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Abstract
Data mining technology is becoming more and more important recently. It is generally applies to various commercial areas. Many of data mining algorithms try to improve efficiency or to save memory continuously. In this thesis, our study is focus on association rules and sequential patterns, and proposes some improved algorithms.
First of all, we propose a new algorithm – IDA (Intuitional Decomposition Algorithm). IDA basically uses intuitional decomposition method of transaction itemsets, and generates association rules. It doesn't need to generate candidate itemsets, and only scan database twice. The process of decomposition is very intuitional and effective on improving performance of mining. Furthermore, we propose IDA_TP (Intuitional Decomposition Algorithm include Time and Place) by modifing the calculation on support and confidence in order to mining in chain of retail stores. Moreover, we adopt IDA algorithm to mining multi-time interval sequential patterns and propose MI-IDA(Multi-time Interval Intuitional Decomposition Algorithm).
However, IDA Algorithm is not perfect. So we aim at the defects of IDA, and rectify them. Therefore, we propose a new algorithm GDA(Gradational Decomposition Algorithm) and it doesn't use intuitional decomposition in IDA. Instead, GDA uses gradational decomposition to improve mining efficiency. Gradational decomposition can take less decomposition work, and has a lot of chance to finish mining in advance. So GDA can spend less time and less memory requirement obviously, and has a good performance on mining. We adopt GDA to mining a chain of retail stores and call it GDA_TP. Similarly we adopt GDA to mining multi-time interval sequential patterns and call it MI-GDA. Both algorithms have satisfied performance.
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