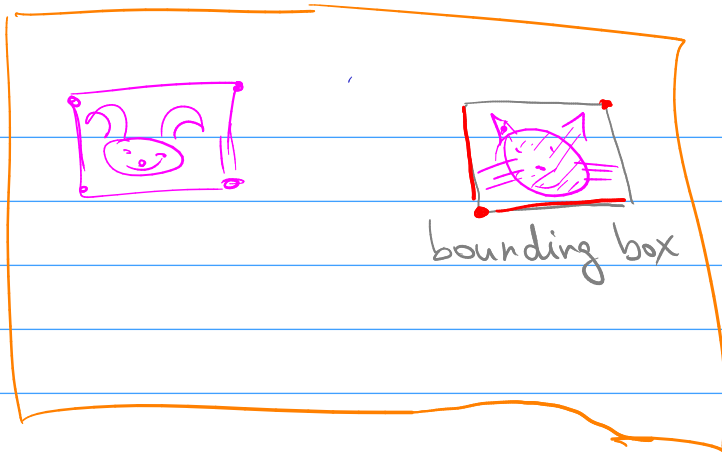
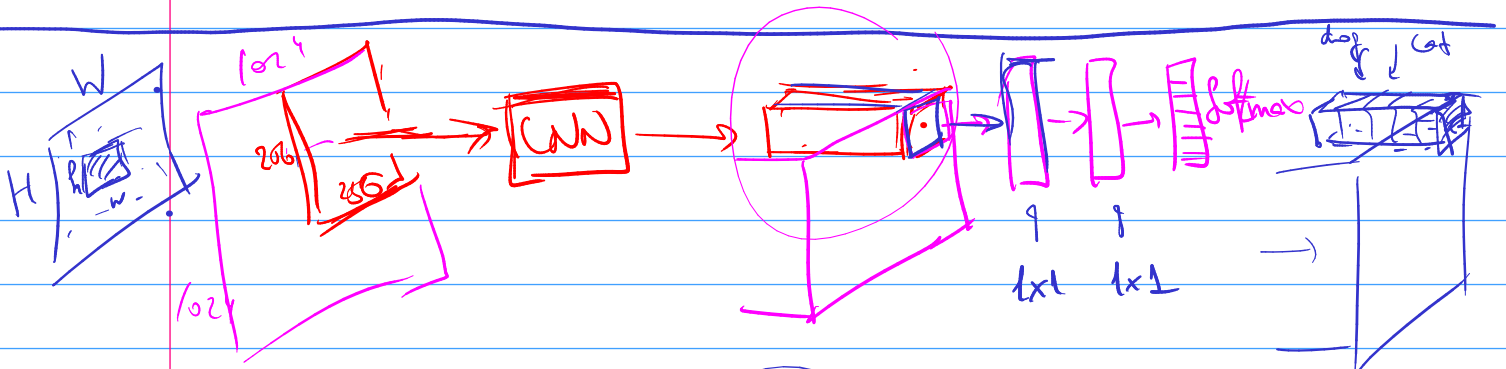
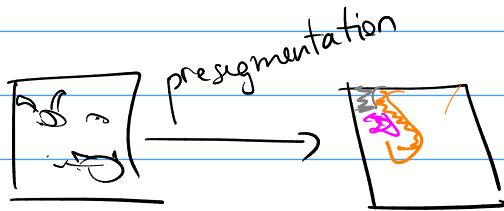
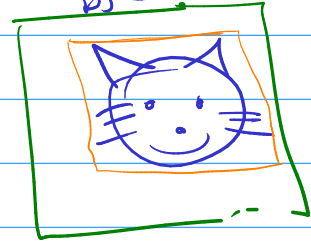


