Object Detection

Anchor boxes

deeplearning.ai

Overlapping objects:
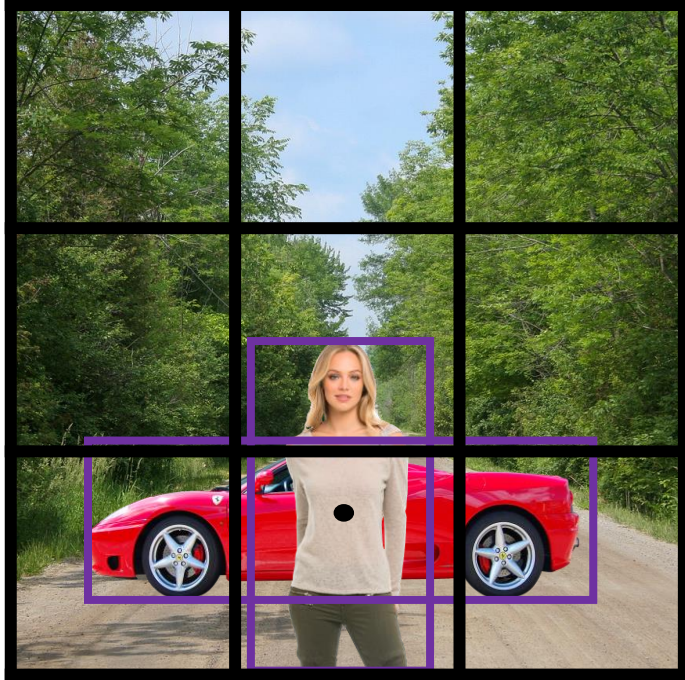
Anchor box 1:

Anchor box 2:

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

$$y = \begin{bmatrix} p_c \\ b_x \\ b_y \\ b_h \\ b_w \\ c_1 \\ c_1 \\ c_3 \\ p_c \\ b_x \\ \vdots \\ c_3 \end{bmatrix} \quad \text{Anchor box 1} \\ \text{Anchor box 2}$$

[Redmon et al., 2015, You Only Look Once: Unified real-time object detection]
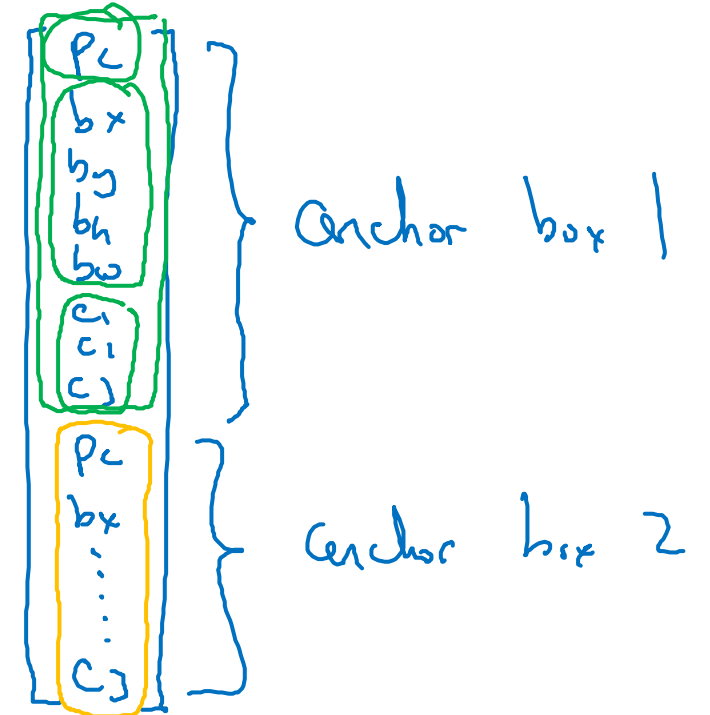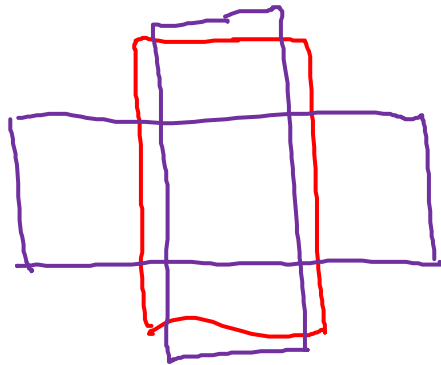
Andrew Ng
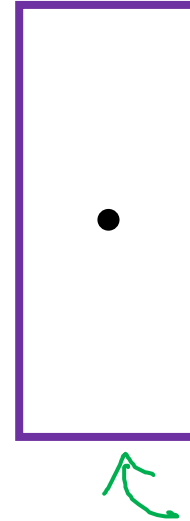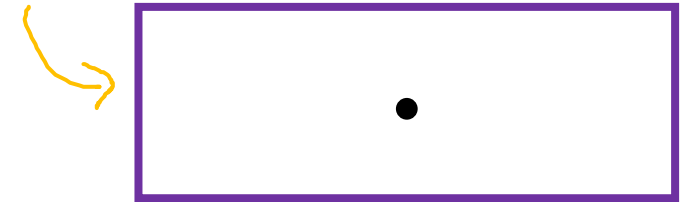
Anchor box algorithm

