Decision Trees Entropy Activity

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5) $-\left(\frac{6}{12}\log_2\frac{6}{12} + \frac{6}{12}\log_2\frac{6}{12}\right) = \boxed{1}$

6) If Friday is True:

Fri	Target Wait
T	T
T	F
T	F
T	F
T	T

$\text{entropy} = -\left(\frac{2}{5}\log_2\frac{2}{5} + \frac{3}{5}\log_2\frac{3}{5}\right) = \boxed{0.971}$

If Friday is False:

Fri	Target Wait
F	T
F	F
F	T
F	T
F	F
F	T
F	F

$\text{entropy} = -\left(\frac{4}{7}\log_2\frac{4}{7} + \frac{3}{7}\log_2\frac{3}{7}\right) = \boxed{0.985}$

7) $\frac{5}{12}\cdot 0.971 + \frac{7}{12}\cdot 0.985 = \boxed{0.979}$

on average, the entropy decreases $\boxed{0.0207}$ if we know Friday

8) when $\boxed{\text{Est} = >60}$, the target wait is always False (entropy = 0)

when $\boxed{\text{Type} = \text{French}}$, the target wait has 50% probability of becoming True and 50% becoming False (entropy = 1)

$\boxed{\text{Rain}}$ each True and False in Rain has an uniform distribution of becoming True and False in Target Wait