Associated Map and Inter-Purchase Time Model for Multiple-Category Products

Authors : Ching-I Chen

Abstract : The continued rise of e-commerce is the main driver of the rapid growth of global online purchase. Consumers can nearly buy everything they want at one occasion through online shopping. The purchase behavior models which focus on single product category are insufficient to describe online shopping behavior. Therefore, analysis of multi-category purchase gets more and more popular. For example, market basket analysis explores customers' buying tendency of the association between product categories. The information derived from market basket analysis facilitates to make cross-selling strategies and product recommendation system. To detect the association between different product categories, we use the market basket analysis with the multidimensional scaling technique to build an associated map which describes how likely multiple product categories are bought at the same time. Besides, we also build an inter-purchase time model for associated products to describe how likely a product will be bought after its associated product is bought. We classify inter-purchase time behaviors of multi-category products into nine types, and use a mixture regression model to integrate those behaviors under our assumptions of purchase sequences. Our sample data is from comScore which provides a panelist-label database that captures detailed browsing and buying behavior of internet users across the United States. Finding the inter-purchase time from books to movie is shorter than the inter-purchase time from movies to books. According to the model analysis and empirical results, this research finally proposes the applications and recommendations in the management.