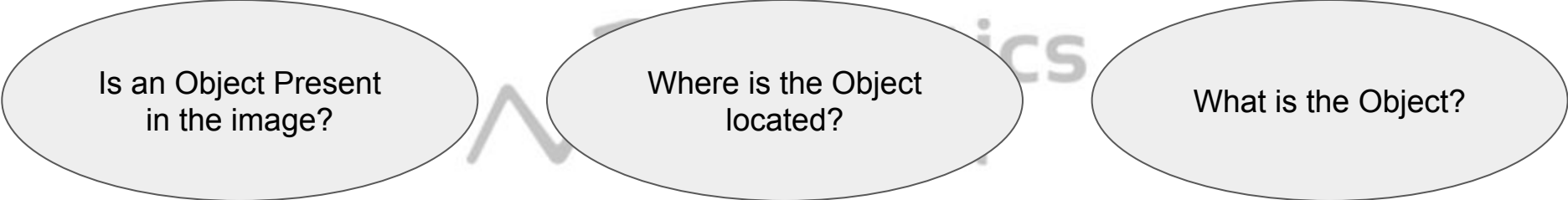# Training Data for Object Detection

Object Detection Problem Tasks

Is an Object Present in the image?

Where is the Object located?

What is the Object?

Training Data for Classification Problem

Y = 1

Input Image   Target Class

Training Data for Object Detection

Problem Statement: Identify the Location the cars in the given set of images

