A $p-$ordering is a combinatorial concept introduced by Bhargava to generalize the factorial function. K. Johnson noticed in his paper *"$p-$orderings, Fekete $n-$tuples and capacity in ultrametric spaces"* that $p-$orderings also give a construction for Fekete $n-$tuples. Fekete $n-$tuples, in turn, can be used to compute the capacity of a metric space. In this thesis, we explore some properties of capacity in compact ultrametric spaces.

When our space has algebraic structure, we show how this structure can be exploited to compute capacity. We then develop conditions for computing capacity in spaces that lack algebraic structure by studying the lattice of closed balls in the space. At the end of the thesis, we compute the capacity $n-$fold products of $(\mathbb{Z}, \rho_{p_i})$, for a set of $p-$adic metrics p_i. While this is a straightforward process when using a fixed prime, we see that allowing distinct primes on each component produces interesting results even for $n = 2$. We conjecture that these spaces have transcendental capacity.