

PROJECT 1 CMSC 452. Morally DUE Feb 25
ALL DFA'S ASKED FOR NEED TO BE DRAWN NEATLY.
CIRCLE ACCEPT STATES
PUT BOXES AROUND REJECT STATES
PUT NOTHING AROUND STUPID STATES.

1. (0 points) What is your name? Write it clearly. Staple your HW. When is the midterm? Where is the midterm? When is the Final?
2. (100 points) Consider the sentence

$$(\exists A)(\forall x)[x \in A \vee x + 1 \notin A].$$

(a) Draw a DFA for the Truth sets below.

- i. $\{(x, A) \mid x \in A\}$
- ii. $\{(x, A) \mid x + 1 \in A\}$
- iii. $\{(x, A) \mid x + 1 \notin A\}$

(b) Draw a DFA for the Truth set below.

$$\{(x, A) \mid [x \in A \vee x + 1 \notin A]\}.$$

(c) Draw a DFA for the Truth set below.

$$\{A \mid (\forall x)[x \in A \vee x + 1 \notin A]\}$$

(d) Take the DFA you obtained in the last question. Test if it accepts anything.

(e) Using everything you've done determine if the following sentence is true.

$$(\exists A)(\forall x)[x \in A \vee x + 1 \notin A].$$