TO DEVELOP CNN BASED VEHICLE DAMAGE DETECTION MODEL

Algorithm :-

1. Mount Google Drive:
    - The first step is to mount your Google Drive so you can access and store files during the session.
2. Install Dependencies:
    - You need to install the necessary Python libraries, specifically torch, which is essential for running YOLOv5, and import important libraries for image display.
3. Clone YOLOv5 Repository:
    - You clone the YOLOv5 repository from GitHub to your Colab environment and install its dependencies listed in a requirements file.
4. Define Paths and Variables:
    - Set up paths for where your training and validation datasets are stored and define the ratio for splitting the data into training and validation sets.
5. Prepare Dataset:
    - List all the image and annotation files and calculate the number of images for training and validation based on the specified ratios.
6. Copy Files to Train and Validation Directories:
    - Define a function to copy the images and their corresponding annotation files into their respective train and validation folders.

7. Create Dataset YAML File:
    - Write and save a configuration file (YAML) that specifies the paths to the training and validation datasets, the number of classes, and their names.
8. Train the Model:
    - Run a training script to train the YOLOv5 model using the prepared dataset and the defined parameters like image size, batch size, number of epochs, and initial weights.
9. Detect Objects:
    - Use the trained model to perform object detection on new images and display the results.
10. Apply Image Processing and Save Results:

- Apply several image processing techniques to the detected images, such as converting to grayscale, thresholding, and performing morphological operations. Finally, display and save the processed images.