In this thesis, we describe and analyze computerized adaptive tests (CAT), the class of psychometrics tests in which items are selected based on the actual estimate of respondent’s ability. We focus on the tests based on dichotomic IRT (item response theory) models. We present criteria for item selection, methods for ability estimation and termination criteria, as well as methods for exposure rate control and content balancing. In the analytical part, the effect of CAT settings on the average length of the test and on absolute bias of ability estimates is investigated using linear regression models. We provide post hoc analysis of real data coming from real admission test with unknown true values of abilities, as well as simulation study based on the simulated answers of respondents with known true values of ability. In the last chapter of the thesis we investigate the possibilities of analyzing adaptive tests in R software and of creating a real CAT.