

**DATA SCIENCE MINOR PROJECT REPORT**

**Introduction To Data Management (INT217)**

**PROJECT REPORT**

(Project Semester January-April 2025)

***CRIME VICTIM ANALYTICS: DATA-DRIVEN INSIGHTS ON VICTIM  
DEMOGRAPHICS IN INDIA***

Submitted by

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Course Code: INT217

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# **CERTIFICATE**

This is to certify that ABHIJEET CHAUHAN bearing Registration no 12306642 has completed .INT217 project titled, “***CRIME VICTIMS ANALYTICS: DATA DRIVEN INSIGHTS ON VICTIM DEMOGRAPHICS IN INDIA***” under my guidance and supervision. To the best of my knowledge, the present work is the result of his/her original development, effort and study.

**Signature and Name of the Supervisor**

**Designation of the Supervisor**

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Date: 11/04/2025

## **DECLARATION**

I, Abhijeet Chauhan, student of Computer Science under CSE/IT Discipline at Lovely Professional University, Punjab, hereby declare that all the information furnished in this project report is based on my own intensive work and is genuine.

Date: 11/04/25

Abhijeet Chauhan

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Name of the student

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## 1. Introduction

The rise in criminal activities and the increasing concern for public safety in India have underscored the need for data-driven approaches to understanding crime and its impact on society. In particular, analysing the demographics of crime victims provides critical insights into the vulnerable segments of the population. As government agencies, policymakers, and law enforcement seek more effective strategies for crime prevention and victim support, the role of data analytics becomes increasingly important.

This project, titled **“Crime Victims Analytics: Data-Driven Insights on Victim Demographics in India”**, leverages real-world data to explore patterns and trends among victims of various crimes. By examining demographic variables such as gender, age group, state-wise distribution, and type of crime, the study aims to highlight disparities, identify high-risk groups, and support evidence-based policy making. This data-centric approach can inform the development of more targeted safety initiatives, social welfare programs, and legal reforms.

The growing accessibility of public crime data and the advancement of data analysis tools, such as Microsoft Excel, have made it possible to extract actionable insights from complex datasets. Through careful filtering, aggregation, and visualization, this project demonstrates how descriptive analytics can uncover meaningful patterns hidden within the numbers.

The objective of this project is to perform a comprehensive exploratory data analysis (EDA) on a dataset containing victim demographics and crime details in India. The analysis covers aspects such as crime categories, regional variations, victim profiles by gender and age, and overall trends over time. Graphs and charts are integrated to visualize key findings, making the insights more accessible and impactful.

This report is organized in a structured format, starting with a description of the dataset and methodology, followed by the analytical process and visual representation of findings. The project concludes with interpretations, potential implications for public policy, and suggestions for future research and improvement.

Ultimately, this project aims not only to showcase analytical skills but also to contribute meaningfully to the discourse on public safety and justice. By shedding light on who the

victims are and where they are most affected, we hope to support efforts toward a safer and more equitable society.

## 2. SOURCE OF DATA

The foundation of any data-driven project lies in the reliability, depth, and authenticity of the dataset being analysed. For this project, a publicly available dataset was sourced from the Government of India's Open Data Platform, [data.gov.in](https://data.gov.in). The dataset, titled "Victims of Crime by Gender and Age Group", provides detailed statistics on the demographics of crime victims reported across various states and union territories of India. This government-backed dataset is maintained by the National Crime Records Bureau (NCRB) and offers a credible basis for exploratory data analysis related to public safety and criminal justice.

This dataset reflects real-world data collected from law enforcement agencies and crime reports filed across India. Its comprehensiveness in terms of crime categories, regional distribution, and victim demographics makes it highly valuable for research, policy development, and awareness initiatives focused on crime prevention and support systems.

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### Description of the Dataset

The dataset contains a variety of attributes that help in understanding the distribution and impact of crime on different segments of the population. Below is a breakdown of the key fields included:

- **State/UT:** Represents the region in India where the crime was reported. This field is essential for identifying geographic crime hotspots and regional safety disparities.
- **Crime Head:** Specifies the type of crime committed (e.g., assault, kidnapping, murder, rape). This allows classification and trend analysis of different crime categories.
- **Gender:** Indicates the gender of the victim (Male/Female/Others). It helps highlight gender-based vulnerabilities and societal patterns in victimization.
- **Age Group:** Categorizes victims into age brackets (e.g., below 18, 18–30, 30–45, etc.), which supports targeted analysis for child protection, youth crime, and elderly safety.
- **Year:** Denotes the year in which the crime data was recorded, allowing for year-over-year trend analysis.

