Solution to Problem 6

**Problem.** Show that the following function \( f(a, b) \) is \( \mu \)-recursive:

- \( f(a, b) = a + b \) when each of the two inputs \( a \) and \( b \) is either equal to 0 or equal to 1, and
- \( f(a, b) \) is undefined for other pairs \((a, b)\).

**Possible solution.** A natural idea is to take

\[
 f(a, b) = \mu m.((a = 0 \lor a = 1) \land (b = 0 \lor b = 1) \land (m = a + b)).
\]

**Another possible solution.**

\[
 f(a, b) = \mu m.((a = 0 \land b = 0 \land m = 0) \lor (a = 0 \land b = 1 \land m = 1) \lor
 (a = 1 \land b = 0 \land m = 1) \lor (a = 1 \land b = 1 \land m = 2)).
\]