FREEDOM OF THE WORLD CLASSIFICATION

AN INUSTRY ORIENTED MINI REPORT

Submitted to

JAWAHARLAL NEHRU TECOLOGICAL UNIVERSITY, HYDERABAD

In partial fulfillment of the requirements for the award of the degree of

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

Submitted by

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DEPARTMENT OF

COMPUTER SCIENCE AND ENGINEERING

VAAGDEVI ENGINEERING COLLEGE(WARANGAL)

CERTIFICATE OF COMPLETION

INDUSTRY ORIENTED MINI PROJECT

This is to certify that the UG Project Phase-1 entitled "FREEDOM OF THE WORLD CLASSIFICTION" is being submitted by MEGHANA NAGAVELLI (21UK1A05B6), VENNELA MENDU (22UK5A0511), DHANUSH KANUKUNTLA (21UK1A0592) in partial fulfillment of the requirements of the award of the degree of Bachelor of Technology in Computer science & Engineering to Jawaharlal Nehru Technological University Hyderabad during the academic year 2024-2025.

Project Guide	**HOD**
A. ASHOK KUMAR	**Dr. Naveen Kumar**
(Assistant Professor)	(Professor)

External

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ABSTRACT

The freedom of the world classification is encompasses various interpretations and perspectives depending on cultural, political, and social contexts. From a political standpoint, freedom often refers to the ability of individuals to act without undue interference or restraint, typically guaranteed by laws or norms. This includes freedoms such as freedom of speech, freedom of assembly, and freedom of religion. Socially, freedom can also relate to personal autonomy and the absence of oppression or coercion. The freedom to pursue one's goals and aspirations without systemic barriers based on gender, race, or socioeconomic status, interpretations that are influenced by historical, cultural, political, and philosophical factors. Philosophically, freedom can be explored in terms of existential freedom the ability of individuals to make meaningful choices and take responsibility for their actions. This perspective delves into questions of free will versus determinism and the philosophical implications of human agency.

TABLE OF CONTENTS:-

1.INTRODUCTION

1.1. OVERVIEW

It encompasses a broad spectrum of meanings, ranging from political liberties and civil rights to philosophical notions of personal autonomy and existential choice. its diverse dimensions across cultural, political, social, and philosophical contexts. Politically, it is often associated with fundamental rights such as freedom of speech, assembly, and religion, which are crucial indicators of a society's commitment to individual liberty. These freedoms form the basis of democratic governance and are enshrined in international declarations and constitutions worldwide. It involves the absence of systemic barriers that limit individuals' potential based on factors such as race, gender, or socioeconomic status. Societies that prioritize social freedom strive to create inclusive environments where all individuals can thrive and contribute meaningfully. Philosophically, freedom delves into existential questions about human agency and the nature of choice. It explores concepts of free will versus determinism, highlighting individuals' capacity to make autonomous decisions and take responsibility for their actions. Philosophical perspectives on freedom challenge us to consider the ethical implications of our choices and the moral responsibilities inherent in a free society.

In the overview, Freedom in the world is a complex and multifaceted concept that can be classified into several key dimensions: political freedoms, civil liberties, social freedoms, and philosophical perspectives on autonomy and choice. Each dimension offers unique insights into how freedom is understood, protected, and experienced globally.

1.2. PURPOSE

Freedom of the world classification serves several key dimensions: political freedoms, civil liberties, social freedoms. In detail, its purposes include:

1. **Assessment and Comparison:** By classifying freedom, we can assess and compare the extent to which different countries or regions uphold political, civil, and social freedoms. This helps in identifying trends, disparities, and areas for improvement in human rights and governance practices globally.
2. **Policy Development:** Governments and international organizations use classifications of freedom to inform policy development and diplomatic relations. Understanding where freedoms are restricted or upheld can guide efforts to promote democratic governance, rule of law, and inclusive societal practices.
3. **Education and Awareness:** Classification helps educate the public and raise awareness about the importance of freedom in fostering democracy, social justice, and individual well-being. It encourages dialogue and critical thinking about the principles and values that underpin free societies.
4. **Research and Academic Study:** Researchers and scholars use classifications of freedom to conduct studies and analyses on topics such as political development, human rights enforcement, and the impact of freedoms on societal progress. This contributes to the advancement of knowledge and informs academic discourse on global issues.

5. **International Comparisons and Indices:** Various indices and reports classify freedom based on quantitative and qualitative data, providing a standardized framework for comparing countries' performances in upholding freedoms. Examples include the Freedom in the World report by Freedom House and the Human Freedom Index by the Cato Institute.

2.LITERATURE SURVEY

2.1 EXISTING PROBLEM

- Existing problems in the classification of "freedom of the world" reveals several critical challenges that scholars and organizations. Different organizations and indices prioritize different indicators of freedom, leading to inconsistencies in classification. For example, some may emphasize political rights and civil liberties, while others include social and economic freedoms. Gathering reliable and comprehensive data on freedom can be challenging, especially in countries with restricted media and civil society. can introduce biases that impact the overall classification of freedom.
- Many existing classifications focus predominantly on political freedoms and civil liberties, often overlooking other important dimensions such as social and economic rights, cultural freedoms, environmental freedoms, and access to justice. This narrow focus may provide an incomplete picture of freedom in a given society. Freedom is deeply influenced by cultural norms, historical context, and societal values.
- Contextual factors such as economic development, levels of corruption, and ethnic diversity can significantly impact the realization of freedom within a country, complicating comparative analysis. This can distort freedom classifications and undermine their credibility. Questions arise regarding the practical impact of freedom classifications on policy decisions, international relations, and human rights advocacy. Issues such as data gaps, lack of transparency, and limitations in data collection methodologies can hinder accurate classification. Contemporary issues such as digital freedoms, add

new dimensions to the classification of freedom, requiring adaptation of existing frameworks.

2.2 PROPOSED SOLUTION

- Develop a comprehensive framework that includes indicators for political freedoms, civil liberties, social freedoms, economic freedoms, cultural freedoms, and environmental freedoms. Recognize and account for contextual factors such as cultural norms, historical context, and regional specificities in assessing freedom. Develop and adhere to ethical guidelines that prioritize inclusivity, respect for human rights, and accountability in freedom assessments. Evaluate the impact of freedom classifications on policy decisions, international relations, and human rights advocacy.

1.Standardized Methodologies and Transparent Scoring: Establish standardized methodologies for data collection, scoring, and weighting of indicators to ensure consistency and comparability across countries. Transparency in methodologies and clear documentation of scoring criteria will enhance credibility and understanding.

2.Contextual Sensitivity and Local Engagement: Recognize and account for contextual factors such as cultural norms, historical context, and regional specificities in assessing freedom. Engage local stakeholders, including civil society organizations and marginalized communities, to provide insights and validate findings.

3.Enhanced Data Quality and Accessibility: Improve data quality through investments in robust data collection mechanisms, data verification processes, and technological solutions. Promote open data initiatives to enhance accessibility and transparency of freedom-related data.

