Inductions and Strength

There can be good arguments which nevertheless fail to be deductively valid. Consider this one:

In January 1997, it rained in San Diego.
In January 1998, it rained in San Diego.
In January 1999, it rained in San Diego.
:_: It rains every January in San Diego.

This is an inductive argument, because it generalizes from many cases to a conclusion about all cases. Certainly, the argument could be made stronger by adding additional premises:

In January 2000, it rained in San Diego. In January 2001: : : and so on.

Regardless of how many premises we add, however, the argument will still not be deductively valid. It is possible, although unlikely, that it will fail to rain next January in San Diego. Moreover, we know that the weather can be fickle. No amount of evidence should convince us that it rains there every January. Who is to say that some year will not be a freakish year in which there is no rain in January in San Diego; even a single counter-example is enough to make the conclusion of the argument false.

While deductions are evaluated in terms of "validity" and "invalidity", deductions are said to be "strong" or "weak." For example, the argument about rain in San Diego can be made more strong by including more premises with more information about the average rainfall in Seattle, and because of the reader's knowledge of the facts of the weather in Seattle. (In comparison, making such an argument about the Mojave Desert in California would be weaker.)

Cogency:

The truth of the premises is verified in a separate step: an inductive argument with all true premises is said to be cogent. If an inductive argument has one or more false premises, it is uncogent.