1. Research on Automatic Pricing and Replenishment Decision of Vegetable Commodities Based on Penalty Function LSTM Model

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Abstract: This paper mainly proposes an optimization model for supermarket vegetable sales. By establishing the distribution law of sales volume, the relationship between category and item sales volume, and the fitting model of the relationship between sales volume and cost plus pricing, the paper aims to make replenishment and pricing decisions for supermarket, so as to achieve better operating earnings. The graph of past sales volume is drawn and the cyclical and seasonal trends of sales volume are found. Taking the month as the classification unit, the distribution relationship of the sales volume of each category and single product with the month is established. The trend of merchandise sales and the impact of holidays on sales are analyzed. Spearman coefficient analysis was used to study the correlation between category and single product, and the combination of category and single product with strong correlation was found. The weighted average method was used to evaluate the different contribution degree of each item to its category, and the daily selling price of each item was calculated. Based on the reasonable assumption, the profit model of supermarket is established, and the sales volume and markup rate are positively correlated with the profit of supermarket. The penalty function-LSTM model is used to fit the relationship between sales volume and selling price to realize the pricing strategy of price maximization. This paper forecasts the daily replenishment volume and sales price from July 1 to 7. In general, this paper comprehensively uses statistical analysis, weighted average, penalty function-LSTM model and other methods to solve the problem of supermarket vegetable sales, and provides relevant decision-making suggestions and strategies. © 2023 IEEE.