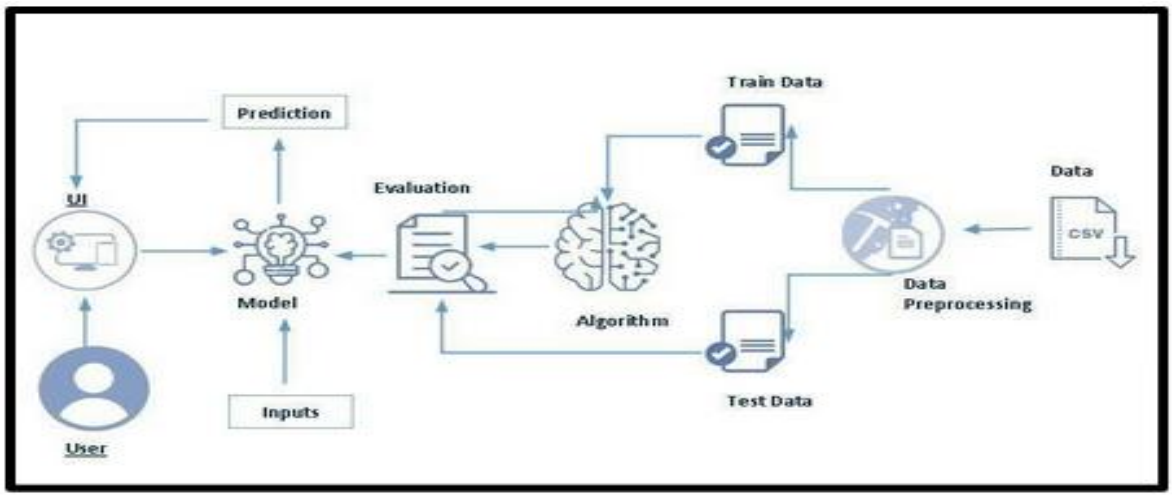
4.Ethical Guidelines and Inclusive Frameworks: Develop and adhere to ethical guidelines that prioritize inclusivity, respect for human rights, and accountability in freedom assessments. Foster inclusive participation in classification processes to incorporate diverse perspectives and ensure fairness.

5.Impact Assessment and Policy Relevance: Evaluate the impact of freedom classifications on policy decisions, international relations, and human rights advocacy. Ensure that classifications are relevant and actionable, supporting efforts to promote democratic governance and protect human rights globally.

- The Freedom of the World classification refers to the annual "Freedom in the World" report by Freedom House, which assesses the level of freedom in countries and territories. It uses indicators of political rights and civil liberties to classify countries as Free, Partly Free, or Not Free. Ensure fair and transparent elections. Support an independent judiciary. Promote checks and balances within the government. Safeguard freedom of speech, press, and assembly. Encourage political pluralism and inclusive political processes. Increase transparency in government spending and procurement. Protect journalists from harassment and violence.
- By addressing these areas, countries can work towards improving their classification in the Freedom in the World report, fostering greater political rights, civil liberties, and overall freedom for their citizens.

3.THEORITICAL ANALYSIS

3.1. BLOCK DIAGRAM



3.2. SOFTWARE DESIGNING

The following is the Software required to complete this project:

- **Google Colab**: Google Colab will serve as the development and execution environment for your predictive modeling, data preprocessing, and model training tasks. It provides a cloud-based Jupyter Notebook environment with access to Python libraries and hardware acceleration.
- **Dataset (CSV File):** The dataset in CSV format is essential for training and testing your predictive model. The below code is a simple way to load and explore "Freedom in the World 2013-2022 Dataset".
- **Data Preprocessing Tools:** Python libraries like NumPy, Pandas, and will be used to preprocess the dataset. The code allows users to quickly see the first few rows of the dataset, the size of the dataset, and the names of the columns in the dataset, which can be useful for further analysis and exploration of the data.

- **Feature Selection/Drop:** Feature selection or dropping unnecessary features from the dataset can be done using Scikit-learn or custom Python code to enhance the model's efficiency.
- **Model Training Tools:** Machine learning libraries such as will be used to develop (KNN) k-nearest neighbors model classification report for (KNN) and, (SVM) support vector machine, The Naive Bayes algorithm can be considered, depending on the Freedom in the World prediction task.
- **Model Accuracy Evaluation:** After model training, accuracy and performance evaluation tools, such as scripts, will assess the model's predictive capabilities. You'll measure the model's ability to predict the Freedom in the World categories based on historical data.
- **UI Based on Flask Environment**: Flask, a Python web framework, will be used to develop the user interface (UI) for the system. The Flask application will provide a user-friendly platform for users to input location data or view the Freedom in the World predictions, health information, and recommended precautions.
- Google Colab will be the central hub for model development and training, while Flask will facilitate user interaction and data presentation. The dataset, along with data preprocessing, will ensure the quality of the training data, and feature selection will optimize the model. Finally, model accuracy evaluation will confirm the system's predictive capabilities, allowing users to rely on the Freedom in the World predictions and associated health information.

4.EXPERIMENTAL INVESTIGATION

In this project, we have used Freedom in the World. This dataset is a csv file consisting of labelled data and having the following columns-

Based on these scores, countries are classified into three categories:

Free: Countries with high scores in both political rights and civil liberties.
Partly Free: Countries with moderate scores in either or both categories.
Not Free: Countries with low scores in both categories.

Using Freedom House Data for Experimental Investigation

Step 1: Define the Research Question

Identify a specific aspect of political freedom or civil liberties you want to investigate. For example:

- How does access to independent media affect political engagement in "Not Free" countries?
- What is the impact of educational programs on civic participation in "Partly Free" countries?

Step 2: Design the Experiment

Depending on the research question, you can design different types of experiments:

- **Randomized Controlled Trials (RCTs)**: Randomly assign different interventions (e.g., access to independent media) to different groups and measure the outcomes.
- **Field Experiments**: Implement interventions in a real-world setting and observe the effects.

- **Natural Experiments**: Analyze naturally occurring events or policy changes to see their impact on political freedom.

Step 3: Data Collection

1. **Freedom House Data**: Use the Freedom in the World report to get the classification and scores for the countries you are studying.
2. **Additional Data Sources**:

    - **Surveys**: Collect primary data through surveys to measure political engagement, civic participation, and perceptions of freedom.
    - **Government Records**: Obtain data on specific policies, election results, or other relevant metrics.
    - **Economic and Social Indicators**: Use data from sources like the World Bank to control for economic and social factors.

