In this thesis we focus on the NCA algorithm, which is a modification of k-nearest neighbors algorithm. Following a brief introduction into classification algorithms we overview KNN algorithm, its strengths and flaws and what lead to the creation of the NCA. Then we discuss two of the most widely used modifications of NCA called Fast NCA and Kernel (fast) NCA, which implements the so-called kernel trick. Integral part of this thesis is also a proposed algorithm based on KNN (/NCA) and Linear discriminant analysis titled TSKNN (/TSNCA), respectively. We conclude this thesis with a detailed study of two real life financial problems and compare all the algorithms introduced in this thesis based on the performance in these tasks.