

# ECE374 SP23 HW1

Ziyuan Chen – ziyuanc3

Zhirong Chen – zhirong4

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## Problem 2

2: (a). Base.  $100 \in L$ .

Induction. For  $\forall a \in \Sigma, x \in L, w = ax \in L$ .

Explanation. Four in binary is 100. Its multiples also end with 100.

Regex.  $(0+1)^*100$ .

(b). Flatten the board into 1 dimension.

$L_0$  denotes strings in which O wins,  $L_x$  X wins, and  $L_D$  draws.

$000????, ???000??, ?????000, 0???0???0, \in L_0$   
 $0??0??0??, ?0??0??0?, ??0??0??0, ??0?0?0??$

$xxx????, \dots \in L_x$ . All other combinations  $\in L_D$