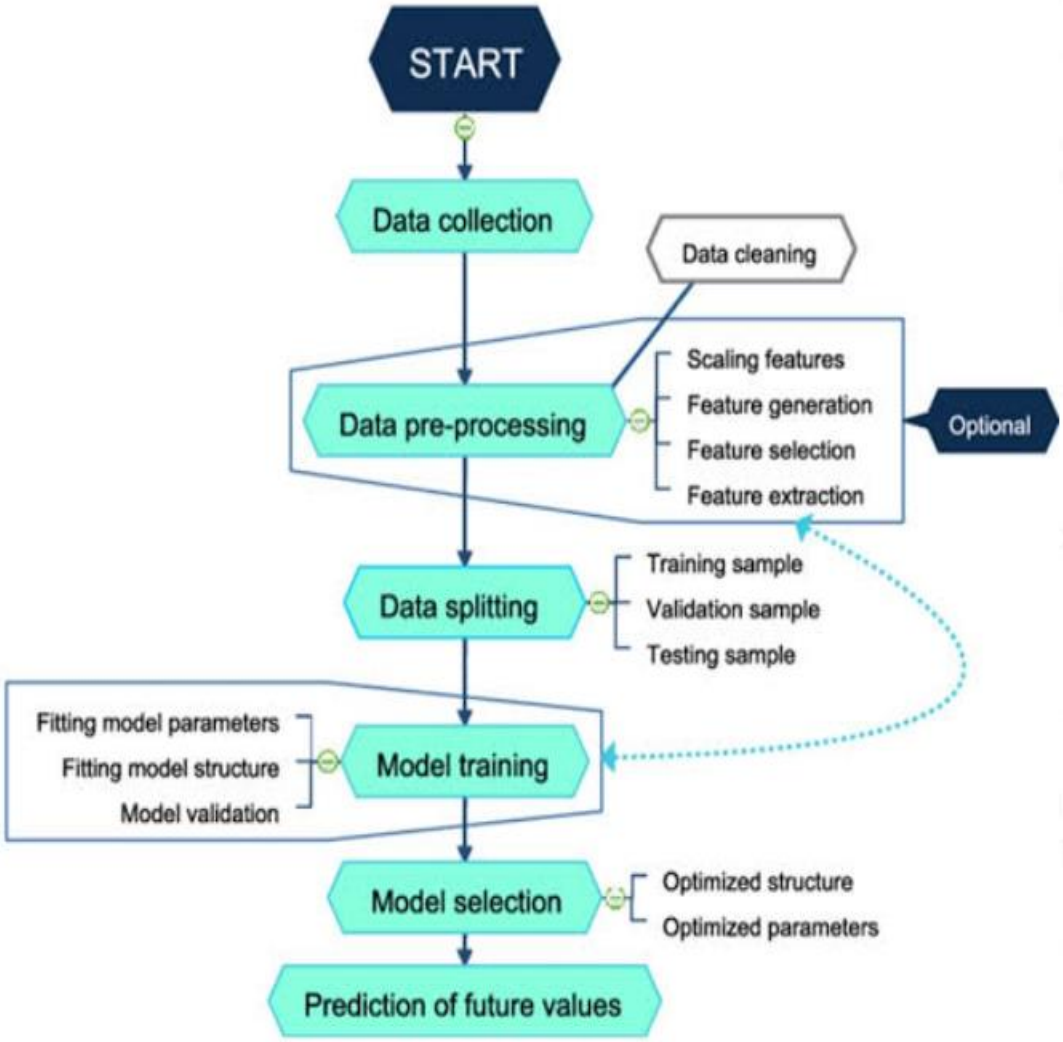
Step 4: Analysis

- **Quantitative Analysis**: Use statistical methods to analyze the data. This might include regression analysis to identify relationships between interventions and outcomes.
- **Qualitative Analysis**: Conduct case studies or content analysis of media and government reports to gain deeper insights into the effects of interventions.

Step 5: Interpretation and Reporting

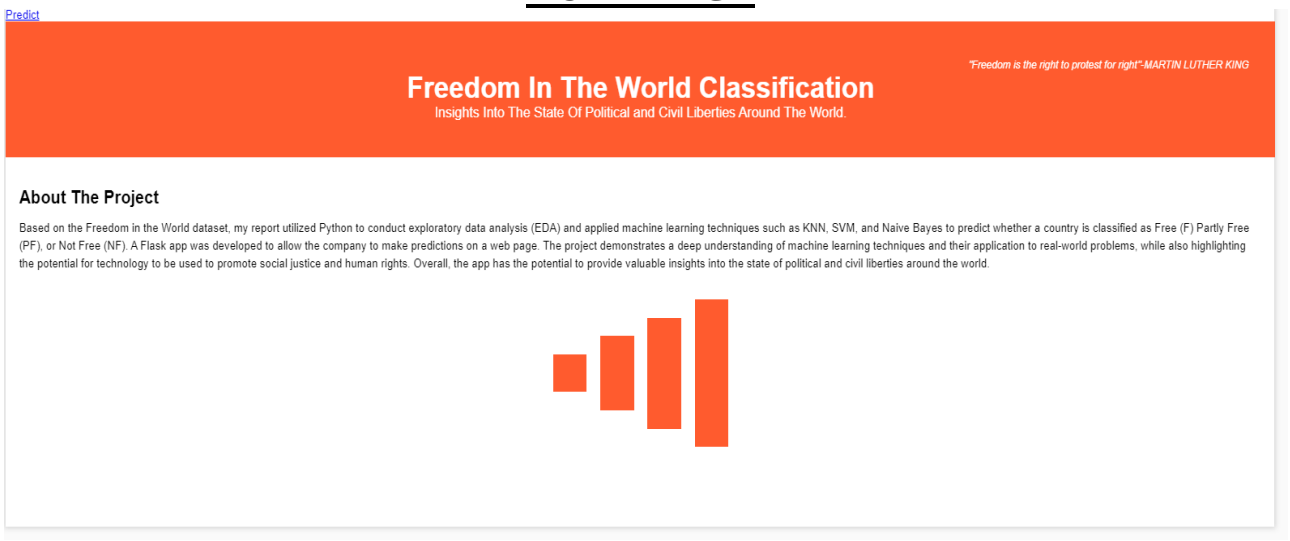
- Interpret the results in the context of the Freedom House classification. For example, compare the effectiveness of interventions in "Free," "Partly Free," and "Not Free" countries.

5.FLOWCHART

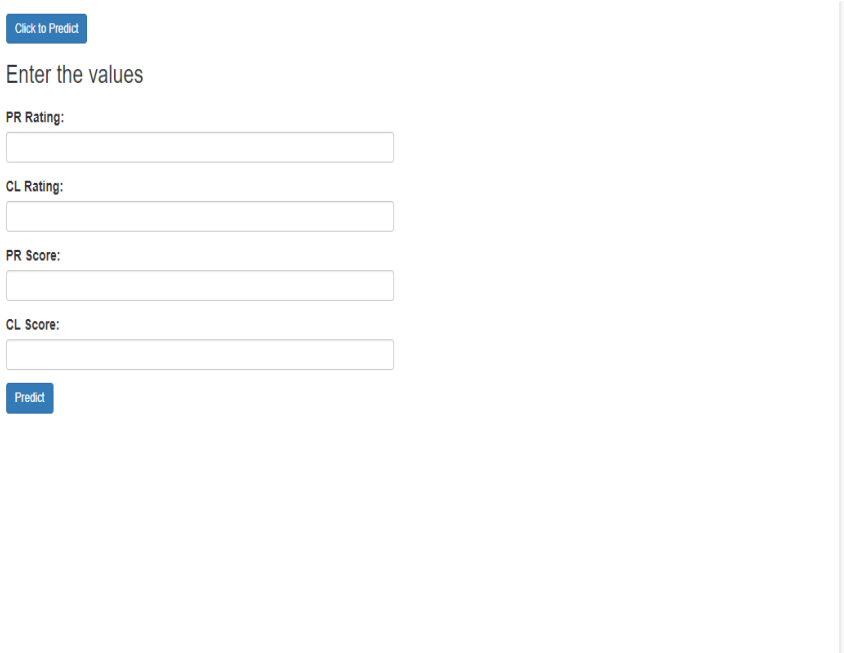

START
Data collection
Data cleaning
Data pre-processing
Scaling features
Feature generation
Feature selection
Feature extraction
Optional
Data splitting
Training sample
Validation sample
Testing sample
Fitting model parameters
Fitting model structure
Model validation
Model training
Model selection
Optimized structure
Optimized parameters
Prediction of future values

6.RESULT

HOME PAGE



PREDICTIONS



"Freedom is the right to protest for right"-MARTIN LUTHER KING

Freedom In The World Prediction

Insights Into The State Of Political and Civil Liberties Around The World.