Previously:

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

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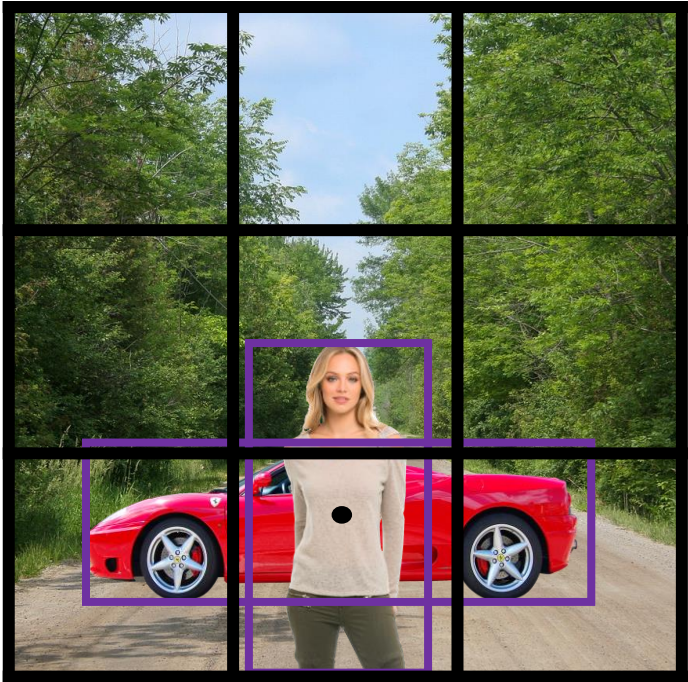
$3 \times 3 \times 8$

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.
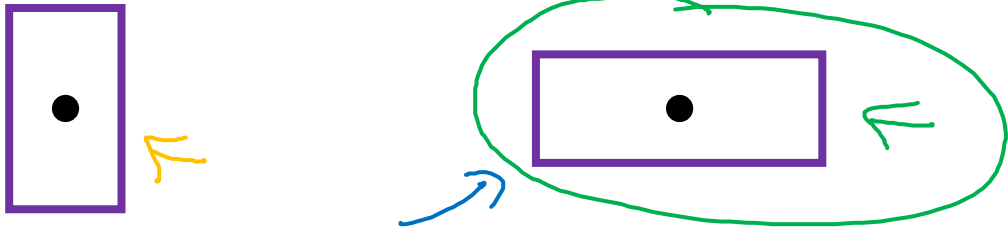
(grid cell, anchor box)

Output y:

$3 \times 3 \times 16$

$3 \times 3 \times 2 \times 8$

Anchor box example

Anchor box 1:   Anchor box 2:

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

c_3 only?

Andrew Ng