# Object detection

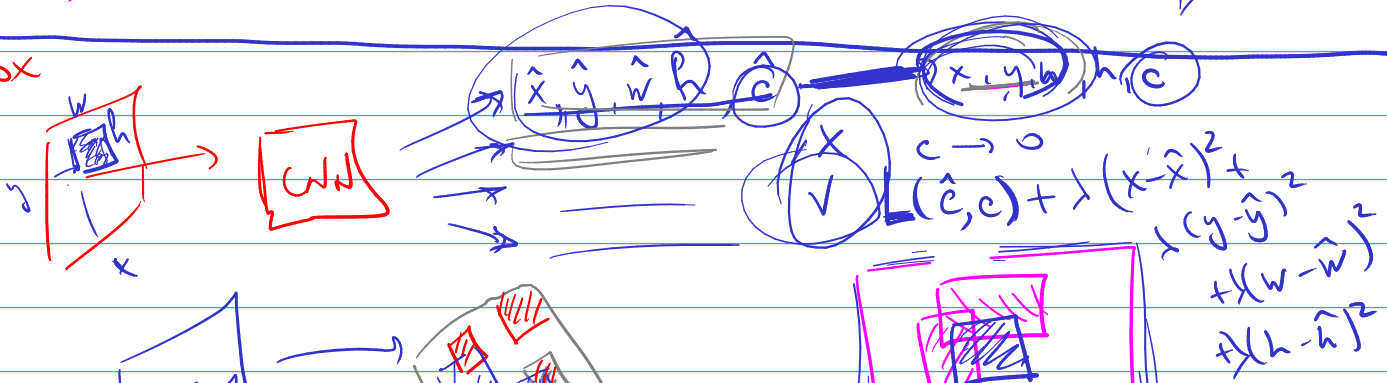
Image  $\rightarrow$  bbox - 4xint, C



Object localization

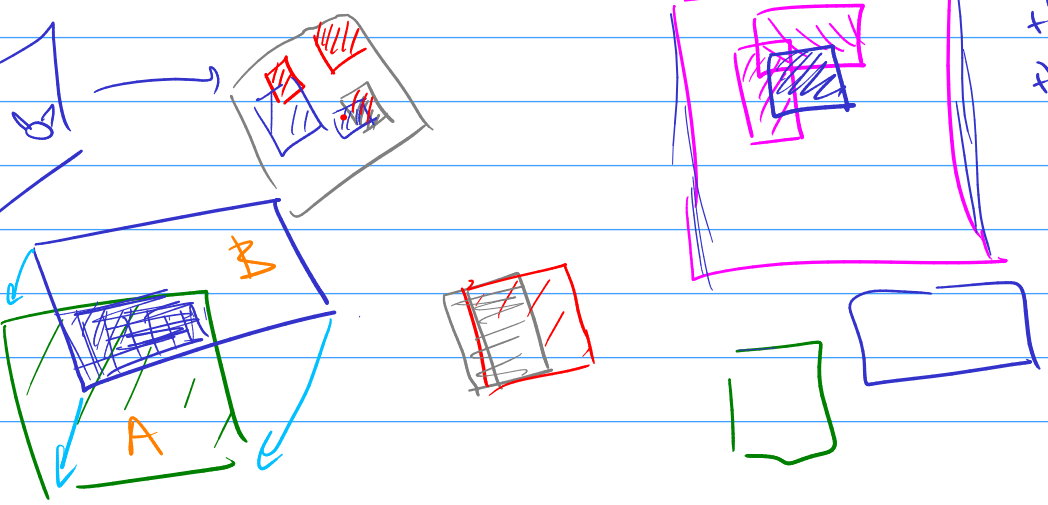


