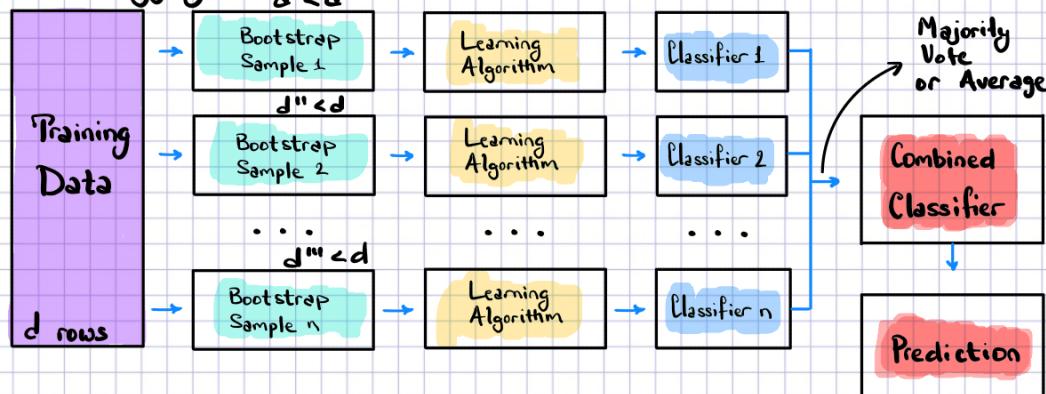


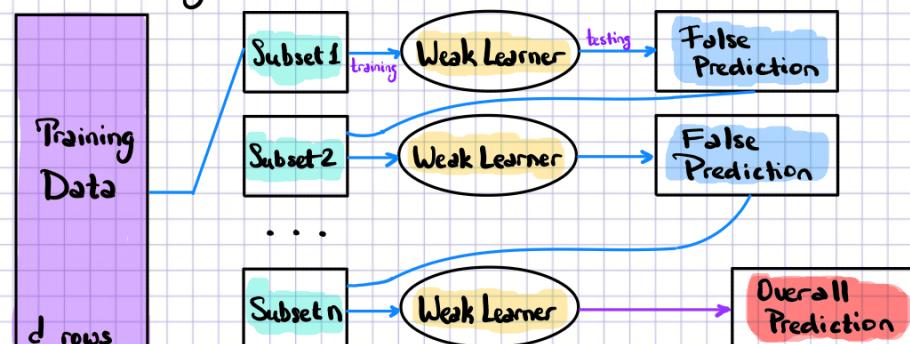
## Random Forest and ROC-AUC

## 1. Ensemble Techniques

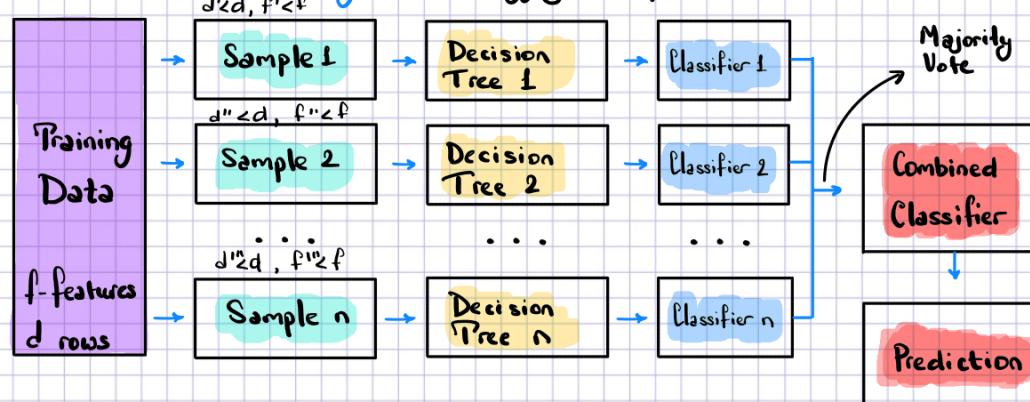
## 1.1 Bagging



## 1.2 Boosting



## 2. Random Forest Algorithm (Bagging technique used)

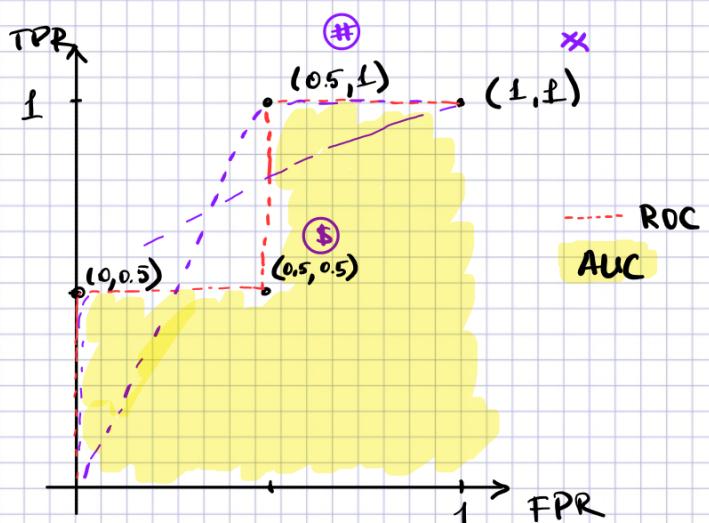


## 3. ROC-curve and AUC (Area under the curve)

## 3.1 TPR / FPR

$y_{\text{actual}}$	$\hat{y}_{\text{pred}}$	$\hat{y}(0)$	$\hat{y}(0.2)$	$\hat{y}(0.4)$	$\dots$
1	0.8	1	1	1	
0	0.96	1	1	1	
1	0.4	1	1	0	
1	0.3	1	1	0	
0	0.2	1	0	0	
1	0.7	1	1	1	
	TP=4 FP=2 TN=0 FN=0	TP=4 FP=1 TN=1 FN=0	TP=2 FP=1 TN=1 FN=2		
	$\text{TPR} = \frac{\text{TP}}{\text{TP} + \text{FN}} = \frac{4}{4+0} = 1$	$\frac{4}{4+0} = 1$	$\frac{4}{4+0} = 1$	$\frac{2}{2+2} = 0.5$	$\dots 0.5$
	$\text{FPR} = \frac{\text{FP}}{\text{FP} + \text{TN}} = \frac{2}{2+0} = 1$	$\frac{2}{2+0} = 1$	$\frac{1}{1+1} = 0.5$	$\frac{1}{1+1} = 0.5$	$\dots 0$

## 3.2 ROC-AUC



## 1. Types of Ensemble Techniques

## 1.1 Bagging

## 1.2 Boosting

## 2. Random Forest Algorithm

## 3. ROC-AUC

## 3.1 TPR / FPR

## 3.2 ROC-curve