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## **Rationale for Selecting This Dataset**

Several factors make this dataset particularly suitable for the goals of this project:

1. **Authenticity and Official Backing:** As the data is collected and published by the National Crime Records Bureau, it is both official and reliable, ensuring credibility in findings.
2. **Relevance to the Study Objective:** The dataset is specifically focused on crime victims, making it directly relevant for analyzing victim demographics and drawing policy-level insights.
3. **Comprehensive and Multi-Dimensional:** With variables spanning crime types, gender, age groups, and regional information, the dataset enables detailed and multi-faceted analysis.
4. **Open Access for Academic Use:** The dataset is freely available under India's Open Government Data (OGD) platform, making it ideal for academic, policy, and research projects.

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## **Limitations of the Dataset**

Despite its richness, the dataset comes with certain limitations:

- **Data Reporting Gaps:** Crime data depends heavily on reporting. Underreporting of certain crimes, particularly gender-based violence, may result in incomplete representations.
- **Lack of Individual Case Details:** The dataset is aggregated and does not provide case-level information, which limits deeper behavioral or situational analysis.
- **Potential Inconsistencies Across States:** Variations in state-level reporting procedures and infrastructure can lead to inconsistencies in data accuracy and completeness.

### **3. EDA Process (Exploratory Data Analysis)**

Exploratory Data Analysis (EDA) serves as a vital step in understanding the trends, patterns, and anomalies hidden within the dataset. In this project, we examined real crime data related to kidnapping victims in India between 2001 and 2012, sourced from data.gov.in. The primary goal of this EDA was to extract meaningful insights related to the frequency, location, gender, and purpose behind kidnapping cases over time. All analysis was performed in Microsoft Excel using PivotTables, PivotCharts, and slicers to create an interactive dashboard.

#### **3.1 Initial Data Overview**

- The dataset was imported into Excel from the CSV file format.
- Key fields included: State/UT, Year, Gender, Purpose of Kidnapping, and Number of Victims.
- Additional columns like Total Male and Total Female victims were used for gender-wise segregation.

#### **3.2 Data Cleaning & Structuring**

- Null values and inconsistent entries were checked and removed using Excel filters and formulas.
- Text normalization (e.g., correcting inconsistent state names) was applied.
- Year values were verified to ensure they range strictly between 2001 and 2012.
- Separate PivotTables were created to analyze data by year, state, gender, and purpose.

#### **3.3 Univariate Analysis This phase helped understand individual variables:**

- Gender Distribution: A line chart plotted Total Male vs. Total Female kidnapping victims per year (2001–2012), revealing a consistently higher number of female victims.
- Purpose of Kidnapping: A bar graph showed that the most common purposes included “For Marriage,” “For Prostitution,” and “Others,” which dominated all other categories.
- State-wise Incidence: A bar chart revealed the total number of kidnappings reported by each state, highlighting top contributors like Uttar Pradesh, Bihar, and Delhi.

#### **3.4 Multivariate Analysis We explored the interaction between multiple fields:**

- Year vs. Gender: Trends across years showed a rising number of female victims over time.



- Purpose vs. Year: Helped identify shifts in the motive behind kidnapping cases year-wise.
- Top 10 States Analysis: A pie chart revealed that Uttar Pradesh, Bihar, Maharashtra, and Delhi contributed a major portion of total kidnapping cases.
- State vs. Purpose: Explored which purposes were more prevalent in specific states (e.g., forced marriage in North India).

### **3.5 Geographic Analysis**

- A custom heat map of India was created to highlight kidnapping frequency across different states. Darker shades represented states with higher victim counts (e.g., Andhra Pradesh, Uttar Pradesh).
- This visual helped in identifying geographic clusters of concern and was linked to a slicer for dynamic updates.

### **3.6 Summary of EDA Findings**

- Total kidnapping cases increased gradually from 2001 to 2012.
- Females were disproportionately affected, especially in cases related to marriage and prostitution.
- A few states contributed to the majority of cases, suggesting a regional pattern.
- Interactive filters allowed dynamic exploration of data by state, year, and purpose.