## Multibox

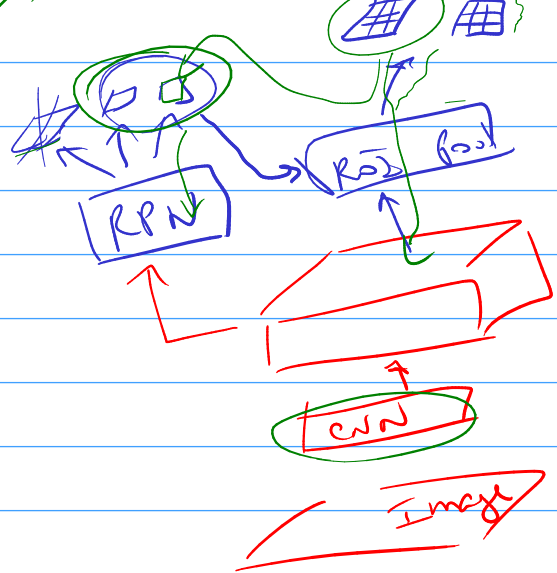
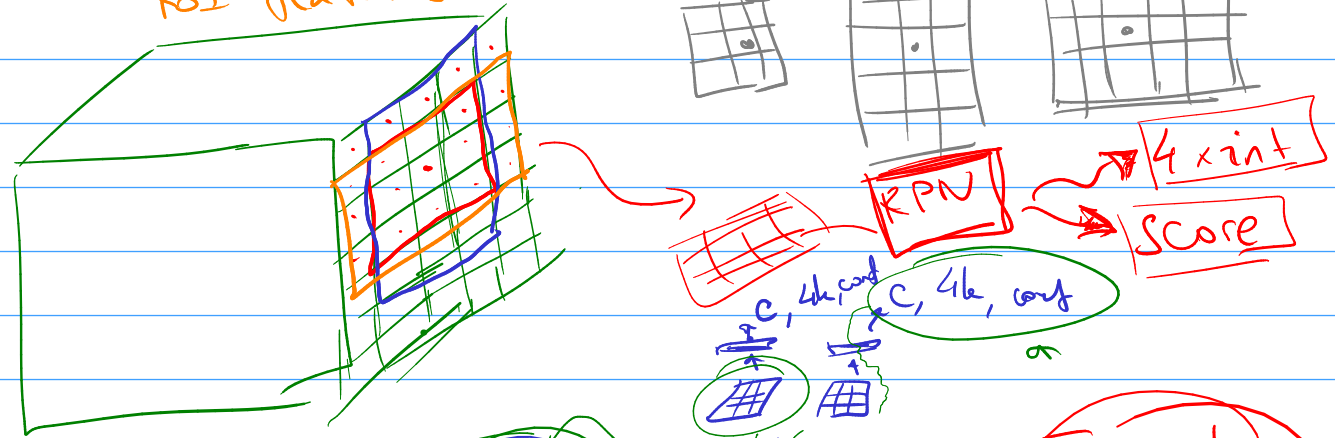
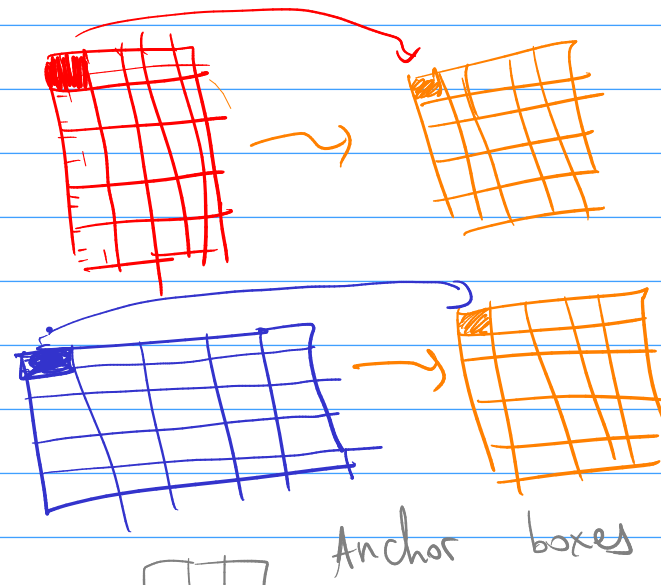
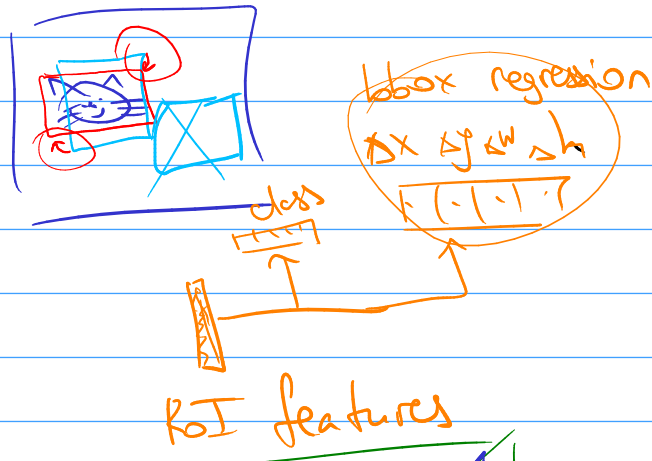
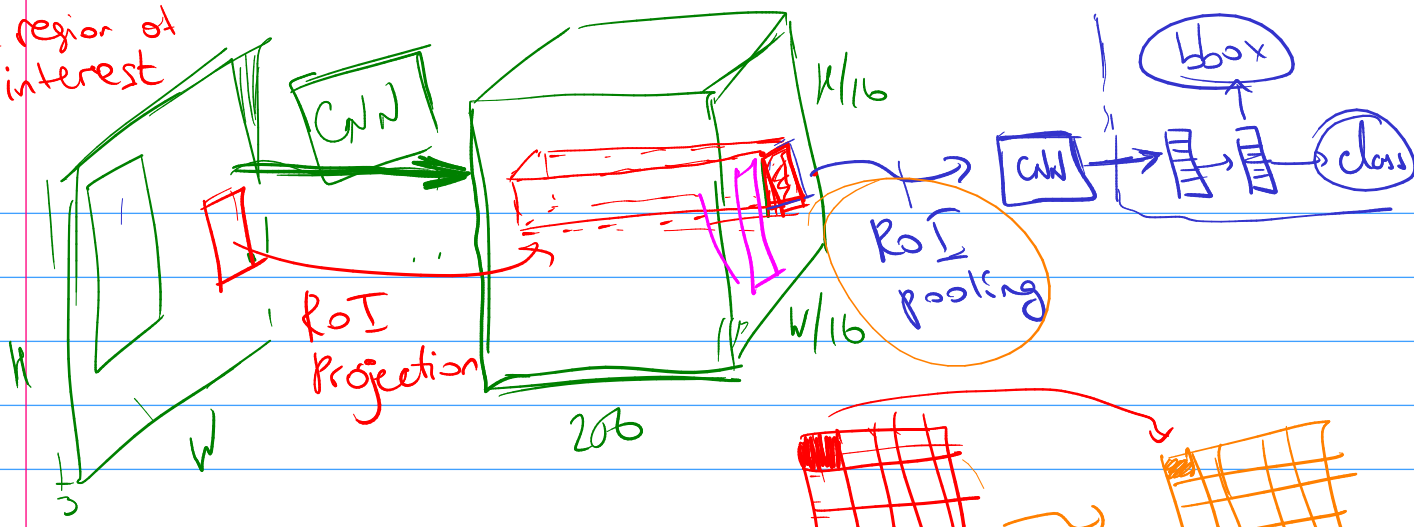


