$$M_0 + M_1 + M_2 + M_3 + \cdots + M_n$$

$$Y_{Pred} = \underbrace{\text{Base model}}_{\text{average value}} + DT_1 + DT_2 + DT_3 + \cdots + DT_n$$

leaf node

α — learning

$$\alpha = [0, 1]$$

iq	cgpa	Salary	Constr Prediction 1	Res1
90	8	3L	4.8	-1.8
100	7	4L	4.8	-0.8
110	6	8L	4.8	3.2
120	9	6L	4.8	1.2
80	5	3L	4.8	-1.8

(M_0) avg $= \frac{3+4+8+6+3}{5} = 4.8$

loss (Res) = (actual - Pred)

$= 3 - 4.8 =$

$= 4 - 4.8 =$

$= 8 - 4.8 =$

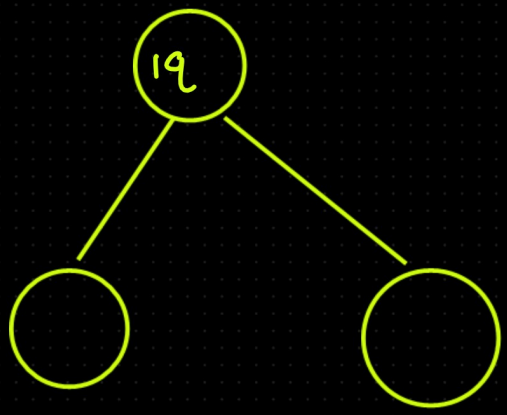
$= 6 - 4.8 =$

$M_1 = \{ iq, cgpa, Res1 \}$

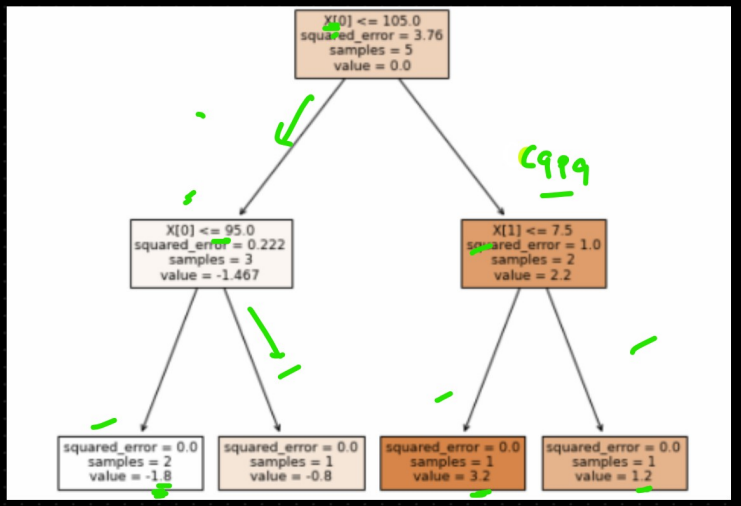
iq	cgpa	Salary	Prediction 1	Res 1	Prediction 2
90	8	3L	4.8	-1.8	-1.8
100	7	4L	4.8	-0.8	-0.8
110	6	8L	4.8	3.2	3.2
120	9	6L	4.8	1.2	1.2
80	5	3L	4.8	-1.8	-1.8

output

= 3 - 4.8 =



iq



{iq, cgpa, Res1}

target

training prediction = 100%

Actual	Predict 1	Prediction 2
3	4.8	-1.8
4	4.8	-0.8
8	4.8	3.2
6	4.8	1.2
3	4.8	-1.8