TOTAL SCORE: 14

Freedom in the World Result

Country Classification: NF

Back to Home

7.ADVANTAGES AND DISADVANTAGES

ADVANTAGES:

1. Comprehensive Coverage

- **Global Scope**: The report covers nearly every country in the world, providing a broad and inclusive assessment of political rights and civil liberties.

2. Standardized Metrics

- **Consistency**: Using standardized metrics allows for consistent comparisons across different countries and over time, enabling longitudinal studies and cross-country analyses.

3. Detailed and Granular Data

- **Subcategory Scores**: The report breaks down the overall scores into detailed subcategories, offering insights into specific aspects of political rights (e.g., electoral process, political pluralism) and civil liberties (e.g., freedom of expression, rule of law).

4. Historical Data

- **Trend Analysis**: Historical data is available, allowing researchers to analyze trends and changes in political freedoms and civil liberties over time, providing context for current assessments.

5. Policy Relevance

- **Actionable Insights**: Policymakers can use the classifications and scores to identify areas needing improvement and to design interventions aimed at enhancing political rights and civil liberties.

6. Advocacy Tool

- **Public Awareness**: The report raises public awareness about the state of freedom around the world and can be used by activists and NGOs to advocate for reforms and to hold governments accountable.

DISADVANTAGES:

1. Subjectivity in Scoring

- **Potential Bias**: The evaluation process relies on expert assessments, which can introduce subjective biases. Different experts might interpret the same situation differently, potentially affecting the consistency of scores.

2. Limited Depth

- **Broad Metrics**: The classification provides a broad overview but may lack the depth required to fully understand complex political and civil liberty issues in specific contexts. It might not capture nuances and local variations effectively.

3. Western-Centric Perspective

- **Cultural Bias**: Critics argue that the methodology and criteria may reflect a Western-centric view of democracy and freedom, which might not fully consider cultural and contextual differences in non-Western countries.

4. Temporal Lag

- **Data Lag**: The report is published annually, meaning it might not capture rapid political changes or emerging crises in real-time. Significant events occurring after the data collection period may not be reflected until the next report.

5. Simplification

- **Reductionist Approach**: Complex political environments are often reduced to simple scores, which can oversimplify the realities on the ground. This reductionist approach might overlook important qualitative aspects of political and civil liberties.

8.APPLICATIONS

1. **search and Academic Studies**: Analyzing trends, conducting comparative studies, and assessing policy impacts.
2. **Policy Development and Evaluation**: Informing policy decisions, evaluating reforms, and allocating resources.
3. **Advocacy and Human Rights Campaigns**: Raising awareness, advocating for reforms, and monitoring violations.
4. **International Relations and Diplomacy**: Guiding foreign policy, promoting democracy, and preventing conflicts.
5. **Corporate Social Responsibility**: Making investment decisions and aligning CSR initiatives with human rights standards.
6. **Education and Public Information**: Serving as a teaching tool and informing the public about global freedom issues.
7. **Program Design and Implementation**: Designing and implementing NGO and aid programs targeting specific needs.
8. **Legal and Judicial Reforms**: Advocating for legal reforms and providing judicial training.

9.CONCLUSION

- In conclusion, the "Freedom in the World" report underscores a troubling decline in global freedom, with a significant number of countries backsliding on political rights and civil liberties. While some regions have shown resilience and progress, the overall trend indicates a growing threat to democracy worldwide. The findings highlight the need for concerted efforts by the international community, civil society, and democratic governments to counteract these trends, support democratic institutions, and uphold human rights.
- Renewed commitments to transparency, accountability, and the protection of fundamental freedoms are essential to reversing the current decline and fostering a more free and democratic world.

10.FUTURE SCOPE

Future Scope of the freedom in the classification Prediction

1. **Digital Rights and Freedoms**: Including metrics on internet freedom, data privacy, and digital surveillance.
2. **Economic Freedoms**: Incorporating measures related to economic rights, labor conditions, and the impact of economic inequality on freedoms.
3. **Sub-National Analysis**: Offering detailed assessments at regional, provincial, or city levels within countries.
4. **Crowdsourced Data Collection**: Engaging the public to contribute data and report on the state of freedoms in their areas.

5. **Cross-Index Correlation**: Aligning findings with other global indices like the Human Development Index (HDI), Global Peace Index (GPI), and Corruption Perceptions Index (CPI) for a comprehensive view.
6. **Technological Impact**: Assessing how emerging technologies, such as AI and blockchain, affect governance and individual freedoms.
7. **Training Programs**: Offering training and workshops for local organizations, journalists, and activists on how to use and interpret freedom data

11.BIBILOGRAPHY

[1] The first edition of the Survey was R. D. Gastil, "The New Criteria of Freedom," Freedom at Issue, no. 17 (January-February 1973). It has been published at least in every succeeding January-February edition of Freedom at Issue.

[2] The first Freedom House annual, Freedom in the World (New York and Boston: Freedom House and G. K. Hall), was published in 1978.

[3] See Richard Cottam, "The Case of Iran," in Gastil, Freedom in the World 1978.

[4] This issue was examined more theoretically in Freedom in the World 1979.

[5] For an extended discussion of these issues see Freedom in the World 1978.

[6] For more extended discussions of this issue see Freedom in the World 1978 and Freedom in the World 1979.

[7] See Ram Joshi and Kirtidev Desai, "Toward a More Competitive Party System in India," Asian Survey, XVIII, no. 11 (November 1978), 1091-1116

[8] Ergun Özbudun, Social Change and Political Participation in Turkey (Princeton: Princeton University Press, 1976), and Samuel Huntington and Joan Nelson, No Easy Choice (Cambridge: Harvard University Press, 1976).

[9] For this discussion compare Herbert Aptheker, The Nature of Democracy and Freedom (New York: International Publishers, 1967), especially.

[10] C. B. Macpherson, The Real World of Democracy (New York: Oxford University Press, 1966).

[11] Aptheker, The Nature of Democracy and Freedom.

[12] For our definition of freedom see Freedom in the World 1978.

[13] This analysis-is developed in Freedom in the World 1978.

[14] See International Institute for Strategic Studies, The Military Balance 1979-80 (London, 1979), especially.

