

**WiDS ‘22 - ‘23 Final Documentation**

**6 – Credit card fraud detection**

**Joshi Meet Anilkumar**

|  |  |  |
| --- | --- | --- |
| **Team Member Name** | **Roll Number** | **Email-Id** |
| Ponaveni Jai Shyam Yadav | 22N0265 | 22N0265@iitb.ac.in |

**Introduction to Problem Statement**

|  |
| --- |
| We have been provided with a dataset consisting of details of the transaction of the European Bank. We need to use multiple Machine Learning algorithms to detect the fraudulent transactions and the non-fraudulent transaction. |

**Existing Resources**

|  |
| --- |
| Kaggle  YouTube videos python libraries  Geeks for Geeks |

**Proposed Solution**

|  |
| --- |
| Predicted fraud transactions of bank data using Logistic Regression and Random Forests  • Used resampling techniques such as SMOTE to address the issue of class imbalance  • Performed hyperparameter tuning using Grid Search to derive optimal hyperparameter values for the model  • Determined the optimal model based on criteria F1 score with a Recall value of 0.8705 |

**Methodology & Progress (Mention the work done week-wise)**

|  |
| --- |
| Week 1: Brush-up basics of python, pandas & matplotlib library. Done EDA of data. Learned some basic machine-learning algorithms which we can apply to our project.  Week 2: From this, I started data analysis and found the insight (only using visualization) from the data and made a report in a python file regarding the data.  Normalizing data, data balance (using sampling and SMOTE), and data cleaning.  Week 3: Start applying different machine learning algorithms to the data.  Week 4:·Cleared doubt regarding the algorithm and its application Started  Making a report of your work while doing all the application |

**Results**

|  |
| --- |
| GitHub link:  <https://github.com/ijaishyam/Credit-card-fraud-detection> |

**Learning Value**

|  |
| --- |
| Learned new Machine learning algorithms that can be applied in real-world data to improve the accuracy of models to give a precise decisions to solutions related to business.  Developed intuition of which algorithm to apply along with techniques to handle data that are not very nice (dirty data).  Was exposed to python and its libraries which helped me in building logical thinking in python  This project acted as an initiator for me in the field of Data Science to gain some hands-on experience with a real-world dataset |

**Tech-stack Used**

|  |
| --- |
| Jupyter Notebook  Python  Pandas  NumPy  Matplotlib  Seaborn  Sklearn |

**Suggestions for others**

|  |
| --- |
|  |

**Contribution by each Team Member**

|  |
| --- |
|  |

**References and Citations**

|  |
| --- |
| Pandas:<https://www.youtube.com/watch?v=CmorAWRsCAw&list=PLeo1K3hjS3uuASpe-1LjfG5f14Bnozjwy>  Matplotlib: :<https://www.youtube.com/watch?v=3Xc3CA655Y4&ab_channel=freeCodeCamp.org>  Resource:  <https://www.youtube.com/watch?v=gmvvaobm7eQ&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=1&t=0s>  <https://www.geeksforgeeks.org/machine-learning>  https://www.youtube.com/playlist?list=PLu0W\_9lII9ai6fAMHp-acBmJONT7Y4BSG  <https://www.youtube.com/watch?v=DQC_YE3I5ig&ab_channel=JohannesFrey>  https://www.youtube.com/watch?v=JnlM4yLFNuo&ab\_channel=codebasics |