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A Cloud Services Recommendation System Based on Fuzzy Formal Concept Analysis

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Abstract

Cloud computing is an attractive paradigm which offers variant services on demand. Many available cloud services offer the same or similar functionalities, which made it challenging for cloud users to choose a suitable service that meets with their preferences. Existing service selection approaches were not enough to solve this challenge. That's why researchers went for recommendation approaches trying to find a solution. Cloud service recommendation has become an important technique for cloud services. It helps users decide whether a service satisfies their requirements or not. However, two main recommendation problems remain unsolved yet, data sparsity and cold start. In addition, existing solutions mostly tried to adapt techniques inherited from Web service and e-commerce domains. This approach is not always adequate due to many reasons such as the cloud architecture, the various service models, etc. To address the problems stated above, we propose a *Collaborative Filtering* based recommendation system for cloud services using Fuzzy Formal Concept Analysis (Fuzzy FCA). Fuzzy FCA has a solid mathematical foundation and it's based on the *lattice theory*. The lattice representation will give an explicit description of our cloud environment (users, services, ratings, etc.) and, then, extract the pertinent information from it (similar users to an active user, ratings of each similar user, top services, etc.) which will make the recommendations more suitable. Experimental results confirmed our expectations and proved the efficiency of such an approach.

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