

Prob. 1	Prob. 2	Prob. 3

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Problem 1.

- a) Construct the DFA M_{diff} out of the DFAs M1 and M2 (symmetric difference)
- b) Construct the DFA M_{union} out of the DFAs M1 and M2 (union)
- c) Check if they are equal (as seen in lecture 5)
- d) Reject if they are, otherwise accept.

Problem 2.

Let us assume that R is recognizable. Then we could build a Turing machine for A_TM in the following way :

- 1) For a word w , run $0w$ and $1w$ through R
- 2) If $0w$ is accepted, w is in A_TM
- 3) If $1w$ is accepted, w is not in A_TM
- 4) If $0w$ is rejected, w is in A_TM
- 5) If $1w$ is rejected, w is in A_TM
- 6) $0w$ and $1w$ cannot both cause halting, because either w is in A_TM (

Problem 3.

Let C be x,y where x is anything, y is empty, and the separator is encoded as the empty string. Then all x in R have an y such that x,y is in C .