

Thus:

$N$  simulates using nondeterminism a queried string  $x \neq w$  on TM  $M$  in input.

Observe that if  $M$  accepts  $w$  it means that  $L(M) \neq \{w\}$  because  $x \in L(M)$  but  $x \notin \{w\}$ .

Hence  $N$  accepts iff  $enc(M) \in \bar{L}_P$

$\Rightarrow \bar{L}_P$  is in RE.

Now it is STRAIGHTFORWARD to prove that  $P$  is a TRIVIAL PROPERTY  $\Rightarrow$  By Rice's Theorem we can say that  $L_P$  is not in REC.

By a known-well theorem we can state that the only possibility is:

$\bar{L}_P$  is  $\sim$  RE/REC       $L_P$  is not RE