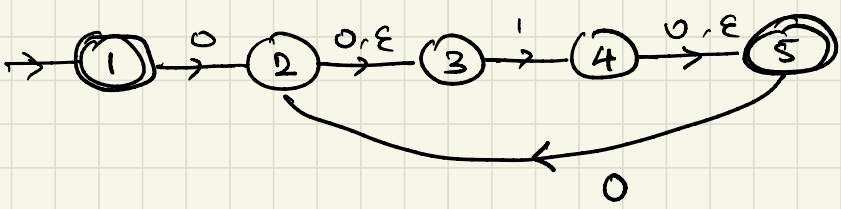
Revision: Week 2.

[Due by 5:00pm on 19th Aug]

Instructions

- Discussion is allowed and infact encouraged
- Answers **must** be written by yourself.
- All sources (including discussions) that are used to reach the solution must be mentioned.

(1) Construct a DFA corr. to the following NFA. Give only the portion of the DFA reachable from the start state.



[5]

(2) Describe the language corr. to the foll regular expression: $\Sigma^* a \Sigma^* b \Sigma^* a \Sigma^*$

Prove correctness.

[2 + 3]

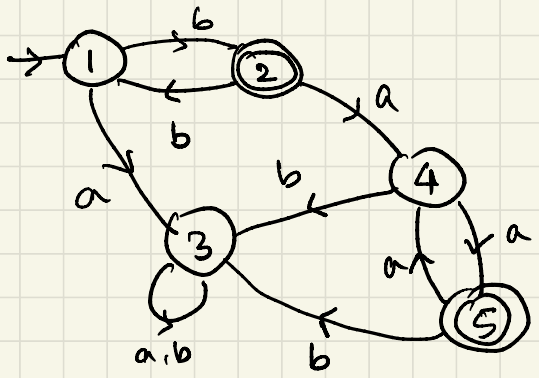
(3) Construct NFAs corr. to the foll. regular expressions.

i) ϕ^*

ii) $(((0\,0)^*\,(1\,1))\cup 01)^*$.

Proof of correctness not reqd. [2+4]

(4) What is the regular expression corr. to the following DFA?



[5]

(5) Use the pumping lemma to prove that $\{www : w \in \{0,1\}^*\}$ is not regular.

[4]