五 Scalar (dot) product of sequences

$$\langle x, y \rangle = \sum_{n=0}^{N-1} x[n]\, y^*[n]$$

复共轭

example

$x[n] = [0, j, 1]$ $\quad y[n] = [1, j, j]$

虚部共轭，故取反

$$\langle x, y \rangle = 0 \times 1 + j \times (-j) + 1 \times (-j)$$

$$= 1 - j$$

Orthogonality of sequences

$$x \perp y \Leftrightarrow \langle x, y \rangle = 0$$

example:

$x[n] = [2, 2]$; $y[n] = [2, -2]$

$$\langle x, y \rangle = 2 \times 2 + 2 \times -2 = 4 - 4 = 0$$