

TOC-Assignment # 2 (Topics: Pumping Lemma, M-N theorem.)

1. Use pumping lemma to show that following languages are not regular:
 - (a) $\{ww^R \mid w \in \{a+b\}^*\}$
 - (b) $\{w\bar{w} \mid w \in \{a+b\}^*\}$
 - (c) $\{a^{n!} \mid n \geq 1\}$
2. Prove that, if words in finite number are added into a regular language, the languages still remain regular
3. Make use of Myhill-Nerode theorem to prove that following language:
 - (a) $L^R = \{w^R \mid w \in L\}$ is regular,
 - (b) $L = \{a^i \mid i \text{ is perfect square}\}$ is not regular.
4. Find out the equivalence classes and index of following language: $L = \Sigma^*0\Sigma$.

*Note: (1) Submission deadline **Sept. 27, 2015** as softcopy online by email till 11:59PM, to kr.chowdhary@iitj.ac.in, with subject as TOC-Rollno. (2) The document should be in pdf form, preferably edited in latex or word and converted to pdf.*