

The Drinker Paradox

Naproche formalization:

Marcel Schütz

2024

The *Drinker Paradox* is a principle of classical predicate logic popularised by the logician Raymond Smullyan in his 1978 book *What Is the Name of this Book?* [Smullyan1978] which can be stated as:

There is someone in the pub such that, if he is drinking then everyone in the pub is drinking.

Signature. The pub is an object.

Theorem (Drinker Paradox). Assume that there is a person inside the pub. Then there is a person P inside the pub such that if P is drinking then every person inside the pub is drinking.

Proof by case analysis. Case every person inside the pub is drinking. Choose a person P inside the pub. Then P is drinking and every person inside the pub is drinking. Hence if P is drinking then every person inside the pub is drinking. End.

Case there is a person inside the pub that is not drinking. Consider a person P inside the pub that is not drinking. Then if P is drinking then every person inside the pub is drinking. End. \square

Copyright

This work is licensed under a [Creative Commons](https://creativecommons.org/licenses/by-nc-sa/4.0/) “Attribution-NonCommercial-ShareAlike 4.0 International” license.

