The main focus of this thesis are hypercubes. In the first part, we introduce hypercubes, which form an interesting class of graphs that has practical uses in networks and distributed computing. Because of their varied applications, the thesis describes the graph-theory problems related to hypercubes such as searching for detour spanners, minimizing their maximal degree and finding multiple edge-disjoint spanners. It also overviews current results on selected hypercube problems and proposes a solution using a genetic algorithm. The genetic algorithm is designed, implemented and its performance is evaluated. The conclusion is that applying a genetic algorithm to some hypercube problems is a viable, but not the most effective method.