

Generating Frequent and Rare Association Rules Using Multi-objective Approach

Abstract

Association rule mining is one of the important tasks of data mining intended towards decision support. Basically it is the process of finding some relations among the attributes/attribute values of a huge database. Inside the huge collection of data stored in a database, some kind of relationships among various attributes may exist. Discovery of such relationships will help in taking some decisions. Finding these relationships within a vast amount of data is not a simple job. The process of extracting these relationships is termed as association rule mining. Association rule mining can be of two types: frequent association rule mining and rare association rule mining. Frequent association rule mining attempts to generate frequent rules, i.e. rules having higher support and confidence. On the contrary, rare association rules correspond to rare, or infrequent itemsets, as opposed to frequent ones that are targeted by conventional pattern miners. The rare association rule mining generate rare rules which have lower support but high confidence. Rare rules reflect regularities of local, rather than global scope that can nevertheless provide valuable insights to an expert, especially in areas such as genetics and medical diagnosis where some specific deviations/illnesses occur only in a small number of cases. So, both rare as well as frequent rule generation is required. However, based on our survey, it has been observed that researchers have considered the problem of frequent & rare rule generation separately. In this work, an attempt has been made to develop a multi-objective rule generation technique, which can be found to be capable of generating both frequent and rare association rules. The proposed rule generation technique was evaluated based on real life UCI ML repository dataset and the result has been found satisfactory.

Keywords: Association rule mining, Multi-objective association rule mining, Frequent rule generation, Rare rule generation.