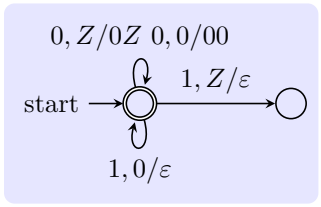
Homework 3

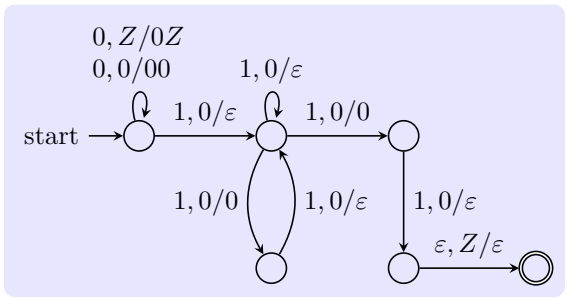
班号　　学号　　姓名

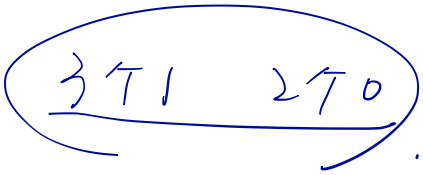
Design a PDA to accept each of the following languages. You may accept either by final state or by empty stack, whichever is more convenient.

1. The set of all strings of 0's and l's such that no prefix has more l's than 0's.



2. $L = \{0^n 1^m \mid 0 < n < m < 2n\}$





3. Use the CFL pumping lemma to show following language not to be context-free:
$\{a^i b^j c^k | i < j < k\}$.

反证法。假设 L=$\{a^i b^j c^k | i < j < k\}$ 是 CFL，由 CFL 泵引理，存在正整数 N，使长度超过 N 的串符合 CFL 泵引理。
取 $s = a^N b^{N+1} c^{N+2}$ 则 $s = uvwxy$ 中，因为 $|vwx| \leq N$ vwx 可能几种分布:

i) 都在 a 或 b 中，取 $i = 2$ 则 $s' = uv^i wx^i y$ 中 a 或 b 可能不小于 c
ii) 在 c 中，取 $i = 0$，$\cdots$
iii) 在 ab 之间，取 $i = 2$，$\cdots$
iv) 在 bc 之间，取 $i = 0$，$\cdots$

无论何种情况，都与假设矛盾。得证

4. Design a Turing machine for the language $L = \{w \mid w \in \{0,1\}^*, w = w^R\}$.

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