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Comparison of K-Nearest Neighbor and Neural Network for Forecasting Occupancy Rate at Hotel XYZ

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Abstract: The occupancy rate of a hotel is an important factor to see the development of providers business performance. By forecasting occupancy rate, the hotel can identify business opportunities or adjust room prices, determine hotel operations, and take this into consideration for strategic decision making. In this study, occupancy rate forecasting for Hotel XYZ was carried out by comparing the k-nearest neighbor (k-NN) and neural network methods. The dataset used in this study included rooms available, rooms sold out, and available occupancy percentage data in Hotel XYZ from April 2018 to June 2023. The simulation was carried out by dividing the data into training data and testing data with a ratio of 70:30 and 80:20. Model creation was carried out by applying the k-NN and neural network methods to the Hotel XYZ data set. Forecasting results that were obtained using k-NN showed an optimal RMSE at 70%:30% split of data with an RMSE of 0.080 at k-value 3, while forecasting results obtained using the neural network showed an optimal RMSE at 70%:30% data split with an RMSE of 0.007 for two hidden layers. The comparison of results of forecasting by k-NN and neural network showed an optimal RMSE when using neural network method with an RMSE of 0.004, a GAP of 0.076 compared to using k-NN. The results of this study can be used by Hotel XYZ to make better decisions in determining hotel policies in the future and goals set by the hotel.

Keywords: *hotel; occupancy rate; forecasting; k-nearest neoghbor; neural network.*

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