$$IoU = \frac{|A \cap B|}{|A \cup B|}$$

1/2

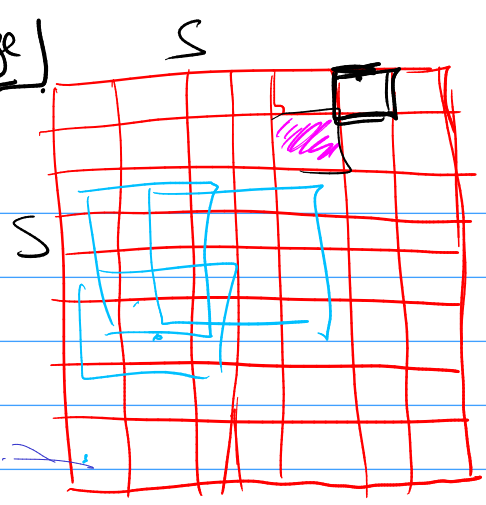


RoI - region of interest



Two-stage obj. det

One-Stage



$$\sum_x \sum_y (C + 5 \cdot B)$$

$$L = \sum_{s=1}^{S_{max}} \sum_{k=1}^B [ \text{mpab} ] \left[ (\hat{x}_k - x)^2 + (\hat{y}_k - y)^2 + (\sqrt{\hat{w}_k} - \sqrt{w})^2 + (\sqrt{\hat{h}_k} - \sqrt{h})^2 \right]$$

$$+ \lambda_2 \sum_s \sum_k [ \text{mpab} ] (C_k - 1)^2$$

$$+ \lambda_3 \sum_s \sum_k [ \text{temp} ] (C_k - 0)^2$$

$$+ \lambda_4 \sum_s \sum_k [ \text{mpab} ] L_{\text{class}}(k)$$