

CSE 694 Homework Assignment 4

Due in class on Mon, Nov 07

Problem 1. Using Valiant's theorem (Lecture 7),

- (a) Show that PAC-learning BOOLEAN CONJUNCTIONS only needs $\frac{1}{\epsilon}(n \log_2 3 + \log_2(1/\delta))$ samples
- (b) How many samples do we need to learn DNF (using DNF)?

Problem 2. Show that

- If \mathcal{H} is finite then $\text{VCD} \leq \log_2 |\mathcal{H}|$
- The set of all intervals $[x, \infty), x \in \mathbb{R}$ has $\text{VCD} = 1$.
- The set of all closed intervals on \mathbb{R} has $\text{VCD} = 2$.
- The set of all axis-aligned rectangles on \mathbb{R}^2 has $\text{VCD} = 4$

Problem 3. Exercise 3 from Lecture 8.

Problem 4. Exercise 1 from Lecture 9.

Problem 5. Exercise 2 from Lecture 9.

Problem 6. Exercise 2 from Lecture 10.