The ATLAS detector is designed primarily for proton-proton collisions, and potentially interesting events are selected by a three-level trigger system. We have studied the performance of the ATLAS trigger system for Pb+Pb collisions. A brief introduction to the heavy ion physics with focus on jets and some results from RHIC experiments are presented in first three chapters. Then we describe the ATLAS detector, its trigger system and three strategies for L1 trigger. We focus on the first level calorimeter trigger and propose modest changes to the default trigger strategy to address specific characteristics of heavy ion collisions at the LHC. Results from performance studies of proposed strategies are presented. We describe current status of L2 jet trigger algorithm designed for p+p collisions. Then we present developed algorithm with background subtraction adapted to heavy ion collisions and its performance.