Training Data for Object Detection

Problem Statement: Identify the Location the cars in the given set of images

$$\begin{pmatrix} P \\ x_{min} \\ y_{min} \\ x_{max} \\ y_{max} \end{pmatrix}$$

Input Image   Target Values

Training Data for Object Detection

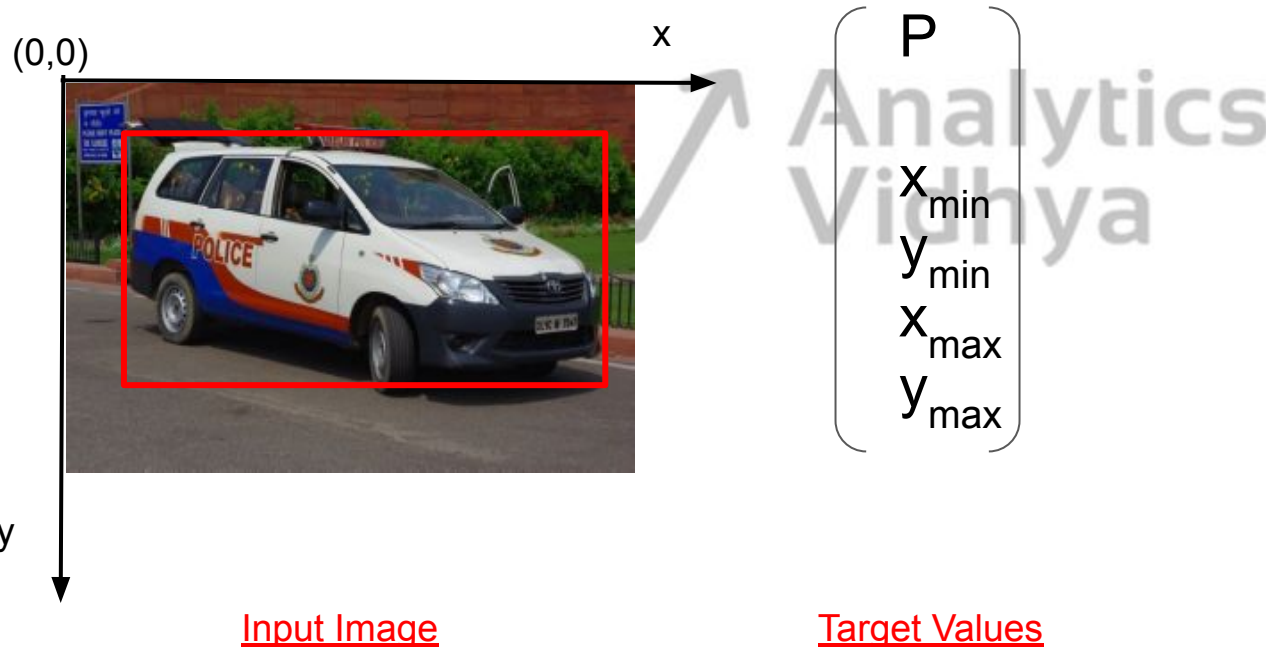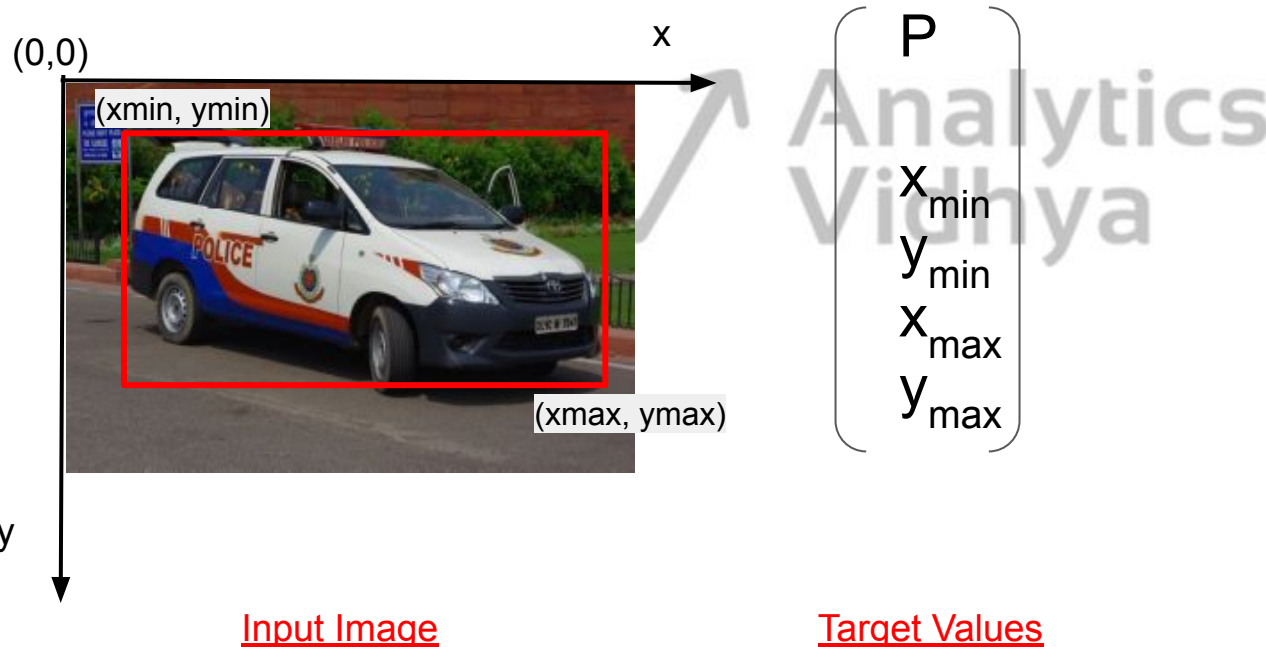**Problem Statement:** Identify the Location the cars in the given set of images