[15] For a discussion of this affair see Freedom in the World 1978.

12.APPENDIX

Model building:

1)Dataset

2)Google colab and VS code Application Building

1. HTML file (Index file, Predict file)
2. CSS file
3. Models in pickle format

SOURCE CODE:

INDEX.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <title>Freedom In The World Classification</title>
   <style>
      body {
         font-family: Arial, sans-serif;
         margin: 0;
         padding: 0;
```

```
}
.header {
    background-color: #FF5B2E;
    color: white;
    text-align: center;
    padding: 50px 20px;
}
.header h1 {
    margin: 0;
    font-size: 2.5em;
}
.header p {
    margin: 0;
    font-size: 1.2em;
}
.quote {
    text-align: right;
    margin-right: 20px;
    font-size: 0.9em;
    font-style: italic;
}
.content {
    padding: 20px;
}
.content h2 {
    font-size: 1.5em;
    margin-bottom: 10px;
}
.content p {
    font-size: 1em;
    line-height: 1.5;
}
.chart {
    display: flex;
    justify-content: center;
    align-items: center;
    height: 200px;
}
.chart div {
    background-color: #FF5B2E;
```

```
            width: 50px;
            margin: 0 10px;
        }
        .chart .bar1 {
            height: 50px;
        }
        .chart .bar2 {
            height: 100px;
        }
        .chart .bar3 {
            height: 150px;
        }
        .chart .bar4 {
            height: 200px;
        }
    </style>
</head>
<body>

<a href="predict.html" >Predict</a>


    </div>
    <div class="header">
        <div class="quote">"Freedom is the right to protest for right"-MARTIN
LUTHER KING</div>
        <h1>Freedom In The World Classification</h1>
        <p>Insights Into The State Of Political and Civil Liberties Around The
World.</p>
    </div>
    <div class="content">
        <h2>About The Project</h2>
        <p>
            Based on the Freedom in the World dataset, my report utilized Python to
conduct exploratory data analysis (EDA)
            and applied machine learning techniques such as KNN, SVM, and Naive
Bayes to predict whether a country is classified
            as Free (F) Partly Free (PF), or Not Free (NF). A Flask app was developed
to allow the company to make predictions on
```

a web page. The project demonstrates a deep understanding of machine learning techniques and their application to
real-world problems, while also highlighting the potential for technology to be used to promote social justice and
human rights. Overall, the app has the potential to provide valuable insights into the state of political and civil
liberties around the world.
</p>

</body>
</html>

PREDICT.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Prediction Form</title>
    <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css">
    <style>
        body {
            padding: 20px;
            font-family: Arial, sans-serif;
        }
        .container {
            max-width: 600px;
            margin: 0 auto;
        }
        h1 {
```

```
            font-size: 2em;
            margin-bottom: 20px;
        }
        .form-group label {
            font-size: 1.2em;
        }
    </style>
</head>
<body>
    <div class="container">
        <button class="btn btn-primary" onclick="predict()">Click to
Predict</button>
        <h1>Enter the values</h1>
        <form id="prediction-form">
            <div class="form-group">
                <label for="pr-rating">PR Rating:</label>
                <input type="number" class="form-control" id="pr-rating" name="pr-
rating" required>
            </div>
            <div class="form-group">
                <label for="cl-rating">CL Rating:</label>
                <input type="number" class="form-control" id="cl-rating" name="cl-
rating" required>
            </div>
            <div class="form-group">
                <label for="pr-score">PR Score:</label>
                <input type="number" class="form-control" id="pr-score" name="pr-
score" required>
            </div>
            <div class="form-group">
                <label for="cl-score">CL Score:</label>
                <input type="number" class="form-control" id="cl-score" name="cl-
score" required>
            </div>
            <button type="submit" class="btn btn-primary">Predict</button>
        </form>
    </div>

    <script>
        function predict() {
```

```
            // Placeholder function for predict button
            alert("Predict button clicked");
        }

        document.getElementById('prediction-form').addEventListener('submit',
function(event) {
            event.preventDefault();
            // Add your form submission logic here
            alert("Form submitted");
        });
    </script>
</body>
</html>
```

RESULT.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Freedom In The World Prediction</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            margin: 0;
            padding: 0;
        }
        .header {
            background-color: #FF5B2E;
            color: white;
            text-align: center;
            padding: 50px 20px;
        }
        .header h1 {
            margin: 0;
            font-size: 2.5em;
        }
        .header p {
            margin: 0;
```

```
            font-size: 1.2em;
        }
        .quote {
            text-align: right;
            margin-right: 20px;
            font-size: 0.9em;
            font-style: italic;
        }
        .content {
            padding: 20px;
            text-align: center;
        }
        .content h2 {
            font-size: 1.5em;
            margin-bottom: 10px;
        }
        .content p {
            font-size: 1.2em;
            line-height: 1.5;
        }
        .content .score {
            font-size: 1.2em;
            margin-top: 20px;
            font-weight: bold;
        }
        .back-link {
            margin-top: 20px;
            display: inline-block;
            font-size: 1em;
            color: #007bff;
            text-decoration: none;
        }
        .back-link:hover {
            text-decoration: underline;
        }
    </style>
</head>
<body>
    <div class="header">
```

```
    <div class="quote">"Freedom is the right to protest for right"-MARTIN
LUTHER KING</div>
    <h1>Freedom In The World Prediction</h1>
    <p>Insights Into The State Of Political and Civil Liberties Around The
World.</p>
  </div>
  <div class="content">
    <p class="score">TOTAL SCORE: 14</p>
    <h2>Freedom in the World Result</h2>
    <p>Country Classification: NF</p>
    <a href="index.html" class="back-link">Back to Home</a>
  </div>
</body>
</html>
```

APP.PY

```
from flask import Flask, render_template, request
import joblib
app = Flask(__name__)
model = joblib.load('model (3).pkl')
@app.route('/')
def index():
   return render_template('index.html')
@app.route('/input')
def input_page():
   return render_template('input.html')
@app.route('/predict', methods=['POST'])
def predict():
   pr_rating = request.form['pr_rating']
   cl_rating = request.form['cl_rating']
   total_score = int(request.form['pr_score']) + int(request.form['cl_score'])
```

```
        if (pr_rating == '2' or cl_rating == '2') and (70 <= total_score <= 72):
            prediction = 'F'
        elif (pr_rating == '3' and cl_rating == '3') and (70 <= total_score <= 72):
            prediction = 'PF'
        elif (pr_rating == '5' and cl_rating == '5') and (29 <= total_score <= 36):
            prediction = 'PF'
        elif (pr_rating == '6' and cl_rating == '5') and (29 <= total_score <= 36):
            prediction = 'NF'
        elif (pr_rating == '5' and cl_rating == '6') and (29 <= total_score <= 36):
            prediction = 'NF'
        elif total_score > 72:
            prediction = 'F'
        elif total_score < 29:
            prediction = 'NF'
        elif 29 <= total_score <= 72:
            X = [[int(pr_rating), int(cl_rating), int(request.form['pr_score']),
    int(request.form['cl_score']), total_score]]
            prediction = model.predict(X)[0]
        else:
            prediction = 'Unknown'

        return render_template('predict.html', prediction=prediction,
    total_score=total_score)

    if __name__ == "__main__":
app.run(debug=False)
```

CODE SNIPPETS

MODEL BUILDING

