

In this thesis we deal with k -sample problem with ordered alternative. At the beginning of the thesis isotonic regression is introduced. We use isotonic regression for maximum likelihood estimation of ordered parameters. In the second chapter, we describe the $\bar{\chi}^2$ and \bar{E}^2 tests that use the knowledge of isotonic regression and are based on the likelihood ratio. The exact null hypothesis distributions of their test statistics are derived in detail. The one-sided studentized range test is also further described. At the end of the thesis, we show the use of the \bar{E}^2 test on the real data.