In this work we study algorithms for cluster analysis and their application to the real data. In the beginning, the various types of data are presented. We define dissimilarity measures for each type of data and for clusters to be able to do the clustering and evaluate the separation quantitatively. In the Chapter 2, there are described partitioning algorithms and some criteria to determine the optimal number of clusters. A part of this chapter is devoted to the fuzzy cluster analysis which is a generalization of partitioning techniques. Hierarchical algorithms are characterized in Chapter 3 as well as criteria for choosing the appropriate method. In the very end of this chapter, there is a comparison of all the methods in terms of various types of the separation functionals. Archetypal analysis, which is another data mining instrument, is described in Chapter 4. All chapters include illustration examples of usage. The main application part is the last chapter of this diploma thesis and it's based on the lifestyle survey in the Czech republic.