The Weibull distribution is one of the important distributions in life testing. The problem of estimating the Weibull parameters, and the Weibull density function is still a point of interest. In this thesis, we introduced some different classical methods for estimating the parameters, of the two-parameter Weibull distribution. Also, we introduced a Bayesian methods for such estimation. A numerical comparison, between the classical and the Bayesian estimators, through a simulation study by using the Monte Carlo method, was performed. The estimation of the Weibull density is also introduced by both a parametric method and a goodness of fit tests. Some numerical results were obtained through a simulation study to obtain the critical values for some well known statistics, beside the power function for these tests.