Overfitted

$$y_{pred} = M_0 + M_1 = 4.8 + (-1.8) = 3$$

$$= M_0 + \alpha M_1 \quad [0,1]$$

$$= M_0 + \alpha M_1 + \alpha M_2 + \alpha M_3 \ldots$$

slowly we are reaching to

our actual value

$= 4.8 + (-0.8) = 4 \approx$

$= 4.8 + (3.2) = 8 \approx$

$= 4.8 + (1.2) = 6 \approx$

$= 4.8 + (-1.8) = 3 \approx$

$4.8 + (0.1) \times (-1.8)$

$4.8 + (0.1) \times (-0.8)$

$4.8 + (0.1) \times (3.2)$

$4.8 + (0.1) \times (1.2)$

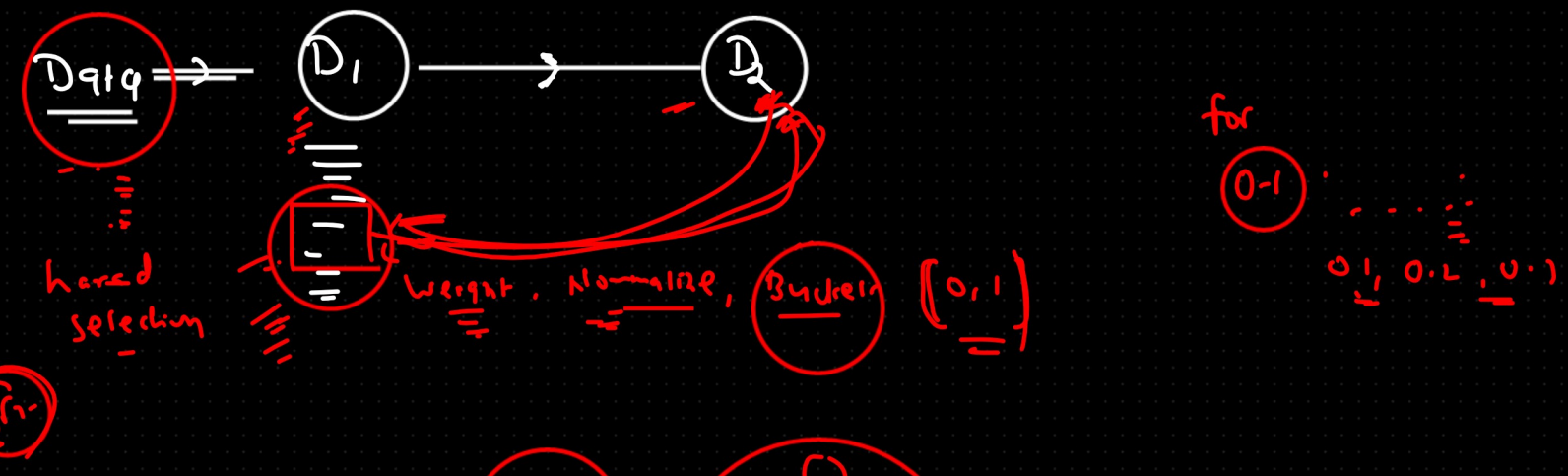
$4.8 + (0.1) \times (-1.8)$

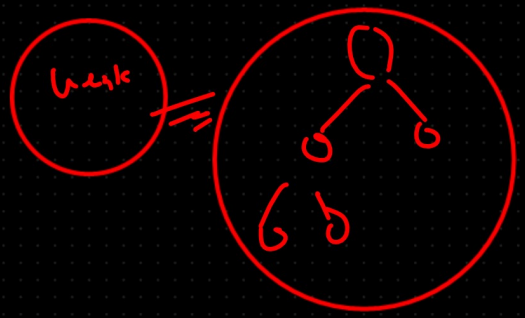
Residual 2 = (actual − (M0 + α M1))

Res2 = – – –

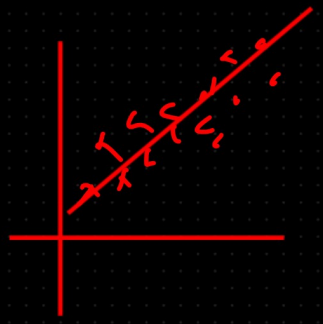
M_2

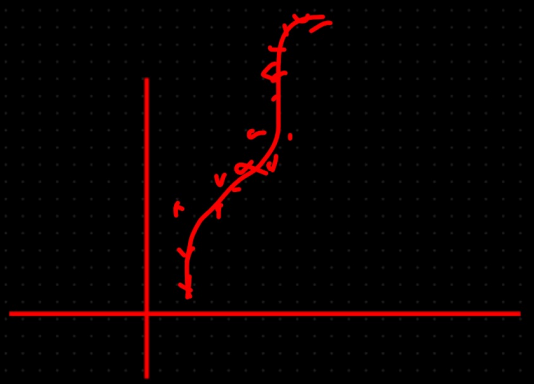
$= (\{19, \ldots\})(\{\text{Res2}\})$

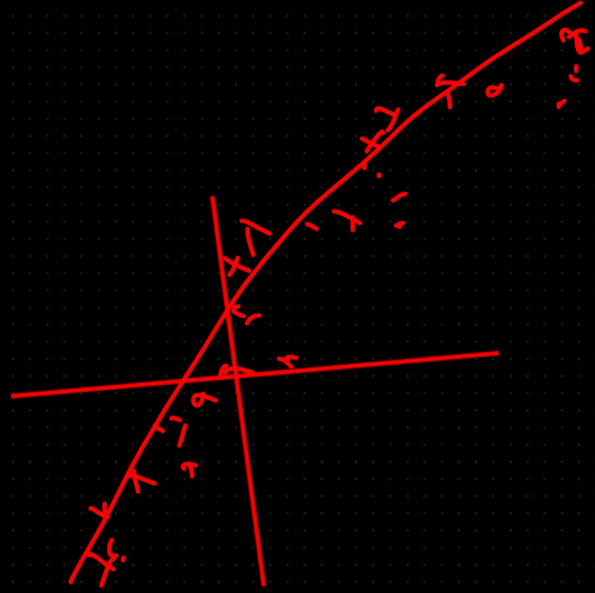




$h_1(\theta) + h_2(\theta) + h_3(\theta)$







$h_1(\theta) + h_1(\theta)$