```python
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
import seaborn as sns
```

Python

```python
data=pd.read_csv('/content/Freedom in the World 2013-2022 Dataset (Ver 2.18.23).csv')
```

Python

```python
data.head()
```

Python

```python
data.tail()
```

Python

```python
data.isnull().sum()
```

Python

```
Country/Territory    0
Region               0
C/T                  0
Edition              0
Status               0
PR rating            0
CL rating            0
A1                   0
A2                   0
A3                   0
A                    0
B1                   0
B2                   0
B3                   0
B4                   0
B                    0
C1                   0
C2                   0
C3                   0
```

```
 11  B1              2095 non-null   int64
 12  B2              2095 non-null   int64
 13  B3              2095 non-null   int64
 14  B4              2095 non-null   int64
 15  B               2095 non-null   int64
 16  C1              2095 non-null   int64
 17  C2              2095 non-null   int64
 18  C3              2095 non-null   int64
 19  C               2095 non-null   int64
...
 40  CL              2095 non-null   int64
 41  Total           2095 non-null   int64
dtypes: int64(38), object(4)
memory usage: 687.5+ KB
```

Output is truncated. View as a scrollable element or open in a text editor. Adjust cell output settings...

checking missing values

```
data
```

Python

```
sns.boxplot(data=data)
```

Python

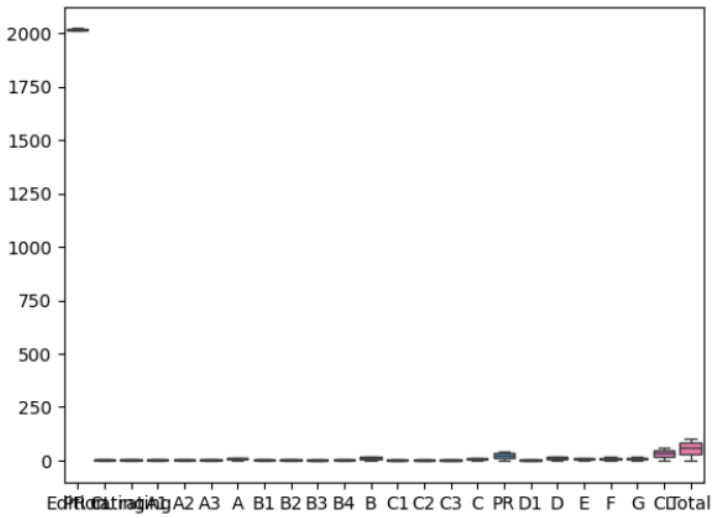
```
<Axes: >
```

```
C                0
PR               0
D1               0
D2               0
D3               0
D4               0
...
G4               0
G                0
CL               0
Total            0
dtype: int64
```

Output is truncated. View as a scrollable element or open in a text editor. Adjust cell output settings...

```
data.drop(['D2','D3','D4','E1','E2','E3','F1','F2','F3','F4','G1','G2','G3','G4'], axis=1, inplace=True)
```

Python