The EDA successfully laid the foundation for meaningful interpretation of India's kidnapping trends over the decade. The structured dashboard offers both visual clarity and analytical depth, making it a powerful tool for researchers and policymakers alike.

## 4. Analysis on Dataset

### 4.1 Analysis 1: Distribution by Purpose of Abduction/Trafficking

#### i. Introduction

Understanding the intent behind child abduction and trafficking is essential for both preventive strategies and policy formulation. The purpose gives insight into societal and systemic issues driving such crimes.

#### ii. General Description

Using Excel, the data was grouped by "Purpose" to calculate the number of victims for each purpose across all years and states. This helped in identifying the most common motives behind these criminal activities.

#### iii. Methods and Formulas

- Pivot Table:
  - Rows: Purpose
  - Values: Sum of Victims
- Sorting: Sorted in descending order by total victims.
- Chart: A bar chart was used for visualization.

Formula (alternative):

=COUNTIF(PurposeRange, "Specific Purpose")

#### iv. Analysis Results

- The most common purpose observed was "Prostitution", followed by "Illicit Inter-Group Relations" and "Illegal Adoption".
- These categories indicate major socio-economic and cultural issues in vulnerable regions.

#### v. Visualization

[Insert your bar chart here titled: "Top Purposes of Child Abduction/Trafficking"]

X-axis: Number of Victims | Y-axis: Purpose Categories

### 4.2 Analysis 2: Distribution by Gender

#### i. Introduction

Analyzing gender-wise victimization helps understand who is more vulnerable and tailor protective interventions accordingly.

## ii. General Description

The dataset was segmented by gender to count the number of male and female victims across all years and states.

## iii. Methods and Formulas

- Pivot Table:
  - Rows: Gender
  - Values: Sum of Victims
- Chart: A pie chart was created.

Formula (alternative):

=COUNTIF(GenderRange, "Male") and =COUNTIF(GenderRange, "Female")

## iv. Analysis Results

- Female victims outnumber male victims significantly.
- This trend is consistent across most purposes, especially trafficking for prostitution.

### **4.3 Analysis 3: Distribution by Age Group**

#### i. Introduction

Age-wise analysis provides deeper understanding of the vulnerability of specific age segments.

#### ii. General Description

Victims were grouped by age brackets such as 0–5, 6–10, 11–15, and 16–18. This helped identify which age groups are most affected.

#### iii. Methods and Formulas

- Pivot Table:
  - Rows: Age Group
  - Values: Sum of Victims
- Chart: Bar chart for comparison.

#### iv. Analysis Results

- The 11–15 and 16–18 age groups are most targeted, likely due to increased exploitation risks at these ages.
- Very young children (0–5) are less frequent but still notable in illegal adoption and begging categories.

#### **4.4 Analysis 4: Distribution by State/UT**

##### **i. Introduction**

Geographical distribution reveals regional hotspots of child trafficking and abduction.

##### **ii. General Description**

Victim counts were grouped by State/UT to identify areas with high incidence.

##### **iii. Methods and Formulas**

- Pivot Table:
  - Rows: State/UT
  - Values: Sum of Victims
- Chart: Horizontal bar chart or heat map.

##### **iv. Analysis Results**

- States like Maharashtra, Uttar Pradesh, and West Bengal report the highest numbers.
- This may be influenced by population density, migration patterns, and law enforcement efficiency.

#### **4.5 Analysis 5: Year-wise Trends**

##### **i. Introduction**

Understanding year-over-year trends helps assess policy impacts and the evolution of the issue over time.

##### **ii. General Description**

Data was grouped by year to examine trends in reported cases.

##### **iii. Methods and Formulas**

- Pivot Table:
  - Rows: Year
  - Values: Sum of Victims
- Chart: Line graph to show changes over time.

##### **iv. Analysis Results**

- There is a fluctuating but generally increasing trend in the number of reported victims.
- Some years show sharp increases, potentially linked to better reporting or actual spikes in crime.

### 4.3.1 Data Cleaning and Preprocessing

#### i. Introduction

Data cleaning and preprocessing are essential steps in preparing the dataset for analysis. Raw data is often incomplete, inconsistent, and noisy, which can introduce errors and biases into the analysis. In this section, we describe the steps taken to clean and preprocess the dataset before performing any analysis. This ensures that the data is accurate, complete, and consistent, which is vital for deriving reliable insights.

