CPSC 354 Report

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1 The MU-Puzzle

MI $\rightarrow$ MU

Rule 1: If you possess a string whose last letter is `I`, add `U`.

Rule 2: Suppose you have `Mx`, you may add `Mxx`.

Rule 3: If `III` occurs in one of the strings, you may make a new string with `U` in place of `III`.

Rule 4: If `UU`, you can drop it.

MI
MII Mxx
MIIII Mxx
MIIIIIIII Mxx
MUIIU MIU
$\varnothing$

MI $\rightarrow$ use Mxx rule ∞ times
MIIII...

No matter what Rule you use you will never be able to get 0 Mod3, because I will always be 1 mod 3 or 2 mod 3

`MUUU`
`MIII`

Rule 1 does not affect # of I's.
Rule 2 does not give 0 mod 3.
Rule 3 does not solve the problem as removing 3 I's does not change the output of mod3.
Rule 4 does not change the # of I's.

We can never get rid of all of the I's, 0 mod 3 is not possible. Thus you cannot get MU from MI.