$$\begin{pmatrix} P \\ x_{min} \\ y_{min} \\ x_{max} \\ y_{max} \end{pmatrix}$$

Input Image   Target Values

Training Data for Object Detection

Problem Statement: Identify the Location the cars in the given set of images
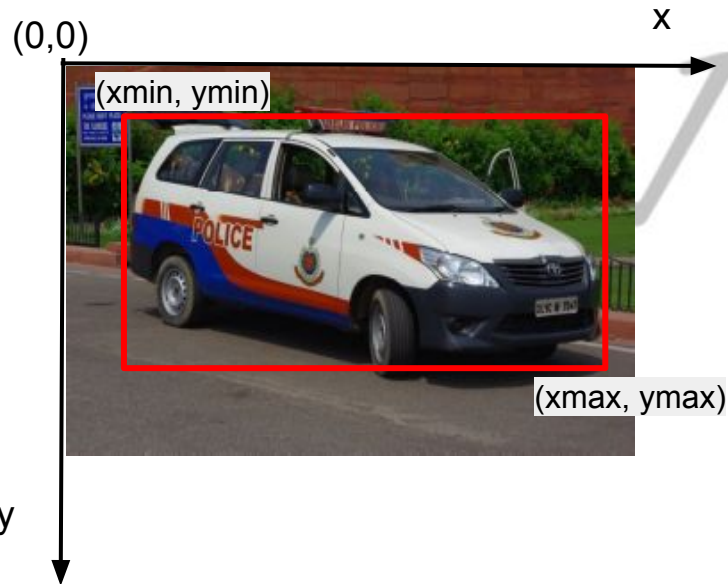

Input Image

Target Values

$$\begin{pmatrix} P \\ x_{min} \\ y_{min} \\ x_{max} \\ y_{max} \end{pmatrix}$$

Analytics Vidhya
Learn everything about analytics

Training Data for Object Detection

Problem Statement: Identify the Location the cars in the given set of images

Input Image

Target Values

$$\begin{pmatrix} P \\ x_{min} \\ y_{min} \\ x_{max} \\ y_{max} \end{pmatrix}$$

Is an Object Present in the image?

Where is the Object located?

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Training Data for Object Detection

Problem Statement: Identify the Location the cars in the given set of images
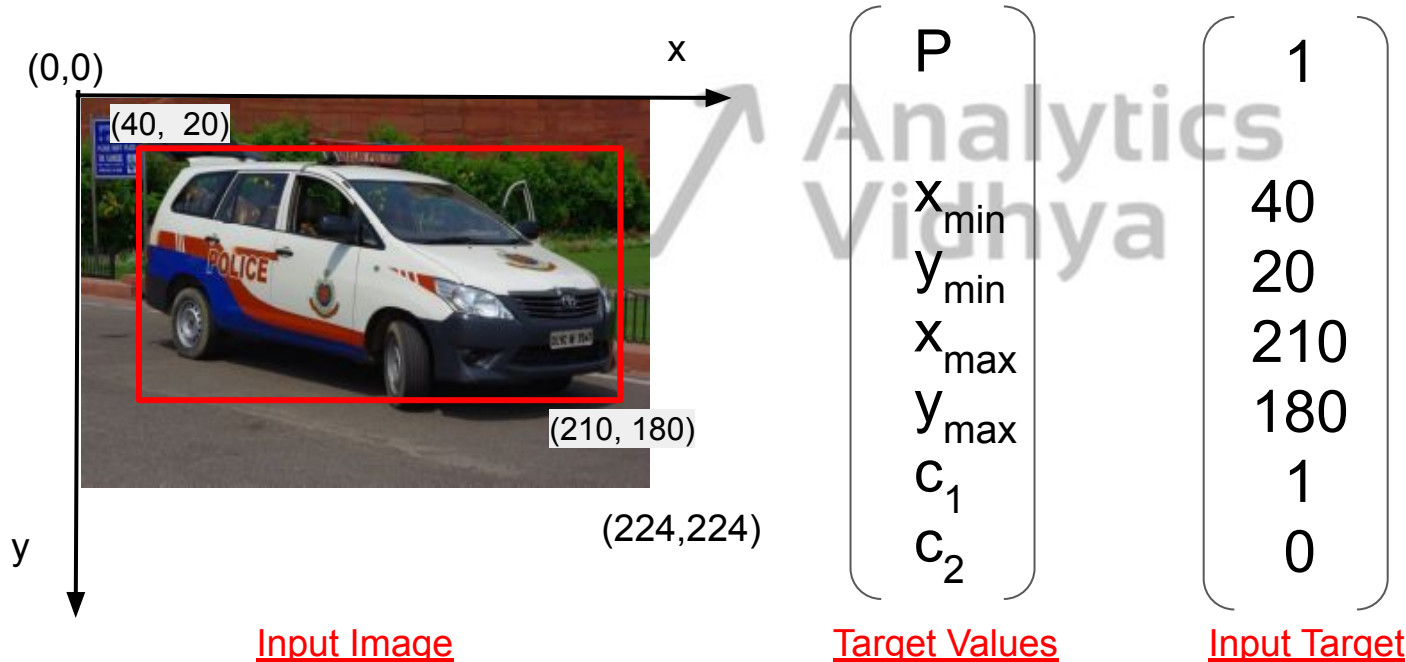

