



$$X_i = \begin{cases} 1 & 1/2, \text{ and } e \in D \\ -1 & 1/2, \text{ and } e \in A \end{cases}$$

$$S_n = \sum_{i=1}^n X_i \\ = D_n - A_n$$

$$S_n > 0 \text{ for } n \in D$$

$$S_n < 0 \text{ for } n \in A$$

$$S_n = 0 \text{ when } n \text{ is even}$$

$$\frac{S_n}{n} = \frac{D_n - A_n}{n} \xrightarrow{n \rightarrow \infty} 0$$

$$D_n + A_n = n$$

$$\Rightarrow \frac{D_n}{n} \xrightarrow{n \rightarrow \infty} 1/2$$

$$P(S_n = 0) \xrightarrow{n \rightarrow \infty} 0$$

$$\frac{D_n - A_n}{\sqrt{n}} \sim Z_n \xrightarrow{n \rightarrow \infty} N(0, 1)$$

$$\frac{S_n}{n} = \frac{1}{\sqrt{n}} \left(\frac{D_n - A_n}{\sqrt{n}} \right) = \frac{1}{\sqrt{n}} Z_n$$

$$\sqrt{n} Z_n = D_n - A_n$$