Recursive Kernel Estimate, Recursive Partitioning Estimate, Pointwise Universal Consistency

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After introducing semirecursive estimators in the previous part of the seminar, in this presentation we go one step further and introduce recursive estimators.
In the first part of this presentation, we will define general recursive estimators and give criteria which lead to weak and strong universal consistency for a general recursive estimator. Afterwards, we look at specific recursive estimators namely the recursive partitioning estimator and the recursive kernel estimator. For both estimators, we are going to apply the general result to find criteria which imply weak and strong universal consistency.

In the second part, we introduce a new concept of consitency, namely strong universal pointwise consistency. Thereafter, we prove strong universal pointwise consistency under certain assumptions for different estimators, which were discussed in the lecture statistical learning 1 and this Seminar.

In the programming part, we first demonstrate how to implement the recursive partitioning and kernel estimate using an easy two dimensional example. We continue with a more complex example where the survival probability of the sinking of the Titanic is estimated using the recursive partitioning estimator. Here, the participants themselves can determine their probability of survival.