Initialize: $D_1(i) = 1/m, \text{ for } i = 1, \ldots, m$

For t=1…T:

- Train base classifier $h_t(x)$ using D_t
- Choose α_t

$$\epsilon_t = \sum_{i=1}^{m} D_t(i)\delta(h_t(x^i) \neq y^i)$$

$$\alpha_t = \frac{1}{2}\ln\left(\frac{1-\epsilon_t}{\epsilon_t}\right)$$

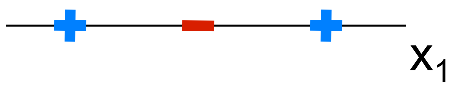
- Update, for i=1..m:

$$D_{t+1}(i) \propto D_t(i)\exp(-\alpha_t y^i h_t(x^i))$$

Output final classifier:

$$H(x) = \text{sign}\left(\sum_{i=1}^{T}\alpha_t h_t(x)\right)$$

x_1	y
-1	1
0	-1
1	1



- $D_3 = [D_3(1), D_3(2), D_3(3)] = [0.33,0.5,0.17]$

t=3:

- Train stub [work omitted; different stub because of new data weights D; breaking ties opportunistically (will discuss at end)]
  - $h_3(x)=+1$ if $x_1<-0.5$, -1 otherwise
- $\varepsilon_3=\Sigma_i D_3(i)\ \delta(h_3(x^i)\neq y^i)$
  $= 0.33\times0+0.5\times0+0.17\times1=0.17$
- $\alpha_3=(1/2)\ \ln((1-\varepsilon_3)/\varepsilon_3)=0.5\times\ln(4.88)= 0.79$

- Stop!!! How did we know to stop?

$H(x) = \text{sign}(0.35\times h_1(x)+0.55\times h_2(x)+0.79\times h_3(x))$

- $h_1(x)=+1$ if $x_1>0.5$, -1 otherwise
- $h_2(x)=+1$ if $x_1<1.5$, -1 otherwise
- $h_3(x)=+1$ if $x_1<-0.5$, -1 otherwise