DFA - Homework 02

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Deadline: Tue 22 Aug 2017 (upload answers Google Classroom)

1. [10 points]$A_1 = \{\omega | \omega$ has an even number of 1s$\}$
2. [10 points]$A_2 = \{\omega | \omega$ contains at least one 1 and an even number of 0s follow the last 1$\}$
3. [10 points]$A_3 = \{\omega | \omega$ is the empty string ϵ or ends in a 0$\}$
4. [10 points]$A_4 = \{\omega | \omega$ contains at least one 1 and ends with 1$\}$
5. [15 points]$A_5 = \{\omega | \omega$ starts and ends with the same symbol$\}$
6. [15 points]$A_6 = \{\omega | \omega$ contains a substring 001$\}$
7. [30 points] Design an automatic door controller using a DFA. An automatic door has a pad in front to detect the presence of a person about to walk through the doorway. Another pad is located to the rear of the doorway so that the controller can hold the door open long enough for the person to pass all the way through and also so that the door does not strike someone standing behind it as it opens (Fig (1)).

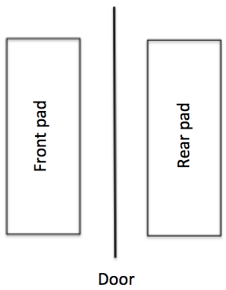

Figure 1: Door and pads