```
###Exploring visual data analysis

#Descriptive analysis

data.describe()
```
Python

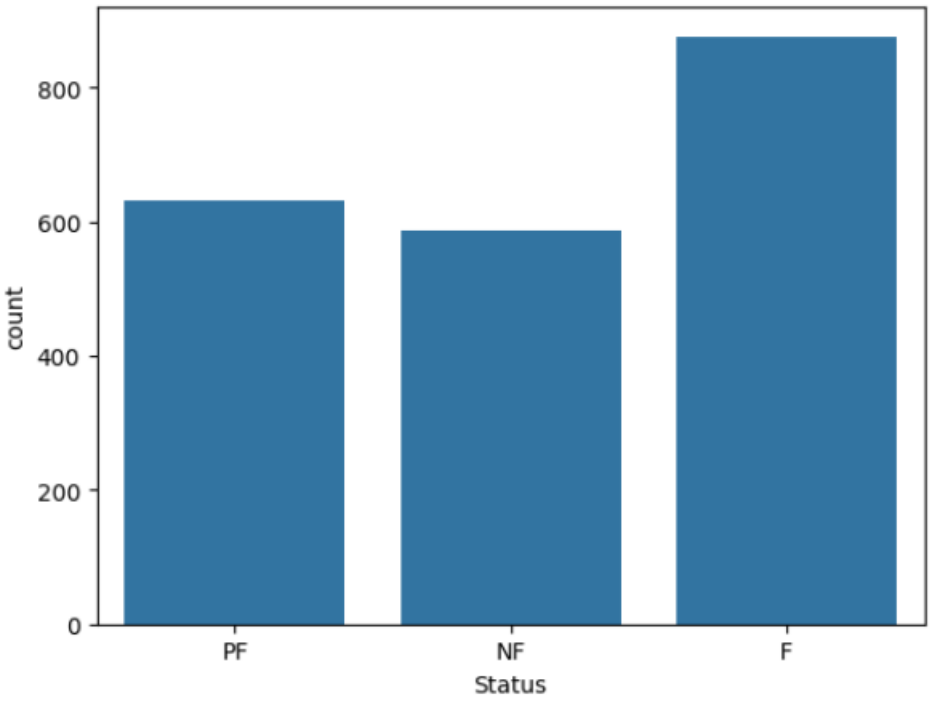
```
...
```

```
###visual analysis

Univariate analysis

sns.countplot(data=data,x='Status')
```
Python

```
...  <Axes: xlabel='Status', ylabel='count'>
```

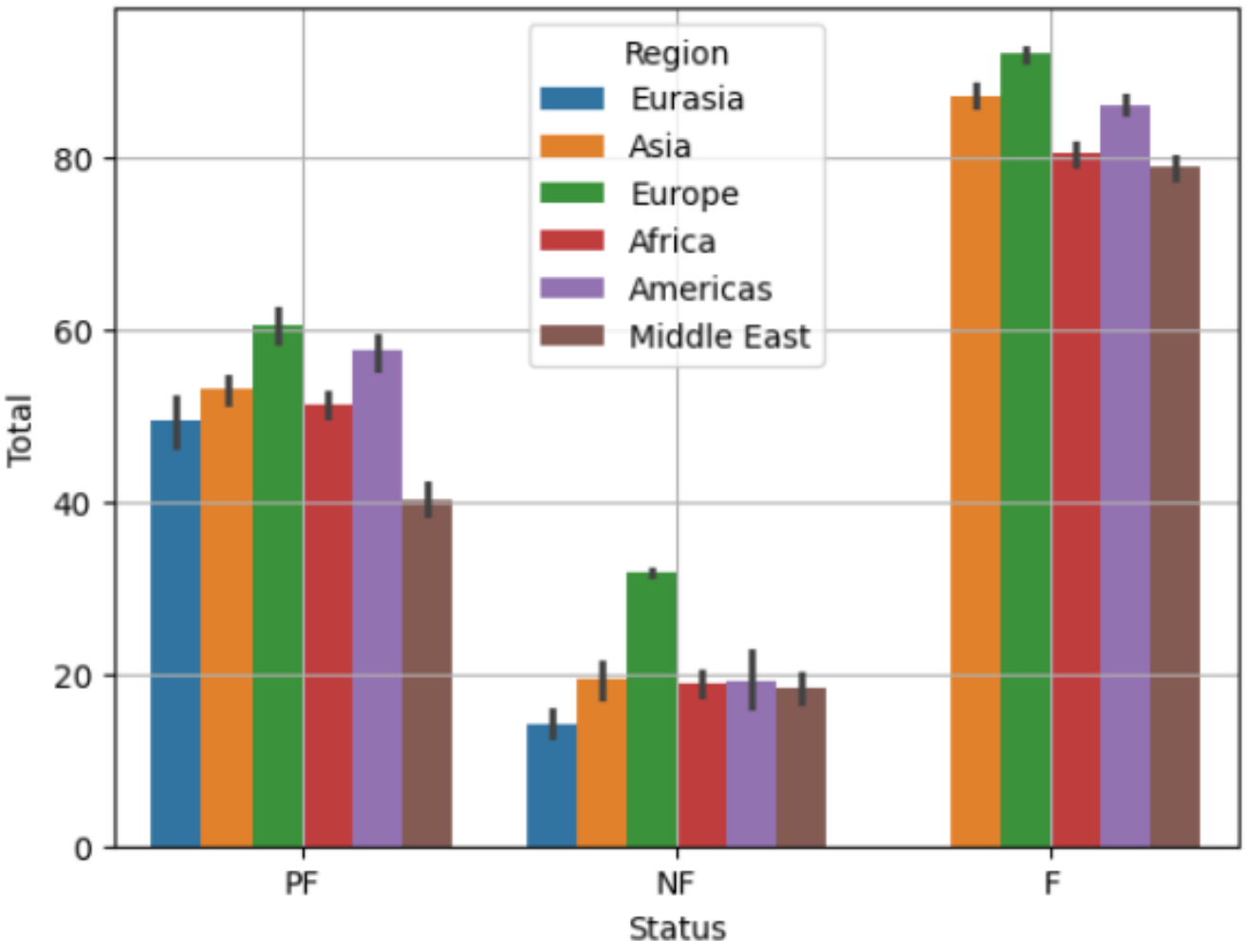


```python
import seaborn as sns
import matplotlib.pyplot as plt

sns.barplot(data=data, x='Status',y='Total', hue='Region')
plt.grid(True)
plt.show()
```

Python

PAIRPLOT



###Multivariate Analysis

+ Code + Markdown

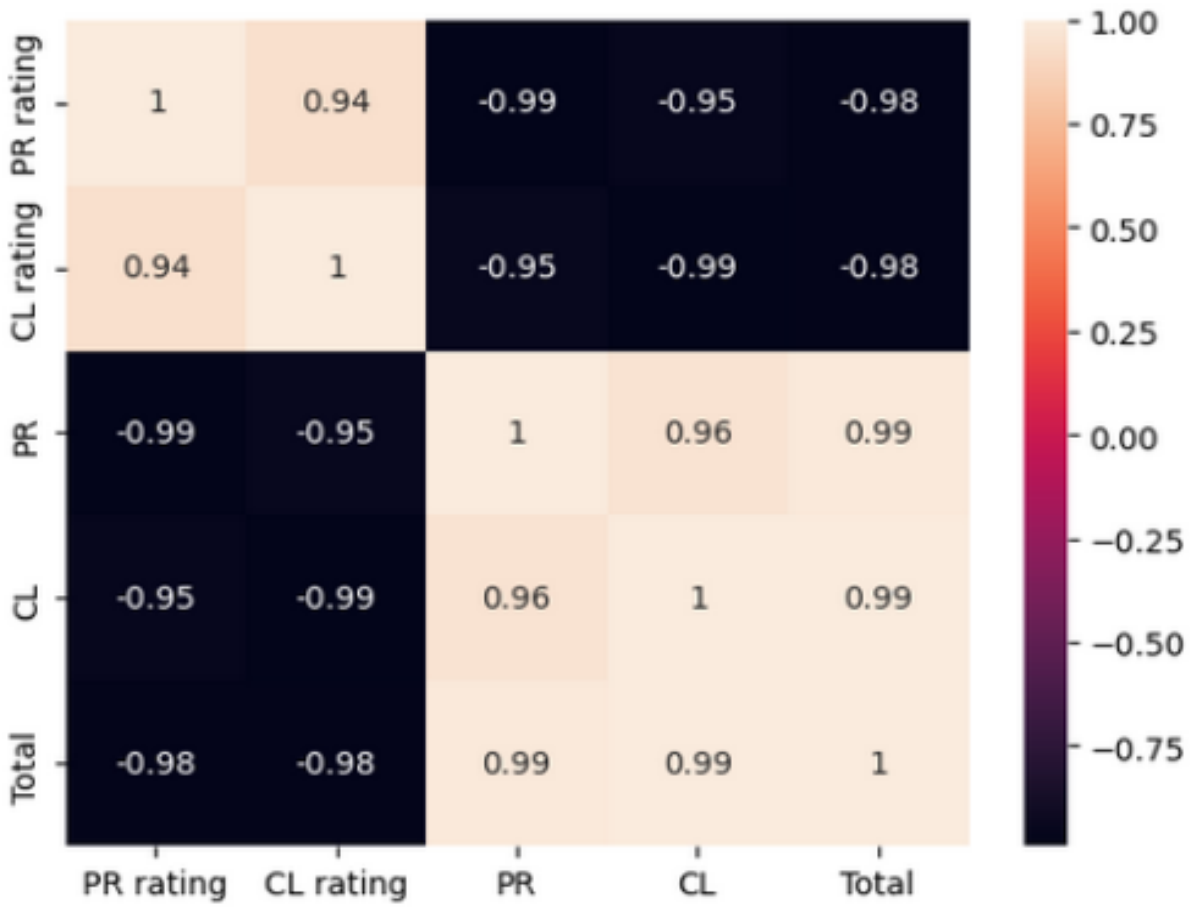
```python
import seaborn as sns
import matplotlib.pyplot as plt
import pandas as pd # Import pandas for data manipulation

# Assuming 'Country/Territory' is the column with non-numerical values
numerical_data = data.select_dtypes(include=['number']) # Select only numerical columns

sns.heatmap(numerical_data.corr(), annot=True)
plt.show()
```

Python

HEAT MAP



#trainng and splitting of data

```
from sklearn.model_selection import train_test_split
train_data, test_data = train_test_split(data, test_size=0.2, random_state=42)
train_data.to_csv('train_data.csv', index=False)
test_data.to_csv('test_data.csv', index=False)
```

Python

```
features=['PR rating','CL rating','PR','CL','Total']
target=['Status']
```

Python

```python
x_train=train_data[features]
y_train=train_data[target]
print(x_train)
print(y_train)
```

Python

