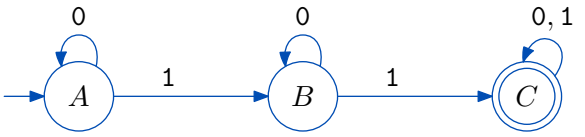
CpSc 3500 — Goddard — Fall24

Assignment 1

(Please work in groups of two or three and submit one answer sheet for the group.)

1. Give an FA which accepts only the string `0110`.

2. For the following FA, determine which of the strings `0110`, `1`, `1011010` and `00000` are accepted.



3. Give an FA for each of the following languages:

   (a) All binary strings with at least three `1`'s

   (b) All binary strings with an odd number of `1`'s

   (c) All binary strings without `111` as a substring

   (d) All binary strings where every *odd* position is a `1`

4. Give an FA whose language is the set of strings of `a`'s, `b`'s and `c`'s which contain `abc` as a substring.

5. For each RE, state which of the following strings is in the language of the RE: ε, `abba`, `bababb` and `baaaa`.

   (a) $(\mathtt{a}+\mathtt{b})^*\mathtt{ab}(\mathtt{a}+\mathtt{b})^*$

   (b) $\mathtt{b}^*\mathtt{ab}^*\mathtt{ab}^*$

   (c) $\mathtt{a}+(\mathtt{a}^*\mathtt{b})^*$

Due: Friday August 30