Problem: Show the following statement: For every $L \in NP$ there is a LOGSPACE machine $M$ and a polynomial $p$ such that $M$ takes two inputs $x$ and $y$, ($|y| < p(|x|)$ and has the following connection with $L$:

For every $x \in \{0, 1\}^*$:

- If $x \in L$ then there exists a $y$ ($|y| < p(|x|)$) such that $M(x, y) = 1$;
- If $x \notin L$ then for every $y$ ($|y| < p(|x|)$ it holds $M(x, y) = 0$;

Notes: This problem is basically the same as 4.7 from the book. You can request a hint from the TA with no strings attached (except binary).