

Statistics 592C, Problem Set 4

Wellner; 1/29/99

Reading: VdV&W, Section 2.5 and 2.6, pages 127 - 153.

Due: Wednesday, February 3, 1999

1. Suppose that \mathcal{C} and \mathcal{D} are two VC collections of subsets of \mathcal{X} . Show that $V(\mathcal{C} \cup \mathcal{D}) \leq V(\mathcal{C}) + V(\mathcal{D})$. (This quantifies (iii) of Lemma 2.6.17, VdV&W, page 147.)
2. Suppose that \mathcal{C} is a VC class of sets in \mathcal{Y} , and ψ is a function mapping \mathcal{X} into \mathcal{Y} , show that $V(\psi^{-1}(\mathcal{C})) \leq V(\mathcal{C})$ with equality if ψ is onto \mathcal{Y} . (This quantifies (v) of Lemma 2.6.17, VdV&W, page 147.)
3. Problem 2.6.14, VdV & W page 152, the hyperplanes part.