

- Source random variable  $X \sim \{p_1, p_2, \dots, p_m\}$
- Expected length of  $\mathcal{C}$ :

$$L = \sum_i p_i l_i$$

- Intuitively, for a uniquely decodable code  $\mathcal{C}$ ,

$$H_D(X) \leq L$$

because each  $D$ -ary symbol can carry at most 1  $D$ -it of information.