**Subject:** Mini Project & PBL **Subject Code**: BDA3PR01A

**Course:** TY BSc DSBDA

**Team Details:**

| **Sr. No.** | **Name** | **PRN** |
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**Idea:**

***Build a real-time, AI-powered system to detect and report traffic violations***

**Description:**

Develop an intelligent system using AI and computer vision to monitor live traffic feeds or CCTV footage to detect common traffic violations such as:

* Not wearing a helmet.
* Jumping red lights.
* Triple riding on bikes.
* Overspeeding (if integrated with speed estimation)

**Objective:**

* Automate the monitoring of traffic violations
* Reduce manual efforts of traffic authorities
* Improve road safety and enforcement through timely reporting
* Encourage disciplined driving by increasing accountability

**Tools/Tech Stack:**

| **Programming Language:** | **Python** |
| --- | --- |
| **Computer Vision:** | **OpenCV, MediaPipe** |
| **AI/ML Models:** | **YOLOv5/YOLOv8 or OpenCV + Haar cascades** |
| **Deep Learning:** | **TensorFlow or PyTorch** |
| **Frontend :** | **HTML, CSS, JS (React optional)** |
| **Backend:** | **Flask / Node.js** |
| **Database:** | **MongoDB / Firebase / MySQL** |
| **Cloud Storage:** | **AWS / Firebase** |
| **Deployment:** | **Localhost** |

**How we divide into mini project & PBL:**

| **Phase** | **Mini-Project / PBL Focus** | **Description** |
| --- | --- | --- |
| **PBL 1** | **Violation Detection (Helmet, Tripling, Red Light)** | **Train/test models or use pre-trained YOLO models to detect violations from images/videos** |
| **mini-project** | **Violation Logging & Report Generation** | **Store detections with metadata (time, place, violation type) in a database with image snapshots** |
| **PBL 2** | **Live Feed Processing** | **Integrate a webcam or IP feed and run detection in real time** |
| **miniproject** | **Admin Dashboard** | **Build a web interface to view reports, images, search by date/type, and export reports** |

**Team member roles (optional):**

| **Role** | **Responsibilities** |
| --- | --- |
| **Team Lead / Planner** | Coordinates tasks, documentation, manages Git repo |
| **ML Engineer** | Builds and trains the AI models for violation detection |
| **Backend Developer** | Handles server logic, database, report generation |
| **Frontend Developer** | Designs and builds the admin dashboard or web UI |
| **DevOps / Deployment Lead** | Handles camera integration, deployment, API hosting |
| **Tester / QA** | Tests with real/fake footage, stress tests the system |