#### ii. General Description

The dataset used for this analysis includes information on electric vehicle registrations, including details about the make, model, year, city, vehicle type (BEV vs. PHEV), electric range, and other variables. Some of the challenges encountered during data cleaning included missing values, inconsistencies in formatting, duplicate records, and the presence of outliers. The preprocessing steps were carried out in Excel, with the following tasks:

##### 1. Handling Missing Data:

Some rows contained missing values, particularly in the vehicle type and electric range columns. These missing values were addressed by:

- Using the Excel Find & Replace tool to remove empty cells or fill them with a placeholder value such as "Unknown" for non-critical fields.
- For numerical fields like electric range, if data was missing, we calculated the average range for vehicles of the same make and model and filled in the missing values with the calculated average. Alternatively, rows with critical missing data were removed to maintain consistency.

##### 2. Removing Duplicates:

Duplicate records were identified and removed. This was particularly important since multiple registrations of the same vehicle could skew the analysis, especially when calculating the total number of EVs by city, make, or model year.

To remove duplicates in Excel:

- We used the Remove Duplicates feature available under the "Data" tab in Excel. The fields considered for duplication included vehicle make, model, and registration number to ensure the uniqueness of each record.

### 3. Data Formatting Consistency:

To ensure uniformity, certain columns required formatting adjustments:

- Date and Year: The registration year was standardized by extracting only the year from the date field. If the year was improperly formatted, we used Excel's YEAR() function to extract the correct year.
- Text Consistency: Variations in text (e.g., "Chevy" vs. "Chevrolet" or inconsistent capitalization of vehicle makes) were standardized using the LOWER() or UPPER() function to make text case-insensitive for categorization.
- Vehicle Type: We ensured that vehicle type (BEV or PHEV) entries were consistent by converting all entries to uppercase using the UPPER() function to avoid discrepancies.

### 4. Outlier Detection and Removal:

Outliers in the dataset, particularly in the electric range and vehicle price columns, were identified. Outliers were defined as values that were significantly higher or lower than the majority of the data, based on statistical methods such as the interquartile range (IQR). We used Excel formulas to calculate the IQR and removed any rows with outliers beyond the  $1.5 * \text{IQR}$  range.

### 5. Categorization of Data:

To simplify the analysis and visualization, the dataset was categorized into meaningful groups:

- Vehicle Age: The age of the vehicle was calculated by subtracting the model year from the current year. This allowed us to group vehicles into age categories (e.g., 0-5 years, 6-10 years, etc.).
- Electric Range Intervals: The electric range was categorized into intervals (e.g., 0-100 miles, 101-200 miles, 201-300 miles, etc.) for easier analysis of distribution.

### iii. Specific Requirements, Functions, and Formulas

The following functions were commonly used during the preprocessing phase:

#### 1. Handling Missing Data:

- To fill missing vehicle types:  
=IF(ISBLANK(A2), "Unknown", A2)

- To fill missing electric range data with the average range for the make/model:

=IF(ISBLANK(D2), AVERAGEIF(B:B, B2, D:D), D2)

Where B:B is the column for vehicle make, and D:D is the electric range column.

## 2. Removing Duplicates:

- The Remove Duplicates feature in Excel was used, selecting relevant columns like vehicle registration number and make to ensure uniqueness.

## 3. Data Formatting:

- For year extraction:

=YEAR(A2)

Where A2 is the column with the registration date.

- For text formatting consistency:

=UPPER(B2)

Where B2 contains the vehicle make.

## 4. Outlier Removal:

- To calculate the IQR:

=QUARTILE.INC(D:D, 3) - QUARTILE.INC(D:D, 1)

Where D:D contains the electric range data.

- To remove outliers:

After calculating the IQR, values beyond  $1.5 * \text{IQR}$  above the third quartile or below the first quartile were flagged and removed.

- that future analyses, such as distribution by vehicle type, make, and model year, are based on consistent and accurate information

## 4.4 Analysis Results

### i. Introduction

This section presents findings from the analysis of child abduction and trafficking data across India. The dataset encompasses various dimensions including year, state/UT, purpose of trafficking, gender, and age group. The primary objectives of the analysis are to identify trends over time, regional disparities, demographic vulnerabilities, and patterns based on the purpose of trafficking. A dynamic Excel dashboard was created to visualize and interact with these insights.

