Riemannian orbifolds are a slight generalization of Riemannian manifolds. Instead of being locally diffeomorphic to $\mathbb{R}^n$, Riemannian orbifolds are locally diffeomorphic to $\mathbb{R}^n$ modulo the isometric action of a finite group. Recently, a number of authors have examined orbifolds from the perspective of inverse spectral geometry. In light of the strong connection between spectral geometry and spectral graph theory, our project defines a graph theoretic parallel of an orbifold, called an orbigraph, and obtains spectral results about orbigraphs. The spectrum of the adjacency matrix of a $k$-orbigraph yields bounds on the number of singular (non $k$-star) vertices present in the orbigraph. The reversibility (as in Markov chains) of an orbigraph determines if it can be obtained as the quotient of a finite $k$-regular graph. Both the definition of an orbigraph and our results about them are new. (Received September 15, 2013)