



**deeplearning.ai**

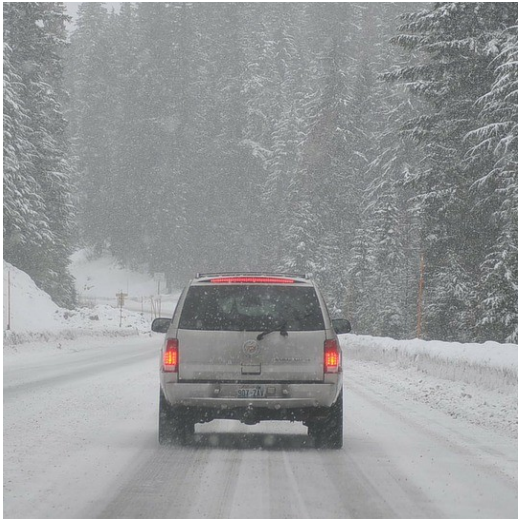
# Object Detection

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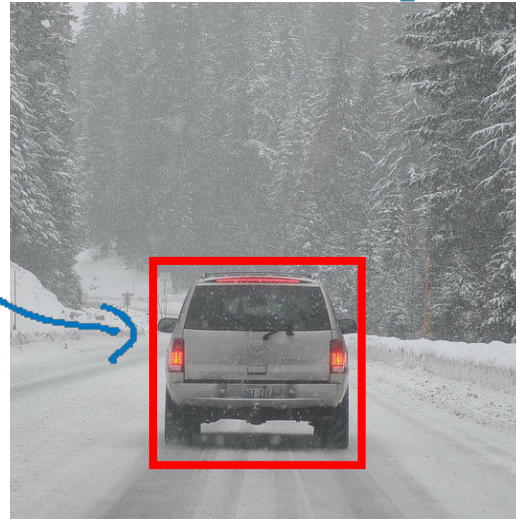
# Object localization

# What are localization and detection?

Image classification



Classification with  
localization



Detection



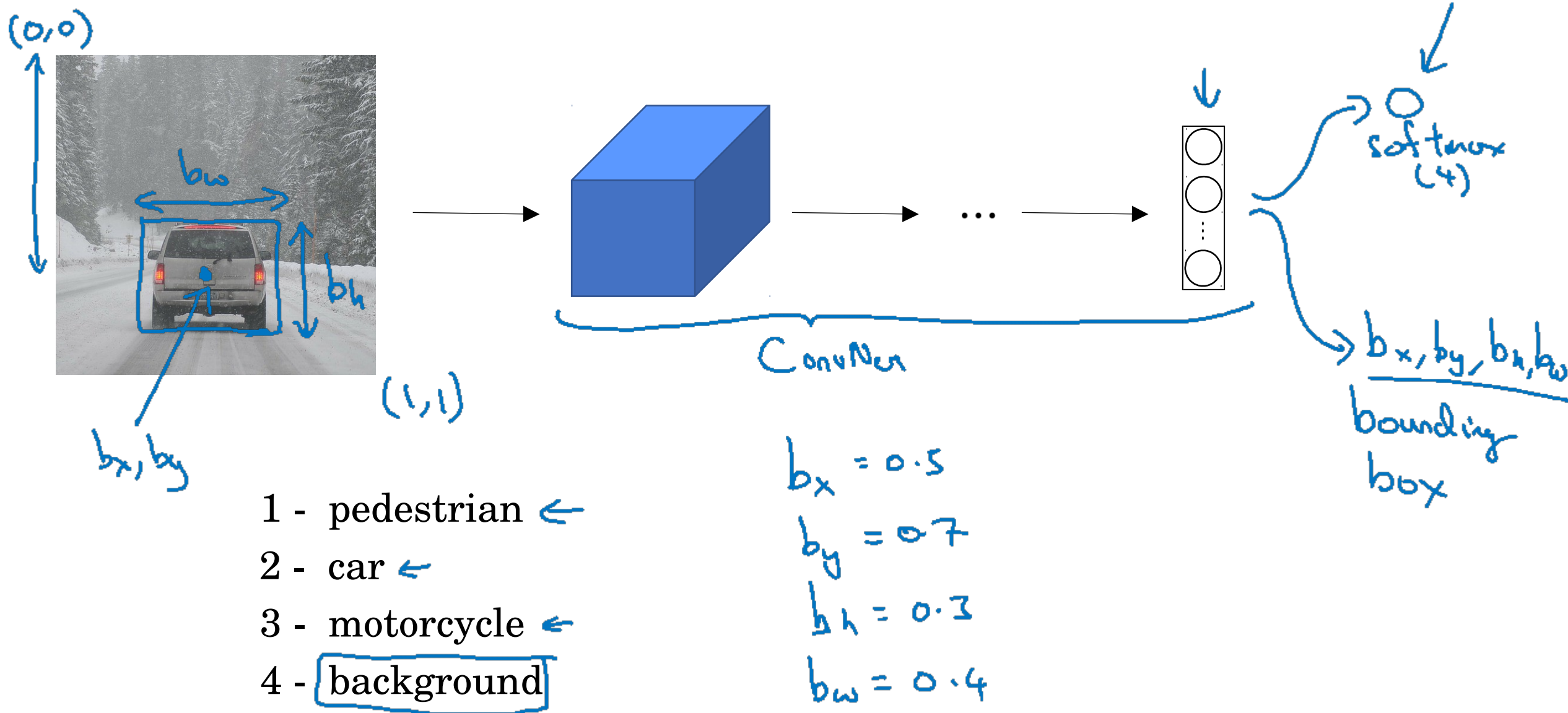
"Car"

