SESSION 3 : BINARY CLASSIFICATION IN KERAS

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TOPICS TO BE COVERED TODAY

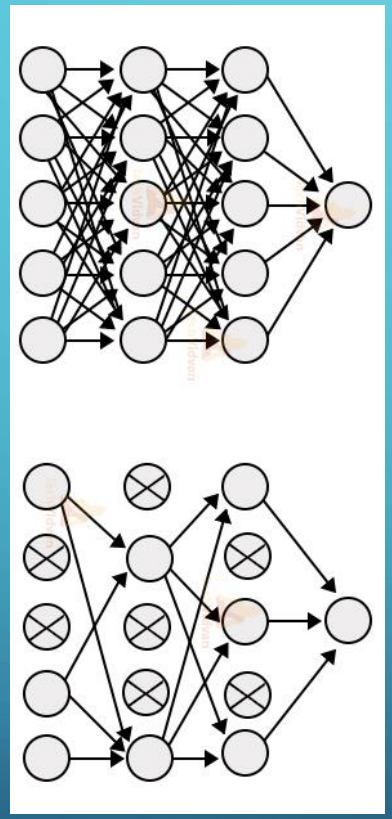
- Classification in keras
- Dropout layers

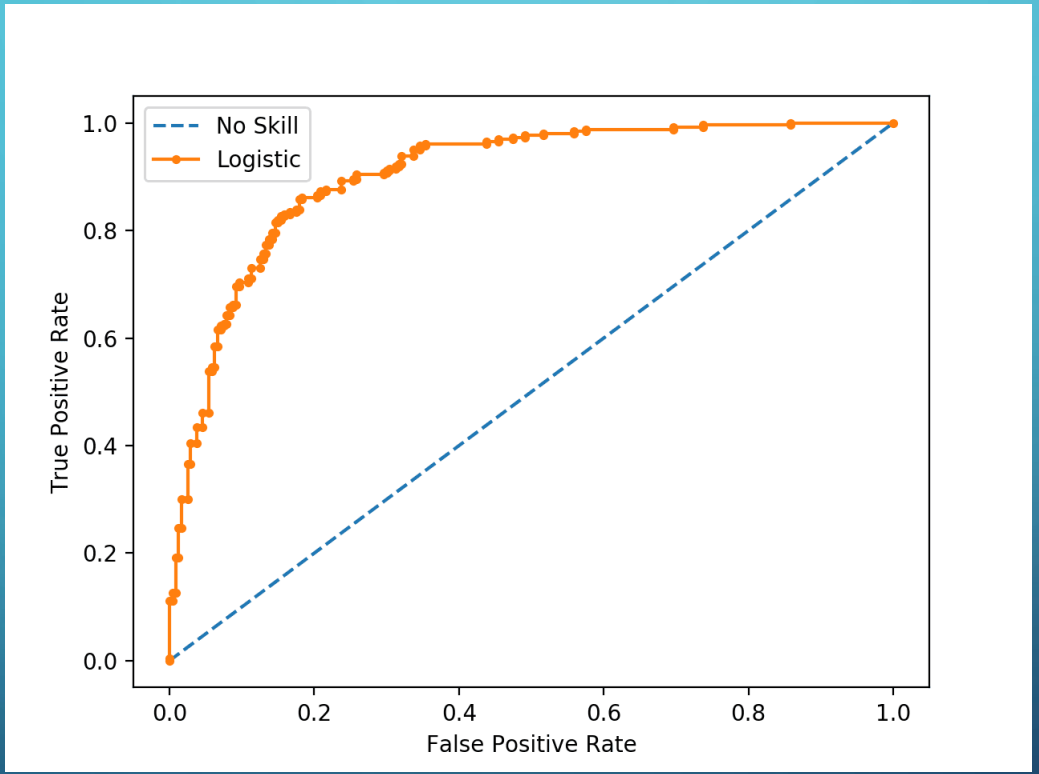
BINARY CROSS ENTROPY

$$\text{Loss} = -\frac{1}{\text{output size}} \sum_{i=1}^{\text{output size}} y_i \cdot \log \hat{y}_i + (1 - y_i) \cdot \log (1 - \hat{y}_i)$$

Actual	Predicted	Entropy	
0	0.6	0.916291	
1	0.9	0.105361	
0	0.2	0.223144	
0	0.1	0.105361	
0	0.3	0.356675	
1	0.9	0.105361	
1	0.8	0.223144	
1	0.7	0.356675	
	sum	2.392009	
	count	8	
	binary cross entropy		0.299001

DROPOUT LAYER IN KERAS




No Skill
Logistic
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0

METRICS USING CONFUSION MATRIX

		CONDITION determined by "Gold Standard"			
	TOTAL POPULATION	CONDITION POS	CONDITION NEG	PREVALENCE $\frac{\text{CONDITION POS}}{\text{TOTAL POPULATION}}$	
TEST OUT-COME	TEST POS	True Pos TP	*Type I Error* False Pos FP	*Precision* Pos Predictive Value PPV = $\frac{TP}{TEST\ P}$	False Discovery Rate FDR = $\frac{FP}{TEST\ P}$
	TEST NEG	*Type II Error* False Neg FN	True Neg TN	False Omission Rate FOR = $\frac{FN}{TEST\ N}$	Neg Predictive Value NPV = $\frac{TN}{TEST\ N}$
	ACCURACY ACC ACC = $\frac{TP + TN}{TOT\ POP}$	*Sensitivity (SN), Recall* Total Pos Rate TPR TPR = $\frac{TP}{CONDITION\ POS}$	*Fall-Out* False Pos Rate FPR FPR = $\frac{FP}{CONDITION\ NEG}$	Pos Likelihood Ratio LR + LR + = $\frac{TPR}{FPR}$	Diagnostic Odds Ratio DOR DOR = $\frac{LR+}{LR-}$
		Miss Rate False Neg Rate FNR FNR = $\frac{FN}{CONDITION\ POS}$	*Specificity (SPC)* True Neg Rate TNR TNR = $\frac{TN}{CONDITION\ NEG}$	Neg Likelihood Ratio LR - LR - = $\frac{TNR}{FNR}$	

THANK YOU

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