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In Collaboration with
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Inventro - Smart Restaurant Kitchen Inventory Management Mobile Application

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Abstract

Problem: Traditional inventory management in restaurant kitchens has been manual and thus prone to human error. This has led to risks of overstocking or stockouts, which can result in massive consequential losses. In this project, the author proposes a machine learning-based inventory depletion forecasting system that places orders for replenishment to optimize stock levels and minimize waste.

Methodology: A predictive analytics model is adopted for the project and developed using machine learning techniques to predict the inventory requirements from the historical consumption data. RandomForestRegressor models were developed to forecast how long it would take for inventories to deplete using data pre-treatment techniques of normalization and reduction of outliers. The system was designed and developed as cloud-based to simplify upgrading and integrating various opera without including IoT hardware components.

Initial Results: Preliminary testing of the prototype had promising results, showing a R^2 value of 0.865 on the test dataset, which reflected a high degree of accuracy in its ability to forecast the days until stock depletion. Other additional evaluation metrics, such as RMSE and R-squared, are being computed with a view to further improving the precision and usefulness of the model.

Subject Descriptors: Information systems → Applications of information systems → Decision support systems → Data analysis Computational techniques Machine learning → Machine learning algorithms → Regression algorithms

Keywords: Inventory management, machine learning, predictive analytics, Random Forest regression, restaurant kitchens