Detailed Project Report

Adult Census Income Prediction

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| **Project Title** | **Adult Census Income Prediction** |
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| **Technologies** | **Machine Learning Technology** |
| **Domain** | **Finance** |
| **Project Difficulties** | **level Intermediate** |

**Problem Statement:**

The Goal is to predict whether a person has an income of more than 50K a year or not.

This is basically a binary classification problem where a person is classified into the

>50K group or <=50K group..

**Objective:**

Adult Census Income Prediction is Machine Learning Classification model based modelling which used to predict income group of a person and take necessary actions

**Benefits:**

The solution proposed here is ACI is used to perform above use cases . If there any persons with less than 50k income it categorizes into less category and vice versa . This study help in knowing the economy of a country and it helps in solving income equality problem.

**Architecture**

Data Visualization

Data Pre-processing

Data Collection

Start

Cloud Setup

Model Saving

Hyperparameter Tuning

Get best model for each classification

Export data from database to csv to prediction

Prediction

Application Start

End

Deployment

**Architecture Description:-**

**Data Collection:** Data is collected from the source provided.

**Data pre-processing**

Performing EDA to get insight of data like identifying distribution , outliers ,trend among data etc.

Check for null values in the columns. If present impute the null values.

Encode the categorical values with numeric values.

Perform Standard Scalar to scale down the values.

**Data Visualization:** Visualization is done to understand the data set

**Clustering :**

Machine Learning algorithm is used to create clusters in the pre processed data. The

optimum number of clusters is selected by plotting the elbow plot, and for the

dynamic selection of the number of clusters . The idea behind clustering is to implement different algorithms on the structured data

The ML model is trained over pre processed data, and the model is saved

for further use in prediction

**Model Selection :**

After the clusters are created, we find the best model for each cluster. By using

Machine Learningalgorithm. For each cluster both the hyper tunned

algorithms are used. We calculate the AUC scores for both models and select the

model with the best score. Similarly, the model is selected for each cluster. All

the models for every cluster are saved for use in prediction

**Prediction:**

* The testing files are shared in the batches and we perform the same Validation operations ,data transformation and data insertion on them.
* The accumulated data from db is exported in csv format for prediction
* We perform data pre-processing techniques on it.
* Machine learning model created during training is loaded and clusters for the pre processed data is predicted
* Based on the cluster number respective model is loaded and is used to predict the data for that cluster.
* Once the prediction is done for all the clusters. The predictions are saved in csv format and shared.

Question & Answers

Q1) What’s the source of data?

Ans) The Dataset was taken from iNeuron’s Provided Project Description Document.

2: Is data cleaned before using?

Ans.: Yes

Q 3) What was the type of data?

The data was the combination of numerical and Categorical values.

Q 4) What techniques were you using for data pre-processing?

* Removing unwanted attributes
* Visualizing relation of independent variables with each other and output variables
* Checking and changing Distribution of continuous values
* Removing outliers
* Cleaning data and imputing if null values are present.
* Converting categorical data into numeric values.

Q 5) How training was done or what models were used?

* Before diving the data in training and validation set we performed clustering over fit to divide the data into
* clusters.
* As per cluster the training and validation data were divided.
* The scaling was performed over training and validation data
* Algorithms like  Linear Regression, Logistic Regression, Decision Trees and Random Forest were used based on the recall final model was used for each cluster and we saved that model .