



Is there a TM that outputs itself?

Is there a TM  $M_r$  that on any  
input, outputs  $r$ ?

~~Yes.~~

# Construction

Define TM  $M_a$  as:

On input  $y$ , output  $s(y)$

where

$M_{s(y)}$  on any input outputs  $y$ .

Define TM  $M_b$  as:

On input  $p$ , compute  $s(p)$  and

Output  $ps(p)$ .  $\rightarrow$  Concatenation of TMs  
 $M_p$  &  $M_{s(p)}$ .

Let  $p = s(b)Q$  consider  $M_{s(b)s(s(b))}$ .