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*Scott Complexity*

The logic $L_{\omega_1\omega}$ is the extension of finitary first-order logic allowing countably infinite conjunctions and disjunctions. In this logic, every countable structure can be characterized up to isomorphism (among countable structures) by a single sentence known as a Scott sentence. The proof of this result reveals that a special ordinal, known as the Scott Rank of the structure, is of interest. Unfortunately, many non-equivalent definitions of Scott rank exist in the literature. In an attempt to standardize the definition of Scott rank, Antonio Montalban argued that we should define the Scott rank of $A$ to be the least $\alpha$ such that $A$ has a $\Pi_{\alpha+1}$ Scott sentence. This notion of Scott rank is robust, having many equivalent characterizations. In particular, one is able to show that this condition is equivalent to the set of presentations of $A$ being boldface $\Pi_{\alpha+1}$ in the Borel hierarchy in the space Mod$(L)$. However, when $A$ has a Scott sentence with a different complexity also has many equivalent characterizations. The notion of Scott complexity is arguably the most refined such notion which retains a connection with the Borel hierarchy. In this talk, we introduce Scott complexity and then compute the Scott complexity for several classes of structures.