This thesis is focused on the L_1 regression, a possible alternative to the ordinary least squares regression. L_1 regression replaces the least squares estimation with the least absolute deviations estimation, thus generalizing the sample median in the linear regression model. Unlike the ordinary least squares regression, L_1 regression enables loosening of certain assumptions and leads to more robust estimates. Fundamental theoretical results, including the asymptotic distribution of regression coefficient estimates, hypothesis testing, confidence intervals and confidence regions, are derived. This method is then compared to the ordinary least squares regression in a simulation study, with a focus on heavy-tailed distributions and the possible presence of outlying observations.