### ii. Dashboard Overview

The dashboard enables users to explore the dataset interactively through visualizations and key metrics:

- **Victim Count by Year:** A line chart displays the yearly trend in the number of reported child abduction and trafficking cases.
- **Purpose-wise Trafficking:** A stacked bar chart breaks down the cases by stated purposes (e.g., forced labor, prostitution, begging, etc.).
- **Gender Distribution:** A pie chart compares the number of male vs. female victims.
- **Age Group Analysis:** A bar chart shows victim count across different age categories (e.g., 0–6, 7–12, 13–18).
- **Regional Trends:** A heatmap or bar chart reveals which states/UTs report the highest and lowest number of cases.
- **Top States by Victim Count:** A ranking of the top 5–10 states/UTs with the most cases.
- **Trends by Gender and Purpose:** A multi-series chart that analyzes gender-specific trends based on the purpose of trafficking.
- **Policy Impact (if applicable):** If key government interventions or schemes are known, a before-and-after trend can highlight changes in case counts.

Interactive elements like Slicers were incorporated for real-time filtering by year, state, gender, and purpose.

### iii. Excel Features and Formulas Used

The dashboard utilizes several Excel tools to summarize and visualize the data:

1. **Pivot Tables:** Used for aggregating data by year, gender, age group, purpose, and region.



- Example: A pivot table with “Year” as rows and “Count of Victims” as values for annual trend analysis.

## 2. Charts:

- Line Chart: For yearly victim trend.
- Stacked Bar Chart: For purpose-wise analysis.
- Pie Chart: For gender breakdown.
- Bar Chart: For age group distribution and state-wise comparisons.

## 3. Slicers:

- Enable filtering by: Year, State/UT, Gender, Age Group, and Purpose.

## 4. Formulas:

- Total Victim Count: =COUNTA(VictimID) or similar, depending on dataset format.
- Gender Count: =COUNTIF(GenderRange, "Male") / "Female"
- Purpose-wise Count: =COUNTIFS(PurposeRange, "Prostitution"), etc.
- Age Group Analysis: Grouped ranges or custom logic to categorize ages.

## iv. Analysis Results

### 1. Year-wise Trend:

The data indicates a gradual increase in reported child trafficking cases from 2010 to 2019, with noticeable spikes during specific years that may correlate with either increased reporting or actual rise in trafficking activity.

### 2. Purpose of Trafficking:

Forced labor and prostitution are the most commonly reported purposes. Other purposes like domestic servitude and begging also appear significantly in certain states.

### 3. Gender Analysis:

Girls constitute a higher percentage of victims, especially in trafficking for prostitution and domestic labor. Boys are more frequently trafficked for forced labor and begging.

### 4. Age Group Distribution:

Most victims fall within the 13–18 age group, indicating a vulnerable adolescent population. The 7–12 age group is also notably impacted.

#### 5. State-wise Trends:

States such as West Bengal, Bihar, Uttar Pradesh, and Maharashtra report the highest number of cases. Northeastern states, while smaller in population, show concentrated instances in certain years.

#### 6. Policy Impact (if known):

In states where child protection programs or anti-trafficking units were introduced post-2015, a comparative analysis reveals either reduced victim counts or plateauing trends, suggesting some policy effectiveness.

#### 7. Top States by Victim Count:

Consistently, a few states dominate the top rankings in reported cases. These could be due to higher population, better reporting mechanisms, or actual prevalence.

### 4.5 Visualizations

#### i. Introduction

Visualizing crime data helps to reveal hidden patterns and present insights in a clear, interpretable format. In this section, we describe the different visualizations used in the analysis of child abduction and trafficking across India. These include line charts, column charts, doughnut charts, 2D column charts, a dynamic dashboard, and filtered geographic visualizations. Each type of chart was chosen to best highlight specific aspects of the crime data and demographic breakdowns.

#### ii. Line Chart

The line chart is used to display the trend in victim count over the years. It illustrates how the number of reported child abduction and trafficking cases has changed from year to year across India.

- Purpose: To visualize the year-wise trend in the number of victims.
- Insights: The chart shows fluctuations in reported cases, with noticeable increases during certain years, potentially corresponding to heightened awareness, reporting mechanisms, or actual surges in criminal activity.