"Car"

1 object

multiple  
objects

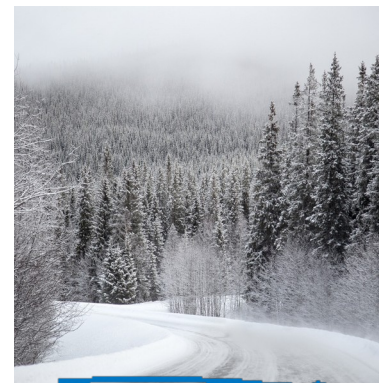
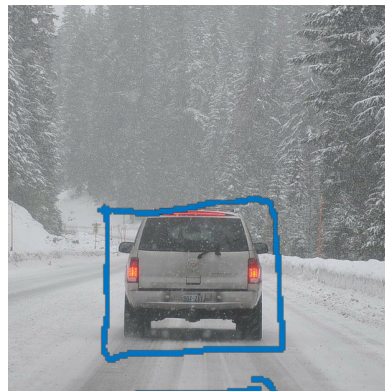
# Classification with localization



# Defining the target label y

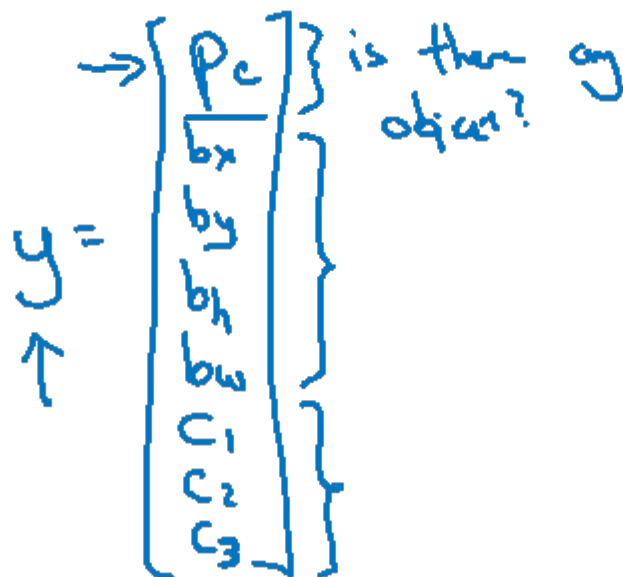
- 1 - pedestrian
- 2 - car ←
- 3 - motorcycle
- 4 - background ←

Need to output class label (1-4)



$x =$

$$L(\hat{y}, y) = \begin{cases} (\hat{y}_1 - y_1)^2 + (\hat{y}_2 - y_2)^2 + \dots + (\hat{y}_n - y_n)^2 & \text{if } y_1 = 1 \\ (\hat{y}_1 - y_1)^2 & \text{if } y_1 = 0 \end{cases}$$



$(x, y)$

