

Applying Graph Mining to Rent Analysis Considering Room Layouts Targeting at Rental Apartments around 3LDK Type in the Suburb of Kyoto City

Using a large amount of real estate data that flows via the Internet, many Hedonic approaches estimating the rent or prices of houses or apartments have been attempted. In those attempts, distance from the nearest station, room size, and building age have been considered to be main determinants. However, floor plan that seems to be also an important determinant has not been considered enough so far since it is difficult to be modeled. In this research, we modeled the floor plans of family-oriented apartments in the suburb of Kyoto City as adjacent graphs, and extracted subgraphs that existed commonly in multiple adjacency graphs using a graph mining method. Then, subgraphs that were strongly associated with building age or rent were analyzed applying Emerging Patterns. Finally, we constructed multiple regression models for estimating the rent. It was found that the isolation level of a dining, existence of separate kitchen, and the position of a Japanese-style room, etc. were related to the rent. Moreover, the regression model considering the effect of subgraphs achieved the highest accuracy. Thus, this study opened the opportunity to introduce knowledge of architectural planning to estimate real estate prices or rents.