Sample Input Images

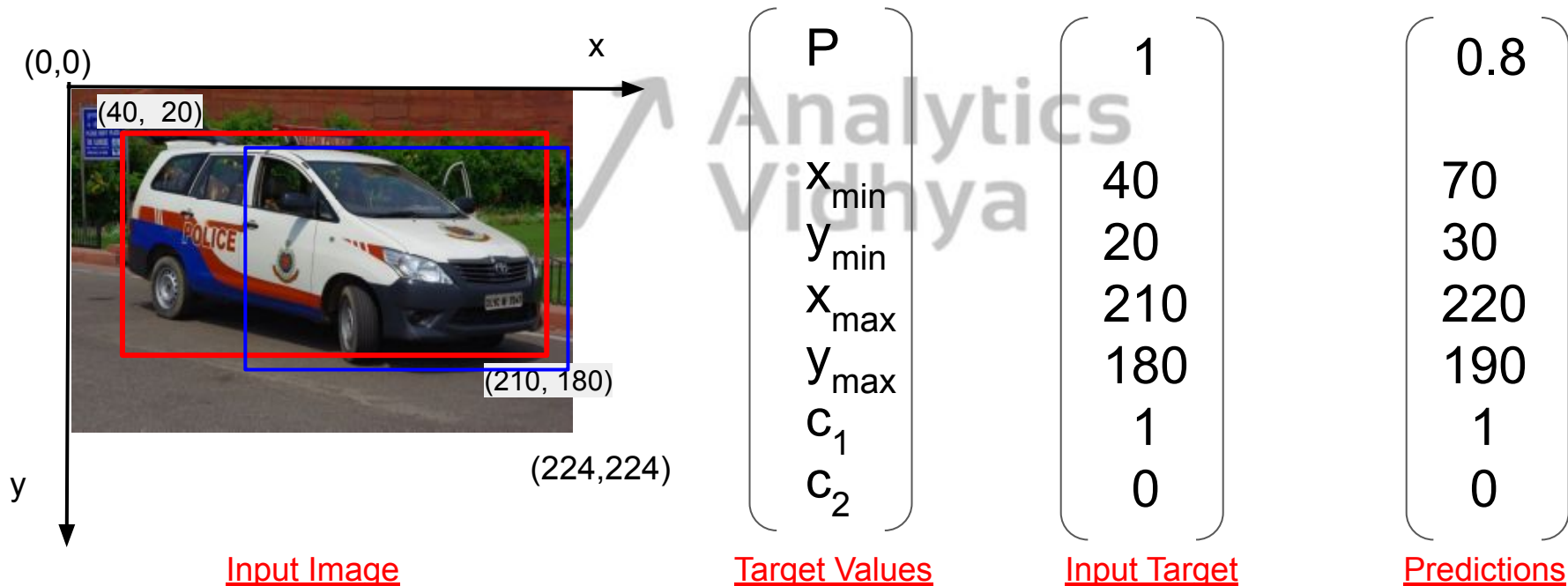$$\begin{pmatrix} P \\ x_{min} \\ y_{min} \\ x_{max} \\ y_{max} \\ c_1 \\ c_2 \end{pmatrix}$$

