

# CS 311: Computational Structures

## Exercise 2

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Fix  $\Sigma = \{a, b\}$

1. Build an NFA  $M$  accepting  $\Sigma^*$ .
2. Build an NFA  $N$  accepting  $\epsilon$ .
3. Build an NFA  $O$  accepting  $\emptyset$ .
4. Apply the concatenation construction to build the concatenation of  $M$  and  $N$ . What language does this machine accept? (No proof or detailed calculation is expected. You are invited to inspect the machine and write down your conclusion.)
5. Apply the concatenation construction to build the concatenation of  $M$  and  $O$ . What language does the resulting machine accept?