

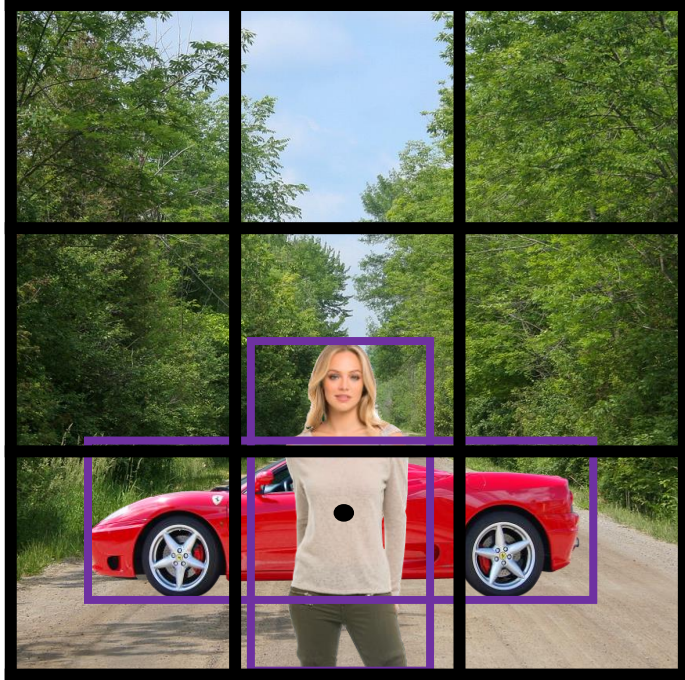


deeplearning.ai

Object Detection

Anchor boxes

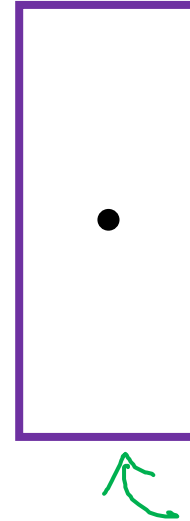
Overlapping objects:



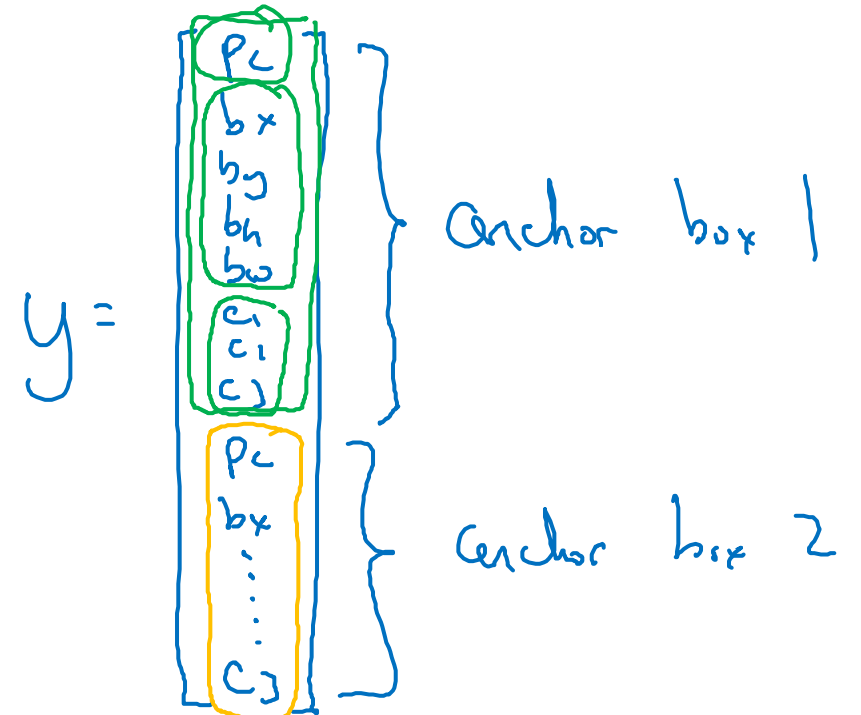
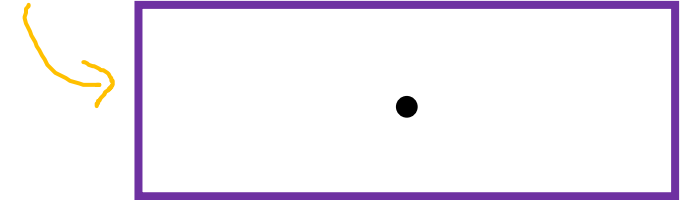
$$y = \begin{bmatrix} p_c \\ b_x \\ b_y \\ b_h \\ b_w \\ c_1 \\ c_2 \\ c_3 \end{bmatrix}$$

Handwritten annotations: A green arrow points from p_c to the center dot in the image patch. A blue arrow points from b_x to the left edge of the bounding box. A blue bracket groups c_1, c_2, c_3 .