Target Values

Training Data for Object Detection

Problem Statement: Identify the Location the cars in the given set of images

Input Image

$$
\begin{array}{c}
P \\
x_{min} \\
y_{min} \\
x_{max} \\
y_{max} \\
c_1 \\
c_2
\end{array}
\qquad
\begin{array}{c}
1 \\
40 \\
20 \\
210 \\
180 \\
1 \\
0
\end{array}
$$

Target Values   Input Target

Training Data for Object Detection

Problem Statement: Identify the Location the cars in the given set of images

Input Image		Target Values	Input Target	Predictions
(0,0)	x	P	1	0.8
(40, 20)		x_{min}	40	70
		y_{min}	20	30
POLICE		x_{max}	210	220
		y_{max}	180	190
(210, 180)		c_1	1	1
(224,224)		c_2	0	0
y				

Thank You
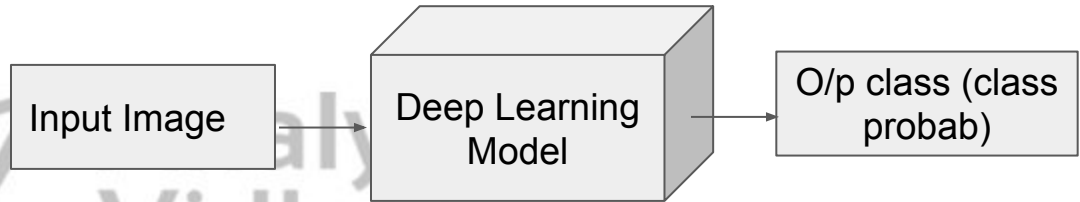
Analytics Vidhya
Learn everything about analytics

Training Data for Object Detection

$$\begin{bmatrix} P \\ b_x \\ b_y \\ b_h \\ b_w \\ c_1 \\ c_2 \\ P \\ b_x \\ b_y \\ b_h \\ b_w \\ c_1 \\ c_2 \end{bmatrix}$$
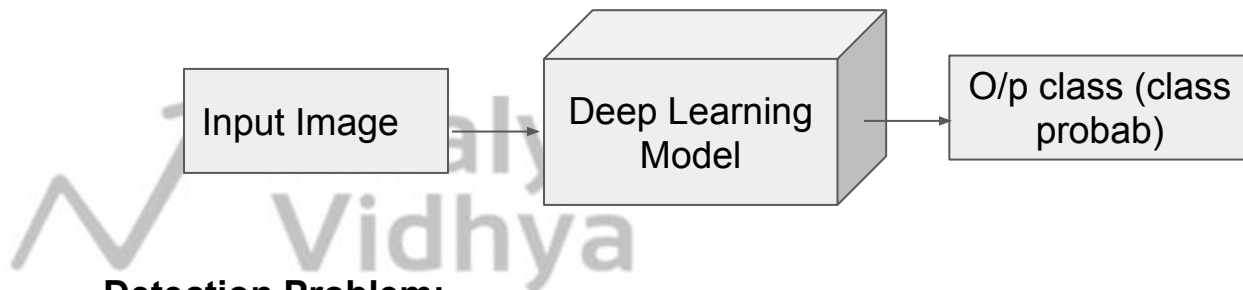
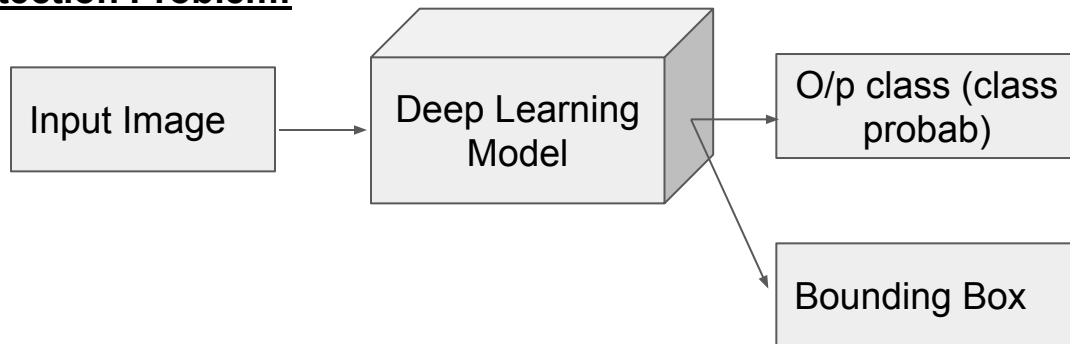# Training Data for Object Detection

