Part of Homework 2 – MATH 2510 Spring 2018

Prolog exercise. Consider the Prolog code `logicops.pl` at https://github.com/tomcuchta/math2510spring2018/blob/master/logicops.pl. Copy this code to SWISH.

The fact `p(a)` is given in the code. To write the conjunction "$A \wedge B$" in Prolog, we write `A,B` – this is why `conj` is defined as it is in the code. The negation symbol $\neg$ is written as `\+`. Definition 1.6 in the text defines the disjunction $\vee$ as in $P \vee Q$ as $\neg(\neg P \wedge \neg Q)$. This justifies the defintion of `disj` in the code.

1. Run the query `p(a)`. What is the result?
2. Run the query `\+ p(a)`. What is the result?
3. Run the query `p(b)`. What is the result?
4. Run the query `\+ p(b)`. What is the result?
5. Define `impl` to encode the symbol $\rightarrow$ as in $P \rightarrow Q$ in terms of `disj`.
6. Define `iff` to encode the symbol $\leftrightarrow$ as in $P \longleftrightarrow Q$ in terms of `impl`.
7. Run `impl(p(a),p(b))`. What is the result?
8. Run `impl(\+ p(a),p(b))`. What is the result?
9. Run `iff(p(a),p(b))`. What is the result?
10. Run `iff(p(b),p(a))`. What is the result?