THE INNER DERIVATIONS AND THE PRIMITIVE IDEAL SPACE OF A C^*-ALGEBRA

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Derivations, initially conceived in quantum mechanics, are one of the most important class of mappings on C^*-algebras. By a definition, a derivation of a C^*-algebra A is a linear map $d : A \to A$ satisfying the Leibniz rule. A derivation d of A is said to be inner if there exists an element $a \in A$ such that $d(x) = \mathrm{ad}(a)(x) = ax - xa$ for all $x \in A$.

In this talk we will outline the proof of Somerset's theorem from 1993, which states that the set of all inner derivations on a unital C^*-algebra A is norm closed (as a subset of $\mathcal{B}(A)$) if and only if a suitable constant $\mathrm{Orc}(A)$, defined in terms of a certain graph structure on the primitive ideal space of A, is finite.