

In this thesis we investigate various methods for testing independence in two-way contingency tables. The methods are explained, their advantages and drawbacks are discussed, and we also illustrate the methods on an example. Further, we compare the tests on simulated data using R statistic programming language. Based on simulation results we try to decide which test is the best choice for a situation. In particular, we investigate a new method, USP test, which is based on the theory of so called  $U$ -statistics. We therefore describe these, too. It is shown that USP test performs much better than other tests in particular cases, but fails in some others. These cases are specified and guidelines are made about when the test is advantageous to use and when it is not.