

The Schreier Sims algorithm is a fundamental algorithm for permutation groups. Its purpose is to find a base and a strong generating set. Representation of a group using a base and a strong generating set is the core of many other algorithms. The aim of the thesis is to give the reader a detailed description of the algorithm. We present its pseudocode together with the pseudocode of its subroutines. We analyze the complexity with respect to the given pseudocode. Similarly, we describe an efficient, Monte Carlo version of the Schreier Sims algorithm whose time complexity is nearly linear. We give a detailed description of two improved algorithms for subroutines on which this version is based. We introduce the theoretical framework needed to support the correctness of both the deterministic and the probabilistic version of the algorithm.