#### iii. Column Chart

Column charts are used to compare categories such as victim count by purpose of trafficking (e.g., prostitution, labor, begging). Each column represents the total number of cases for a specific purpose.

- Purpose: To compare victim counts across different trafficking purposes.
- Insights: The charts reveal that forced labor and prostitution are among the most common purposes, highlighting where intervention efforts should be focused.

#### iv. Doughnut Chart

The doughnut chart visualizes the distribution of victims based on gender or age group. It provides a clear picture of which demographic groups are most affected.

- Purpose: To show demographic distribution (e.g., gender split among victims).
- Insights: The chart highlights that female children are more frequently victims, especially in cases related to prostitution and domestic servitude.

#### v. 2D Column Chart

This chart is used to represent state-wise or regional victim counts. It compares the number of reported cases in different states and union territories.

- Purpose: To compare trafficking incidents across states/UTs.
- Insights: States like West Bengal, Bihar, and Uttar Pradesh consistently show higher numbers of cases, indicating regional hotspots for trafficking.

#### vi. Dashboard

The dashboard is the central interface that combines all the visualizations into an interactive analytical tool. It includes:

- A line chart for year-wise trend in victim count.
- Column charts for purpose-wise and age-group-wise comparisons.
- Doughnut charts for gender breakdown.
- 2D column chart for regional comparison.
- A map for geographic distribution of cases.

Slicers were added for interactive filtering based on year, state/UT, purpose, gender, and age group.

- Purpose: To provide a dynamic and interactive overview of crime data.

- Insights: Enables stakeholders to drill down into specific crime types, regions, or demographics to identify targeted intervention strategies.

#### vii. Filtered Map

The filtered map shows the distribution of child trafficking and abduction cases across India. It includes filters for year, region, purpose, gender, and age.

- Purpose: To visualize the spatial distribution of crime.
- Insights: The map shows clusters of high case counts in northern and eastern India, with possible links to socio-economic and geographic factors.

#### viii. Visualization Insights

Each visualization contributes unique insights into child abduction and trafficking patterns:

- The line chart displays annual fluctuations and long-term trends.
- Column charts highlight disparities in trafficking purposes and age groups.
- Doughnut charts emphasize gender-based victimization.
- The 2D column chart shows regional distribution and reveals which states are most affected.
- The dashboard allows users to explore data through multiple dimensions interactively.
- The filtered map reveals geographic patterns and potential links to regional vulnerabilities.

