# Report

In this experiment, the primary objective was to enhance an existing dataset by introducing a new class, "dog" (in my case), and subsequently train a YOLOv11n detection model capable of detecting three distinct classes: "person," "box," and "dog." The process began by leveraging a pre-trained YOLOv8n model to detect dog instances across the provided dataset. This model was chosen for its lightweight architecture, which offers a balance between speed and accuracy, making it well-suited for this preliminary detection task. After detecting the locations of dogs within the dataset, the results were integrated into the dataset's existing annotation files. Each detected dog instance was appended to the corresponding annotation file in YOLO format, ensuring compatibility with subsequent training pipelines.

Once the dataset was enriched to include dog annotations, the next phase involved training a YOLOv11n detection model. This model was trained to detect three classes: "person," "box," and "dog." The training was conducted on the updated dataset to ensure that the model could accurately learn and generalize across all three classes. Specific attention was paid to preserving the original dataset's annotations while seamlessly integrating the new dog annotations. The training process utilized a batch size and epoch count carefully selected to balance computational efficiency with model performance, considering the available hardware resources.

The YOLOv11n model, being a newer architecture, was chosen for its capability to handle larger datasets and provide improved accuracy over its predecessors while maintaining computational efficiency. By completing this process, the experiment successfully created a robust detection model capable of identifying all three target classes. The resulting model represents a significant enhancement over the initial dataset and model configuration, aligning well with the requirements for practical deployment and evaluation. This iterative process of dataset augmentation and model training underscores the importance of combining automated detection with manual validation to achieve high-quality results in object detection tasks.