Image	Confidence	TP or FP
Image 1	0.3	FP
Image 1	0.6	FP
Image 1	0.7	TP

给定一个IOU阈值，所有的框都可以判断是TP还是FP

Image	Confidence	TP or FP
Image 2	0.5	TP

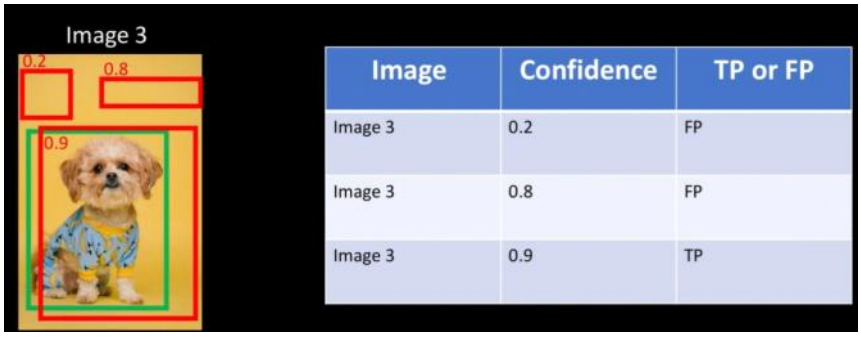


Image	Confidence	TP or FP
Image 3	0.2	FP
Image 3	0.8	FP
Image 3	0.9	TP

1. Get all bounding box predictions on our test set

Image	Confidence	TP or FP
Image 1	0.3	FP
Image 1	0.6	FP
Image 1	0.7	TP
Image 2	0.5	TP
Image 3	0.2	FP
Image 3	0.8	FP
Image 3	0.9	TP

2. Sort by descending confidence score

Image	Confidence	TP or FP
Image 3	0.9	TP
Image 3	0.8	FP
Image 1	0.7	TP
Image 1	0.6	FP
Image 2	0.5	TP
Image 1	0.3	FP
Image 3	0.2	FP

降序conf排列

3. Calculate the Precision and Recall as we go through all outputs

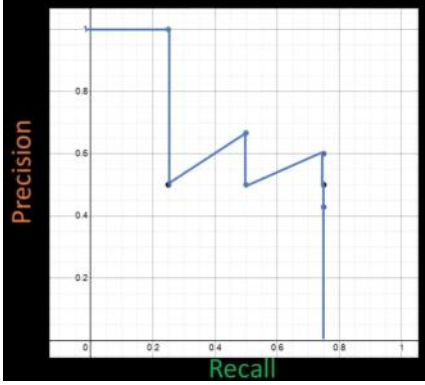
Image	Confidence	TP or FP	Precision	Recall
Image 3	0.9	TP	1 / 1	1 / 4
Image 3	0.8	FP	1 / 2	1 / 4
Image 1	0.7	TP	2 / 3	2 / 4
Image 1	0.6	FP	2 / 4	2 / 4
Image 2	0.5	TP	3 / 5	3 / 4
Image 1	0.3	FP	3 / 6	3 / 4
Image 3	0.2	FP	3 / 7	3 / 4

$$precision = \frac{TP}{TP + FP}$$ #detections

$$recall = \frac{TP}{TP + FN}$$ #gt

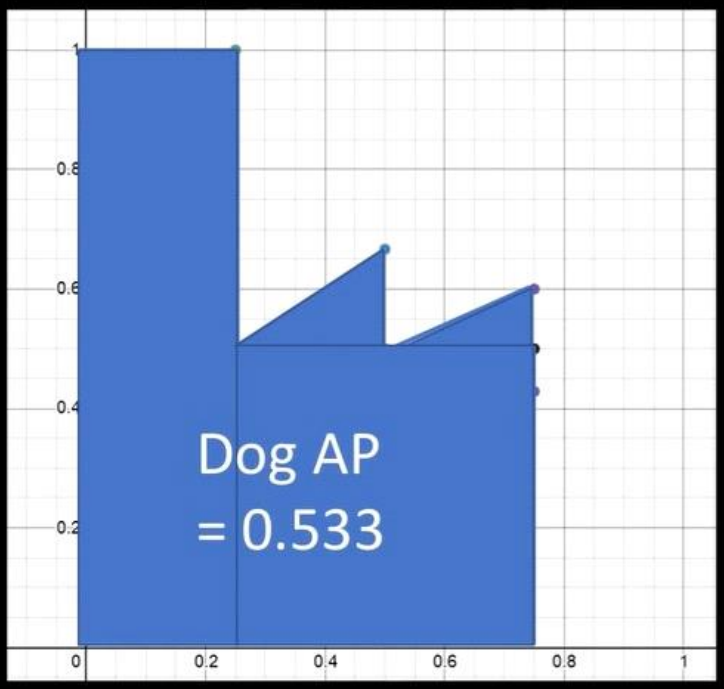
Precision 的分母是Detection,也就是说没有新一个检测框出来之前，它的分母是不会变的。但是recall的分母gt是不会受影响的。

4. Plot the Precision-Recall graph



Precision	Recall
1 / 1	1 / 4
1 / 2	1 / 4
2 / 3	2 / 4
2 / 4	2 / 4
3 / 5	3 / 4
3 / 6	3 / 4
3 / 7	3 / 4

5. Calculate Area under PR curve



面积怎么计算呢?

6. This was only for dog class, we need to calculate for all classes. Let's say we do this for cats and dogs

- Cat AP = 0.74
- Dog AP = 0.533

mAP = (0.533+0.74)/2 = 0.6365

7. All this was calculated given a specific IoU threshold of 0.5,we need to redo all computations for many IoUs, example: 0.5, 0.55, 0.6, ..., 0.95. Then average this and this will be our final result. This is what is meant by mAP@0.5:0.05:0.95