1. What do REGION PROPOSALS entail?

Region proposals are a set of bounding boxes or regions in an image that are likely to contain objects of interest. They are generated by various methods, such as selective search or deep learning-based region proposal networks (RPNs), and are used as input to object detection systems to focus on specific regions for further analysis.

2. What do you mean by NON-MAXIMUM SUPPRESSION? (NMS)

Non-Maximum Suppression is a post-processing step in object detection and localization. It is used to eliminate redundant and overlapping bounding boxes. NMS selects the bounding box with the highest confidence score and suppresses (removes) boxes that have a significant overlap (as defined by an IoU threshold) with the selected box.

3. What exactly is mAP?

mAP is a commonly used performance metric for object detection and image segmentation tasks. It calculates the average precision across multiple object categories. It quantifies the trade-off between precision and recall and provides an overall measure of the model's accuracy in locating and classifying objects.

4. What is a frames per second (FPS)?

Frames per second is a metric used to measure the speed at which a computer or device can process and display images or video frames. In the context of computer vision and object detection, it refers to the rate at which an algorithm or system can process and analyze frames or images per second.

5. What is an IOU (INTERSECTION OVER UNION)?

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6. Describe the PRECISION-RECALL CURVE (PR CURVE)

The Precision-Recall curve is a graphical representation of a model's performance in binary classification tasks. It shows the trade-off between precision (the fraction of true positive predictions among all positive predictions) and recall (the fraction of true positive predictions among all actual positives) for different classification thresholds. A PR curve helps assess a model's ability to balance precision and recall.

7. What is the term "selective search"?

Selective Search is a region proposal method used in computer vision to generate potential object regions in an image. It works by segmenting the image into regions and merging them based on various criteria to produce a set of diverse and selective bounding box proposals for object detection.

8. Describe the R-CNN model's four components.

R-CNN (Region-Based Convolutional Neural Network) consists of four main components:

1. Region Proposal: The initial region proposals are generated, typically using a method like selective search.
2. CNN Feature Extraction: Features are extracted using a pre-trained Convolutional Neural Network (CNN) from the proposed regions.
3. Classification: These features are used for object classification using a classifier (e.g., SVM or softmax).
4. Regression: Bounding box refinements are applied to improve localization accuracy.

9. What exactly is the Localization Module?

The localization module in an object detection system is responsible for refining the bounding box coordinates of detected objects. It adjusts the coordinates based on the features extracted from the CNN to improve the precision of object localization.

10. What are the R-CNN DISADVANTAGES?

R-CNN and its variants have several disadvantages, including:

* Slow inference speed due to the need to process each region proposal individually.
* High memory consumption and storage requirements for storing feature maps for each region proposal.
* Complex training process with separate components.
* Difficulty in end-to-end training and optimization.
* Limited scalability to real-time or large-scale object detection tasks.