

Lab 8

Considering AdaBoost Algorithm for following sample data, show decision stump.

CGPA	Internship	Prev. Exam	Comp. skill	Job offer
>9	Yes	Good	Good	Yes
<9	No	Good	Moderate	Yes
>9	No	Average	Moderate	No
<9	No	Average	Good	No
>9	Yes	Good	Moderate	Yes
>9	Yes	Good	Moderate	Yes

Decision stump for CGPA

Initial weight $\geq 1/6$

CGPA	Predicted offer	Actual offer	Weight
>9	Yes	Yes	$1/6$
<9	No	Yes	$1/6$
>9	Yes	No	$1/6$
<9	No	No	$1/6$
>9	Yes	Yes	$1/6$
>9	Yes	Yes	$1/6$

Weighted error $\Rightarrow C = \text{no. of incorrect} \times \text{weight of incorrect}$
 $= 2 \times 1/6 = 0.333$

Weight of classifier $\alpha \Rightarrow \frac{1}{2} \ln\left(\frac{1}{1-C}\right)$
 $\Rightarrow 0.397$

normalizing formula (Z) = $\frac{w(t - \text{correct}) \times \text{no. of correct} + w(t - \text{wrong}) \times \text{no. of wrong} \times e^{-\alpha}}$

0.9428

update weight

$$w_{T+1} = \frac{w + \alpha \times e^{-\alpha}}{Z}$$

$$Z = \frac{1}{0.9428} \times e^{0.1249}$$

$$0.1 = 0.12501$$

Input	0.5	0.3	0.8	0.2
Actual	0.5	0.3	0.8	0.2
Predicted	0.5	0.3	0.8	0.2
off	Yes	No	Yes	No
Actual off	Yes	No	Yes	No
weight	0.1249	0.2501	0.2501	0.1249
> 9	0.5	0.3	0.8	0.2
< 9	0.5	0.3	0.8	0.2
> 9	0.5	0.3	0.8	0.2
< 9	0.5	0.3	0.8	0.2
> 9	0.5	0.3	0.8	0.2
< 9	0.5	0.3	0.8	0.2
> 9	0.5	0.3	0.8	0.2
< 9	0.5	0.3	0.8	0.2