**Assignment 7**

**Objective**: Develop machine learning models to predict the income status of customers based on their spending score and demographic information.

**Dataset**: Use the ‘Adult Income’ dataset from the UCI Machine Learning Repository. This dataset is more comprehensive and includes variables such as age, workclass, education, occupation, relationship, race, sex, capital gain/loss, hours per week, and income. It provides a broader perspective for modeling income. The dataset is available at UCI Machine Learning Repository – Adult Income Dataset.

**Tasks:**

1. Data Preparation:

* Load and preprocess the dataset. Handle missing values, encode categorical variables, and normalize the data as needed.
* Split the dataset into training and test sets.

1. Model Implementation:

* Implement at least three different machine learning models (e.g., linear regression, decision tree, random forest, logistic regression, SVM).
* You can treat income as a continuous, binary (e.g., '>50K' or '<=50K'), or ordinal variable.

1. Model Tuning:

* Tune the hyperparameters of each model for optimal performance.
* Use cross-validation to ensure robustness.

1. Model Evaluation:

* Evaluate the models using appropriate metrics (e.g., MAE, RMSE for continuous; accuracy, F1-score for classification).
* Compare the performance of the models.

1. Interpretation and Reporting:

* Briefly interpret the results of the models. Discuss which model performed best and why.
* Prepare a one-page report summarizing your findings, methodology, and insights.

1. Coding and Documentation:

* Ensure the code is well-documented and legible. Include comments and explanations to make it understandable.

**Submission**: A one-page written report in PDF format detailing the results and a Jupyter Notebook containing the code. Send those to the “announced” e-mail address. Name your files as follows: Name\_Surname\_Assignment7.