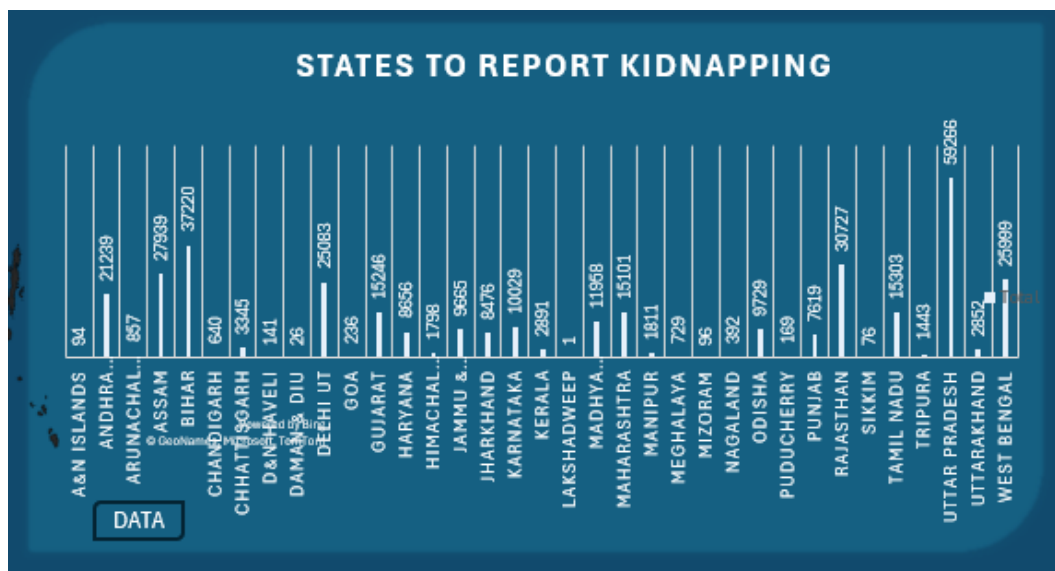
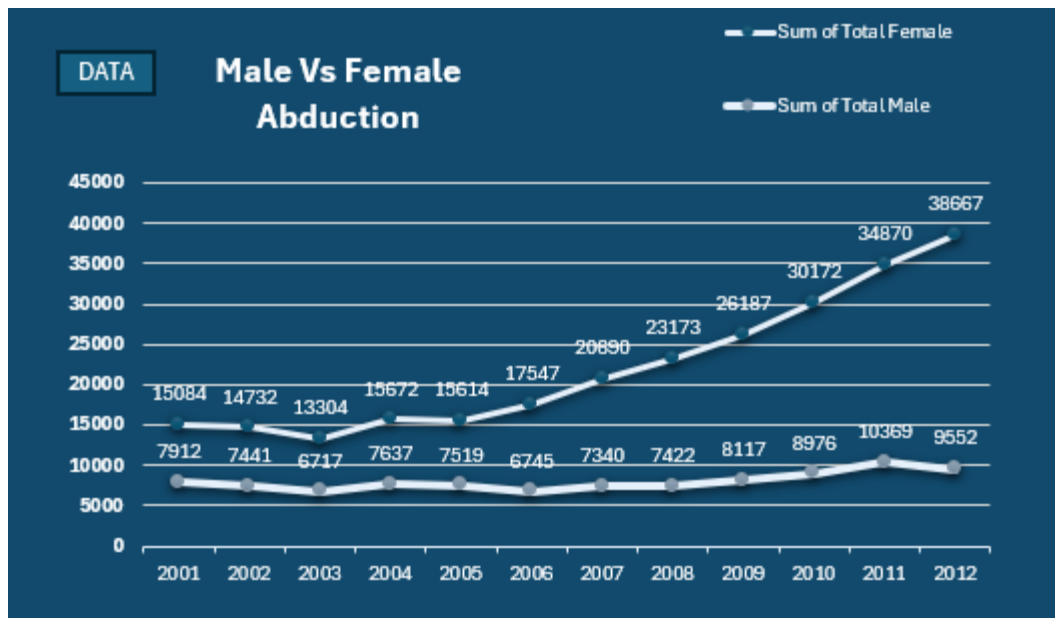
#### ix. Example Visualizations

The report includes the following charts and figures for reference:

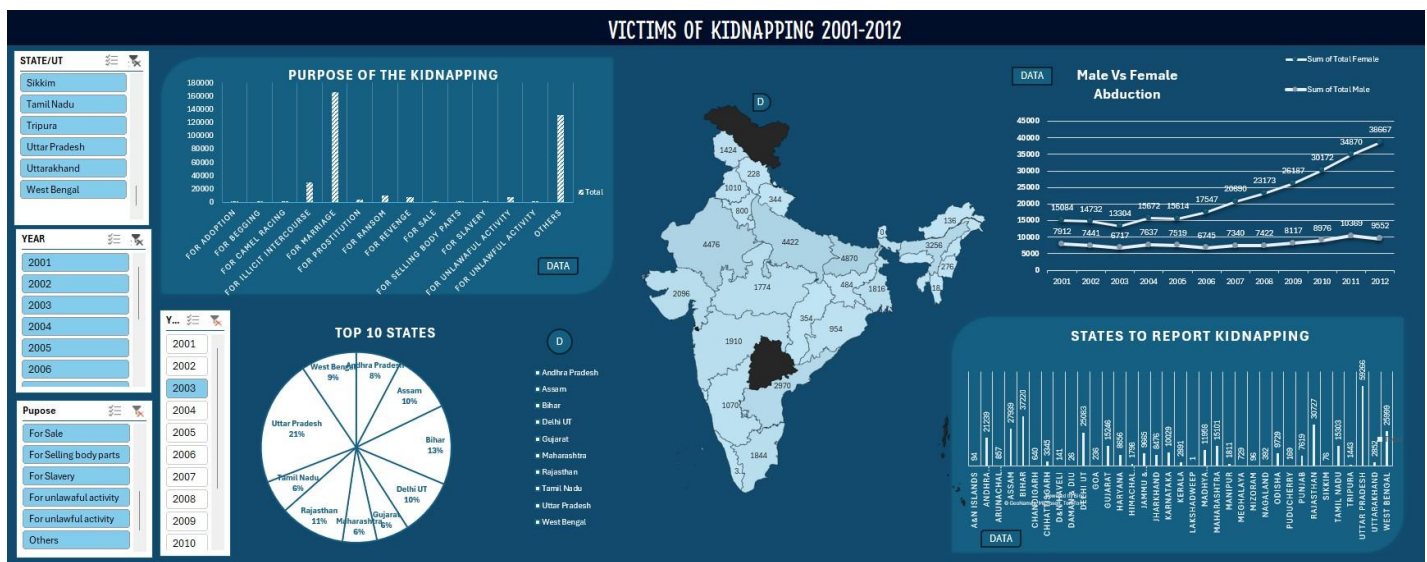
- Line Chart: Year-wise Trend in Victim Count (illustrating trends over time).
- Column Chart: Purpose-wise Victim Count (comparing different exploitation types).
- Dashboard: An integrated tool for exploring data by filters like year, region, gender, and purpose.
- Filtered Map: State/UT-wise Distribution of Victims (interactive, to explore regional trends).

