Fundamental Definitions and Concepts

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A Leavitt Path Algebra (abbreviated LPA) denoted by $L_{\mathbb{F}}(\Gamma)$, is an associative algebra whose generators and relations are determined by a directed graph Γ. The first day's lectures will start with the definitions of a directed graph, the pre-order "leads to" on the vertices, sinks, cycles, loops, finite and infinite paths, hereditary and saturated subsets of vertices, conditions K and L on Γ. Also, the semigroup of Γ will be explained and the definition of LPA will be given, basic properties will be proven. Examples of some well-known algebras (such as matrix algebras, Laurent polynomial algebra, Jacobson-Toeplitz algebra, Leavitt algebras $L(1, n)$) will be realized as LPAs. Finally, a dictionary between combinatorial properties of Γ and algebraic properties of $L_{\mathbb{F}}(\Gamma)$ will be given. We will be working with finite digraphs and coefficients of algebra will be a field F.