

$$H(Y|X) \approx \sum_{x \in X, y \in Y} P(x, y) \log_2 \left(\frac{P(x)}{P(x, y)} \right) \quad \boxed{\text{Slide 24}}$$

$$H(T|M=low) = H\left(\frac{1}{6}, \frac{4}{6}, \frac{1}{6}\right)$$

as we normalized over $M=low$

$$= \frac{1}{6} \cdot \log_2 \left(\frac{1}{1/6} \right) + \frac{4}{6} \log_2 \left(\frac{1}{4/6} \right)$$

$$+ \frac{1}{6} \log_2 \left(\frac{1}{1/6} \right)$$

$$= \frac{1}{6} \times 2.58 + \frac{4}{6} \times 0.58 + \frac{1}{6} \times 2.58$$

$$= 0.43 + 0.38 + 0.43$$

$$= 1.24 \leftarrow \text{calculation done by hand off by}$$

$$\text{||y } H(T|M=high) = 1.5$$

$$\approx 0.014$$

$$H(T|M) = \sum_m P(M=m) \cdot H(T|M=m)$$

$$= 0.6 \times 1.246 + 0.4 \times 1.5 \approx 1.35$$