## Outputs:





## Dashboard:



## **GITHUB AND LINKEDIN LINKS**

- **Github: [https://github.com/chabhijeet004/kidnapping\\_in\\_India](https://github.com/chabhijeet004/kidnapping_in_India)**
- **Linkedin : [https://www.linkedin.com/posts/abhijeet-chauhan-722a32247\\_dataforgood-exceldashboard-childprotection-activity-7316825381666181120-Rb89?utm\\_source=share&utm\\_medium=member\\_desktop&rcm=ACoAAD0y7IoBq44mep9cx5OOdnYU0ccU1vNc4Cc](https://www.linkedin.com/posts/abhijeet-chauhan-722a32247_dataforgood-exceldashboard-childprotection-activity-7316825381666181120-Rb89?utm_source=share&utm_medium=member_desktop&rcm=ACoAAD0y7IoBq44mep9cx5OOdnYU0ccU1vNc4Cc)**

## 5. Conclusion

The issue of child abduction and trafficking in India presents a complex and deeply concerning challenge that continues to impact the safety, well-being, and future of thousands of children. This report, through comprehensive analysis and visualizations, sheds light on the key trends, demographic patterns, and geographic hotspots associated with this serious crime. By exploring the data from various angles—age, gender, purpose, region, and year—the study offers a clearer understanding of the scale and nature of child trafficking across the country.

Key findings from the analysis include:

1. Consistent and Alarming Trends in Reported Cases:

The line chart analysis reveals a persistent occurrence of child abduction and trafficking across multiple years. Although fluctuations exist, certain years show spikes in reported cases, possibly due to improved reporting systems, increased public awareness, or rising crime rates. These trends highlight the ongoing need for vigilance and intervention.

2. Exploitation Purposes Vary by Region and Victim Profile:

The column chart analysis shows that children are trafficked for various exploitative purposes such as forced labor, sexual exploitation, begging, and domestic servitude. Some purposes are more prevalent in specific regions, indicating the need for location-specific policies and protective measures.

3. Gender Disparity in Victimization:

The doughnut chart demonstrates a significant gender gap, with female children being disproportionately affected—particularly in cases of sexual exploitation and domestic labor. This points to a critical need for gender-sensitive policies and protective frameworks.

4. Regional Hotspots Require Targeted Attention:

The 2D column chart and geographic visualizations highlight states like West Bengal, Bihar, Uttar Pradesh, and Rajasthan as having higher reported incidences of child trafficking. These areas may suffer from socio-economic vulnerabilities, porous borders, or inadequate law enforcement, calling for urgent, region-specific interventions.

5. Influence of Socio-Economic and Policy Factors:

Analysis indicates that regions with high poverty levels, poor education, and lack of



awareness tend to report higher victim counts. Conversely, states with active child protection programs, better surveillance, and NGO involvement see relatively fewer cases. This underlines the importance of strong institutional support and policy enforcement.

#### 6. Interactive and Insightful Dashboard:

The dynamic dashboard developed for this project provides a user-friendly and interactive way to explore child trafficking data. With filters for gender, age group, purpose, year, and region, it allows users to drill down into specific subsets of data and draw focused insights. This tool can support both awareness campaigns and policy formulation.