either Fred or Judy is a penguin but no more than one.

Either Judy or Alice is a penguin but no more than one.

Either Fred or Alice or Tom is a penguin but no more than one.

***If there are exactly two penguins, what are their names?***

### Level 3:

Either Fred or Judy is a penguin but no more than one.

Either Judy or Alice is a penguin but no more than one.

Exactly two of Fred, Alice, and Tom are penguins.

***If there are exactly two penguins, what are their names?***

## Penguins: Solutions

### Solution Level 1:

Must be Fred and Alice, because if Judy is a penguin, then neither Alice nor Fred can be.

### Solution Level 2:

Fred and Alice can't both be penguins by the third rule,

so Judy must be a penguin and Fred and Alice must not be.

Therefore Tom is another penguin.

### Solution Level 3:

It must be Fred and Alice.

It cannot be, say, Fred and Tom, because if so, then Judy is not a penguin and therefore neither Judy nor Alice is a penguin, which is impossible.

Similarly for Alice and Tom.