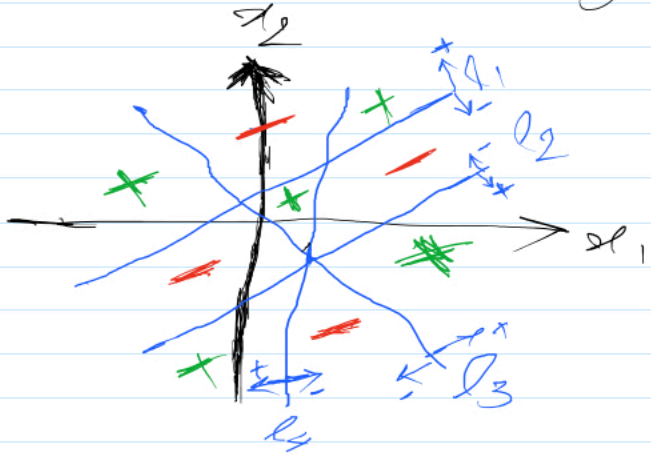
Assume the two classes of data as (+)s and (−)s. Find Minimum number of necessary conjunctions (AND, OR, etc) to correctly classify the regions (R_N) to implement a MLP.



Answer :

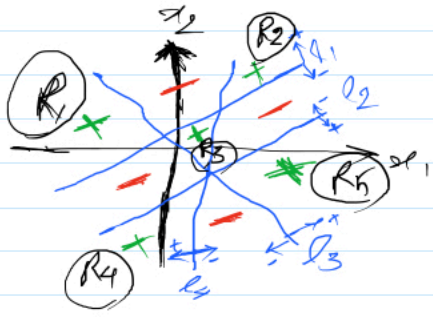
R_1: $h_1=+1, h_2=-1, h_3=-1, h_4=+1 \equiv AND(h_1, \bar{h}_2, \bar{h}_3, h_4)$

$R_2 = h_1=+1, h_2=-1, h_3=+1, h_4=-1 \equiv AND(h_1, \bar{h}_2, h_3, \bar{h}_4)$

$R_3 = h_1=-1, h_2=-1, h_3=+1, h_4=+1 \equiv AND(\bar{h}_1, \bar{h}_2, h_3, h_4)$

$R_4 = h_1=-1, h_2=+1, h_3=-1, h_4=+1 \equiv AND(\bar{h}_1, h_2, \bar{h}_3, h_4)$

$R_5 = h_1=-1, h_2=+1, h_3=+1, h_4=-1 \equiv AND(\bar{h}_1, h_2, h_3, \bar{h}_4)$



$y=+1$ if $X \in R_1 \cup R_2 \cup R_3 \cup R_4 \cup R_5 \Rightarrow OR(R_1, R_2, R_3, R_4, R_5)$

$\Rightarrow$ 3 layer Network