3^{rd} Exercise Sheet, Set Theory of the Real Line, WS 2014/2015

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Exercise 5

Let $\mathcal{K}$ be the σ-ideal of compact subsets of ω^ω. Show that

$$\mathsf{add}(\mathcal{K}) = \mathsf{non}(\mathcal{K}) = \mathfrak{b} \quad \text{and} \quad \mathsf{cov}(\mathcal{K}) = \mathsf{cof}(\mathcal{K}) = \mathfrak{d}.$$

Exercise 6

Let $\{s_n : n \in \omega\}$ be some fixed enumeration of $2^{<\omega}$ and $\{X_\alpha : \alpha < \lambda\}$ be as defined during the lecture of November, the 6th. Show that there exists an increasing sequence $\{k_n : n \in \omega\}$ such that

1. for all $n \in \omega$, $\sum_{j \leq k_n} |s_j| < k_{n+1}$
2. $\forall \alpha < \lambda \exists^\infty n (X_\alpha \cap [k_{2n}, k_{2n+1}) \neq \emptyset)$.

(Hint: look at Lemma 2.4.3 on page 55 in [BJ95])