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# Black Orthodox Tea Grades Demand Prediction System

A dissertation by

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Submitted in partial fulfilment of the requirements for the BEng (Hons)

Software Engineering Degree Department of Computing

BEng/BEng (Hons) in Software Engineering

**May 2019**

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## Abstract

Tea export can be considered as an important industry in the Sri Lankan economy, contributing a noteworthy add up to the gross domestic product (GDP). Because of various factors, the tea price seems to fluctuate drastically. Resulting in the sudden market fluctuations tea factories consolidates with massive trading losses and profits making the cash flow within the factory unstable. Considering the flimsy cash flow, tea manufacturing factories face issues while paying its dues to its supplies influencing its supplies to lose confidence towards production line. Resulting in this, the number of tea manufactures diminishes making the income of a factory more delicate and forcing the manufacturers to go defaults on loans, payments, banking facilities and finally resulting in a foreclosure of the business. This project focused on developing a tool that can identify which grades of tea will attract more and which grades of tea will get less attraction at the tea auction in the coming weeks and present the user with a collection of best suited mainstream grades in the prevailing market condition, so the manufacturers can quickly change the manufacturing process to yield maximum benefits.

The proposed system is a web-based system which will accept most recent past sales data of a specific tea factory as input through an interface and accurately predict suitable mainstream grades in the prevailing market condition to a specific factory. The system comprised of three main sections namely a recurrent neural network to predict future prices, a classification-based neural network to accurately classify the grades according to market attraction and a novel algorithm to predict and classify best suited mainstream grades in the prevailing market condition. Furthermore, extensive testing was carried out utilising various factories to verify the functionality of the developed system.

**Keywords:** Tea Grades Demand Prediction, Classification, Recurrent Neural Network, Time series prediction