Topical Associations

In every conversation with the user, our system will find the Intent or 'topic' of the conversation using Alexa's existing functionality. We will then utilize this topic to find associations in users' knowledge graphs. For this purpose, we will use a special algorithm – 'Graph Clustering Association Rules Mining Algorithm(GCAR)' . It is an optimization of the Apriori algorithm which is a classic algorithm in association rule mining.

In the GCAR graph G, the topics from each conversation are added as a subgraph G', where each node is a topic and the adjacent nodes are related topics. Each time a topical transition is triggered, the corresponding topic set is invoked and a counter of 1 is added to the edge between the current topic and the next topic. With each conversation, counters keep on increasing and the topical transitions is made to the node with greater counter value of the current topic and the prospective new topic.

Iteratively, the frequent topics set are eliminated from graph G, to reduce redundancy. Thus, a large knowledge graph G with topics as nodes and the counters on edges indicate the best topical transitions in G.

The two main advantages of using GCAR are:

1. The reduction of database scans
2. The elimination of frequent topic set