```
      PR rating  CL rating  PR  CL  Total
30            7          5   5  19     24
1178          4          4  21  28     49
1628          1          1  37  53     90
764           2          2  31  50     81
1317          3          3  27  35     62
...         ...        ...  ..  ..    ...
1638          5          5  16  25     41
1095          1          1  38  56     94
1130          6          6   7  10     17
1294          3          4  29  34     63
860           3          3  28  39     67
```

```
[1676 rows x 5 columns]
     Status
30       NF
1178     PF
1628      F
764       F
1317     PF
...     ...
1638     PF
1095      F
1130     NF
1294     PF
860      PF

[1676 rows x 1 columns]
```

```python
x_test=test_data[features]
y_test=test_data[target]
print(x_test)
print(y_test)
```

Python

```
      PR rating  CL rating  PR  CL  Total
210           5          5  17  23     40
1169          4          4  20  33     53
1146          5          4  14  30     44
879           7          6   4  13     17
29            1          1  38  54     92
...         ...        ...  ..  ..    ...
1941          7          7   1   2      3
1337          4          4  22  29     51
2083          1          1  40  57     97
393           7          5   5  25     30
1554          2          3  34  40     74

[419 rows x 5 columns]
     Status
210      PF
1169     PF
1146     PF
879      NF
29        F
...     ...
1941     NF
1337     PF
2083      F
393      NF
1554      F
```

```
[419 rows x 1 columns]
```

+ Code + Markdown

```
from sklearn.neighbors import KNeighborsClassifier
knn=KNeighborsClassifier(n_neighbors=5, metric='minkowski',p=2)
knn.fit(x_train,y_train)
```

Python

```
/usr/local/lib/python3.10/dist-packages/sklearn/neighbors/_classification.py:215: DataConversionWarning: A column-vector y was passed when a 1d array was expected. Please change the sha
  return self._fit(X, y)
```

```
y_pred=knn.predict(x_test)
y_pred
```

Python

```
array(['PF', 'PF', 'PF', 'NF', 'F', 'NF', 'F', 'NF', 'F', 'PF', 'PF',
       'PF', 'NF', 'NF', 'PF', 'F', 'F', 'PF', 'F', 'F', 'F', 'F', 'NF',
       'PF', 'PF', 'PF', 'F', 'NF', 'F', 'PF', 'F', 'NF', 'F', 'F', 'F',
       'PF', 'F', 'F', 'PF', 'F', 'NF', 'PF', 'F', 'F', 'PF', 'NF', 'NF',
       'NF', 'F', 'NF', 'F', 'NF', 'F', 'NF', 'NF', 'NF', 'PF', 'F', 'F',
       'F', 'F', 'PF', 'F', 'NF', 'F', 'F', 'F', 'F', 'F', 'F', 'NF',
       'NF', 'NF', 'F', 'F', 'PF', 'F', 'F', 'NF', 'PF', 'F', 'F', 'F',
       'NF', 'PF', 'F', 'NF', 'F', 'PF', 'PF', 'NF', 'PF', 'F', 'PF',
       'NF', 'PF', 'F', 'NF', 'PF', 'F', 'F', 'F', 'F', 'PF', 'PF', 'NF',
       'F', 'NF', 'PF', 'F', 'PF', 'F', 'F', 'PF', 'PF', 'PF', 'F', 'PF',
       'PF', 'F', 'NF', 'F', 'F', 'F', 'F', 'PF', 'PF', 'F', 'F', 'PF',
       'NF', 'NF', 'PF', 'F', 'F', 'NF', 'F', 'NF', 'F', 'PF', 'PF', 'NF',
       'F', 'PF', 'F', 'NF', 'F', 'PF', 'F', 'PF', 'F', 'PF', 'NF', 'F',
       'NF', 'PF', 'NF', 'NF', 'F', 'PF', 'PF', 'PF', 'F', 'NF', 'F', 'F',
       'PF', 'F', 'PF', 'F', 'PF', 'PF', 'F', 'F', 'F', 'NF', 'F', 'F',
       'NF', 'NF', 'F', 'F', 'PF', 'F', 'PF', 'F', 'PF', 'PF', 'F', 'NF',
       'F', 'NF', 'PF', 'NF', 'NF', 'NF', 'PF', 'F', 'NF', 'NF', 'F', 'F',
       'NF', 'NF', 'PF', 'PF', 'PF', 'NF', 'PF', 'PF', 'PF', 'F', 'F',
       'PF', 'NF', 'F', 'PF', 'NF', 'NF', 'F', 'F', 'F', 'PF', 'F', 'F',
       'NF', 'PF', 'PF', 'PF', 'NF', 'NF', 'F', 'F', 'F', 'PF', 'PF', 'F',
       'PF', 'F', 'PF', 'PF', 'NF', 'PF', 'F', 'F', 'PF', 'F', 'F', 'F',
       'NF', 'PF', 'NF', 'PF', 'F', 'NF', 'NF', 'PF', 'F', 'PF', 'PF',
       'F', 'F', 'F', 'PF', 'F', 'NF', 'F', 'F', 'F', 'PF', 'NF', 'PF',
       'PF', 'F', 'PF', 'PF', 'PF', 'F', 'F', 'PF', 'NF', 'F', 'NF', 'F',
       'PF', 'NF', 'PF', 'F', 'F', 'F', 'F', 'PF', 'F', 'NF', 'NF', 'F',
...
       'NF', 'PF', 'NF', 'F', 'PF', 'NF', 'PF', 'PF', 'F', 'PF', 'PF',
       'F', 'F', 'F', 'F', 'F', 'F', 'PF', 'F', 'NF', 'NF', 'F', 'F',
       'PF', 'NF', 'F', 'NF', 'PF', 'F', 'NF', 'NF', 'F', 'F', 'NF', 'PF',
       'F', 'NF', 'NF', 'PF', 'NF', 'PF', 'PF', 'NF', 'NF', 'NF', 'PF',
       'NF', 'NF', 'PF', 'F', 'NF', 'F'], dtype=object)
```

Output is truncated. View as a scrollable element or open in a text editor. Adjust cell output settings...

```
from sklearn.metrics import accuracy_score

# Predict the labels for the training set
y_pred = knn.predict(x_train)

# Calculate the accuracy
accuracy = accuracy_score(y_train, y_pred)
print(f"Accuracy: {accuracy*100}")
```

Python

```
Accuracy: 99.7016706443914
```

```
import joblib
joblib.dump(knn,'model.pkl')
```

Python

```
['model.pkl']
```

DESCRIPTIVE ANALYSIS

	PR rating	CL rating	PR	CL	Total
count	2095.000000	2095.000000	2095.000000	2095.000000	2095.000000
mean	3.575656	3.458234	22.848687	34.949403	57.798091
std	2.211561	1.932492	13.464039	17.126707	30.288533
min	1.000000	1.000000	-3.000000	1.000000	-1.000000
25%	1.000000	2.000000	10.000000	20.500000	30.000000
50%	3.000000	3.000000	26.000000	36.000000	62.000000
75%	6.000000	5.000000	36.000000	51.000000	87.000000
max	7.000000	7.000000	40.000000	60.000000	100.000000