

# 7SENG013C Software Development Project 2022/23

## **Implement Machine Learning Model to Identify Spectral Star Type from Spectroscopic Data**

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## ABSTRACT

This study introduces a novel approach utilizing a Random Forest classifier to precisely classify stars into distinct spectral classes. The research employs spectral wavelength data from the SDSS 17 dataset and leverages a Random Forest model with 39 estimators. This model aims to achieve accurate categorization of stars based on their unique spectral characteristics, thereby automating and improving efficiency in star classification within extensive astronomical surveys. The presented Random Forest model comprises multiple decision trees, each trained on different subsets of the data. By combining their outputs, the model enhances its ability to capture relevant patterns from spectroscopic data. Through thorough training and validation, the model demonstrates a promising accuracy of 74%, indicating its effectiveness in this task. This advancement contributes significantly to the field of astronomy by facilitating the automated categorization of stars and aiding in the progress of astronomical research.

**Keywords: Random Forest Classifier, Astronomy, Spectral Classes, Sloan Digital Sky Survey**