Classification Problem:

Input Image → Deep Learning Model → O/p class (class probab)

Training Data for Object Detection

Classification Problem:

Input Image → Deep Learning Model → O/p class (class probab)

Detection Problem:

Input Image → Deep Learning Model → O/p class (class probab)

Bounding Box

Training Data for Object Detection

Classification Problem:

Input Image → Deep Learning Model → O/p class (class probab)

Detection Problem:

Input Image → Deep Learning Model → O/p class (class probab) / Bounding Box
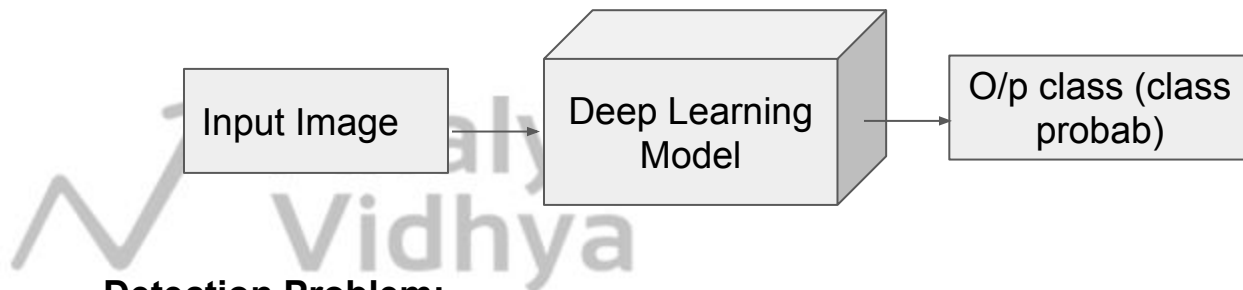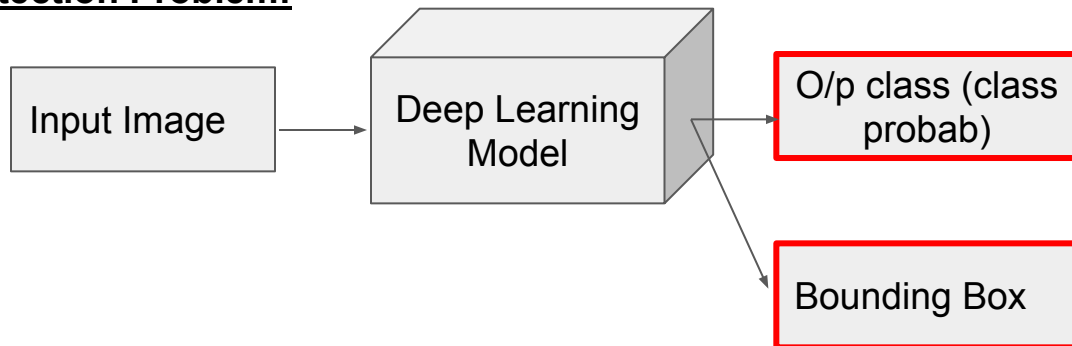
Training Data for Object Detection

Problem Statement: Identify the Location the cars in the given set of images

Is an Object Present in the image?

Where is the Object located?

What is the Object?

Test Data for Object Detection

Input Image

Target Values