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GENERALISATION OF NEURAL NETWORK MODEL IN PREDICTING HOUSE PRICE PERFORMANCE

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Housing industry has been a very important sector in the Malaysian economic growth. The lack of a comprehensive national housing policy has resulted in a highly speculative housing price market. Literature reviews reveal the needs to have a systematic model to overcome the problem of predicting the house price in Malaysia. Buyers can use the model to see if a house has been priced correctly and on the other hand developers can check if a profit or loss has incurred.

The study concentrates on the used of neural network (NN) particularly the multilayer perceptron (MLP) tool in predicting the price of terrace houses in Selangor, using INSPEN as the major reference. The ability to deal with nonparametric variables, which are found in the housing industry, is a major advantage of NN modelling. NNs are easy to use for fast pattern recognition without building a system of simultaneous equations and able to automatically determine/capture possible latern functions existing in historical data, without the intevention of subjective hypothesis. It also has significant advantages over conventional rule or frame based, expert system approaches in some applications since NN do not require knowledge to be formalized. Other techniques such as regression and heuristics could not give a precise prediction

in the price movements because price movements forecasting is an example of the real world system in that they change over time.

Housing data from 1994 to 1997 which were released by INSPEN, were used for predicting the prices. Variables involved in determining the price are the year the data was collected, land and build up area, type of land ownership, type and age of the house, distance from town, the environment and building quality. Data were pre-processed, represented and rescaled before being separated into training and test sets. The pre-processing activity has taken care of the missing variables, default values and unreliable and inconsistent data fields in the housing database. Variables that have been represented by binary pattern 0 or 1 are the type of terrace houses, type of land ownership, as well as area and building qualities. Variables which were rescaled are land and build up area, age of the house, distance from town and the house price. Rescaling process was performed so as to represent the values in the range between 0 and 1.

The best price model consists of one input layer with nine nodes, one output layer with one node and one hidden layer with five nodes. The predictive and generalisation abilities of the model were tested. Results obtained from MLP are comparable to the ones obtained from regression, which shows that MLP possess considerable potential as an alternative to regression for prediction purposes as well as useful and effective in modelling and analysing real estate markets.

This study has revealed that further work can be done to enhance the obtained price model. Issues like data pre-processing technique, initial weight for simulation, price movement and factors such as the economic growth, income per capita and hedonic characteristic can be considered in the process of producing the price model. Further work can also be done on other types of houses such as bungalows and flats. This study therefore has opened new avenues for future research.