Anchor box 1:



Anchor box 2:

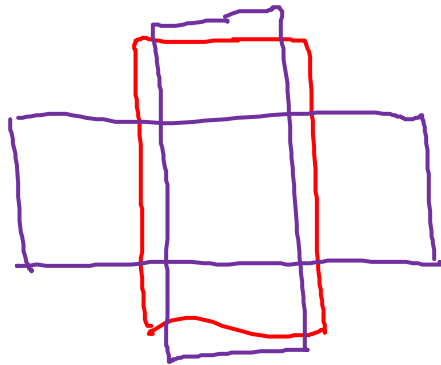


Anchor box algorithm

Previously:

Each object in training image is assigned to grid cell that contains that object's midpoint.

Output y :
 $3 \times 3 \times 8$



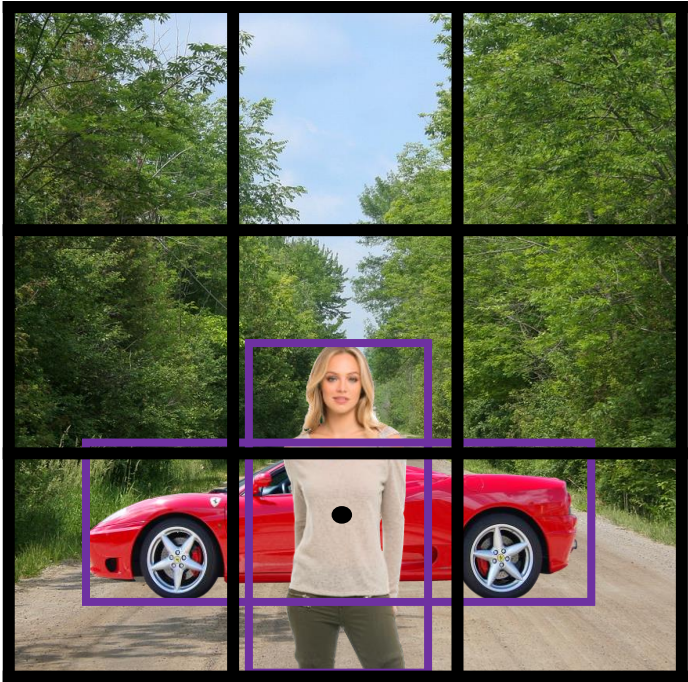
With two anchor boxes:

Each object in training image is assigned to grid cell that contains object's midpoint and anchor box for the grid cell with highest IoU.

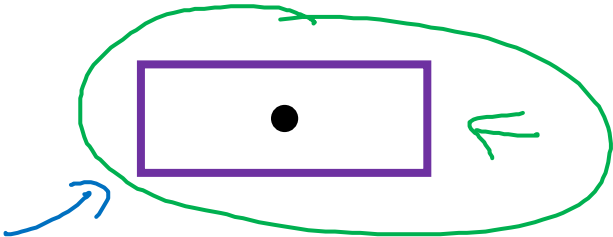
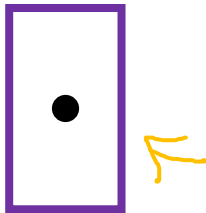
(grid cell, anchor box)

Output y :
 $3 \times 3 \times 16$
 $3 \times 3 \times 2 \times 8$

Anchor box example



Anchor box 1: Anchor box 2:



y =

$$\begin{bmatrix} p_c \\ b_x \\ b_y \\ b_h \\ b_w \\ c_1 \\ c_2 \\ c_3 \\ p_c \\ b_x \\ b_y \\ b_h \\ b_w \\ c_1 \\ c_2 \\ c_3 \end{bmatrix}$$

1

bx

by

bh

bw

1

0

0

1

bx

by

bh

bw

0

1

0

car only?

0

?

?

?

?

?

?

?

1

bx

by

bh

bw

0

1

0

anchor box 1

anchor box 2