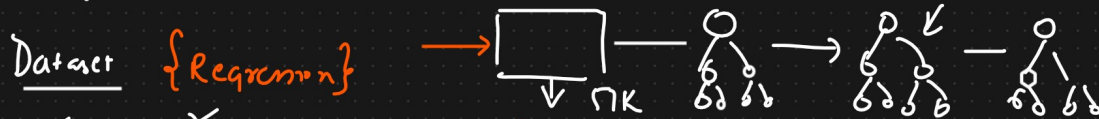


Xgboost Regressor Mh Algorithm



Exp	Gap	Salary	R_1	\hat{y}	R_2
2	Yes	40K	-11	49.9	-9.9
2.5	Yes	42K	-9	49.9	-7.9
3	No	52K	1	51.5	0.5
4	No	60K	9	51.5	8.5
4.5	Yes	62K	11	52.1	9.9

$$[51 + (0.1)(-10)] = 51 - 0.1 = 49.9$$

$$[51 + (0.1)(5)] = 51.5$$

$$[51 + 0.1(11)] = 51 + 1.1 = 52.1$$

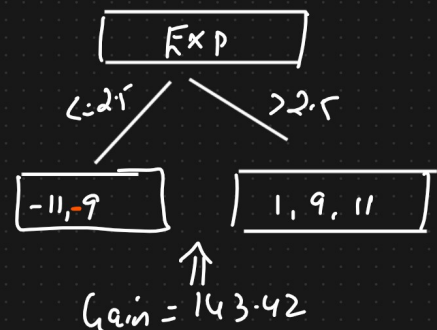
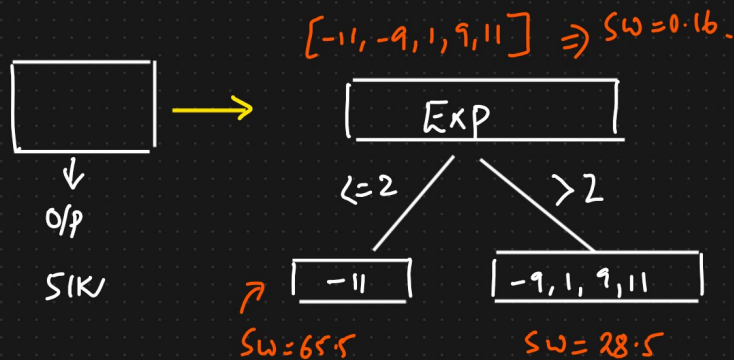
~ 51K

$$\text{Similarity weight} = \frac{\sum (\text{Residual})^2}{\sum p_r(1-p_r)}$$

Gain

Steps

- 1) Create a Base Model
- 2) Residual Computation
- 3) Construct DT1 using $\{x_i, R_i\}$



$$\text{Similarity weight} = \frac{\sum (\text{Residual})^2}{\sum p_r(1-p_r)}$$

$$\lambda = 1$$

No. of Residuals + $\lambda \rightarrow$ Hyperparameter

$$SW(\text{left child}) = \frac{121}{1+1}$$

$$= 121/2 = 60.5$$

$$\lambda \uparrow \quad SW \downarrow$$

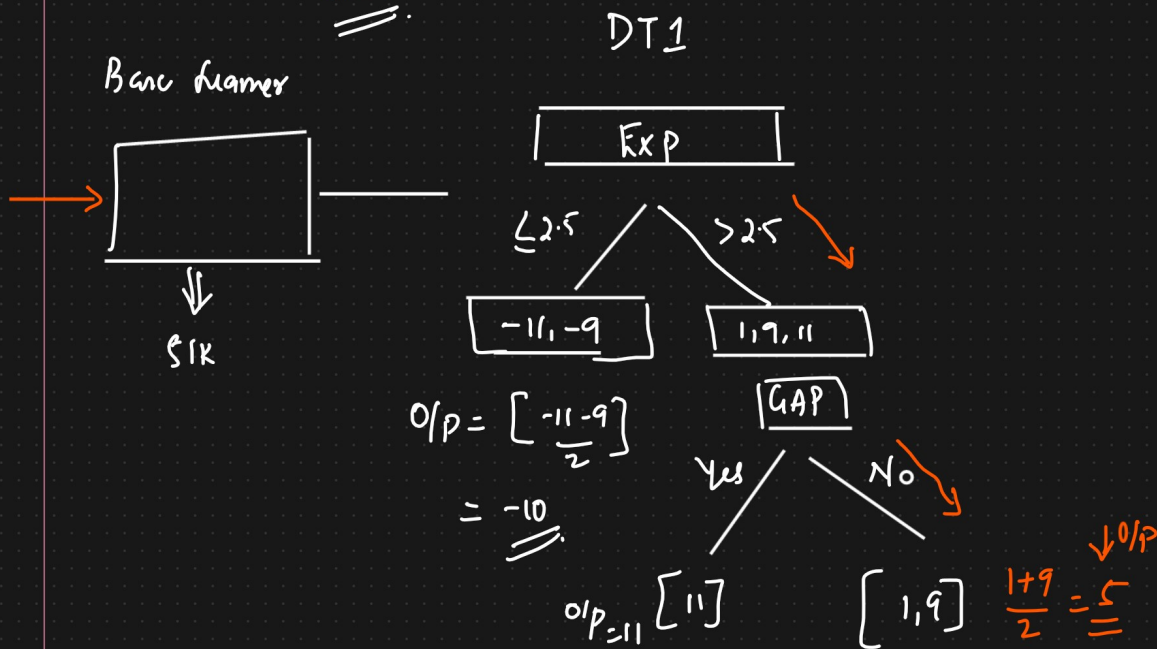
$$SW(\text{Right child}) = \frac{(-9+1+9+11)^2}{4+1}$$

$$= \frac{144}{5} = 28.5$$

⑤ Calculate Gain

$$\text{Gain} = 65.5 + 28.5 - 0.16$$

$$= 98.34$$



α = Learning Rate $\alpha = 0.1 \Rightarrow$ Hyperparameter

$$\text{XGBoost Classifier} = \text{Base learner} + \alpha_1 (\text{DT1}) + \alpha_2 (\text{DT2}) + \dots + \alpha_n (\text{DTn})$$

$$\text{XGBoost Regressor} = \overset{\text{O/P}}{51K} + 0.1(5)$$

$$= 51 + 0.5$$

$$= \underline{\underline{51.5}}$$

$$\text{Similarity Weight} = \frac{\sum (\text{Residual})^2}{\text{No. of Residuals} + \boxed{\lambda}}$$

{ Regression }

