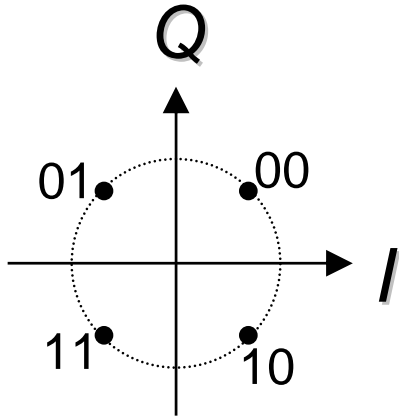
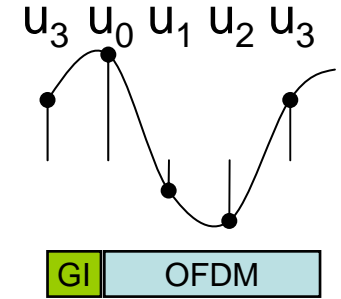
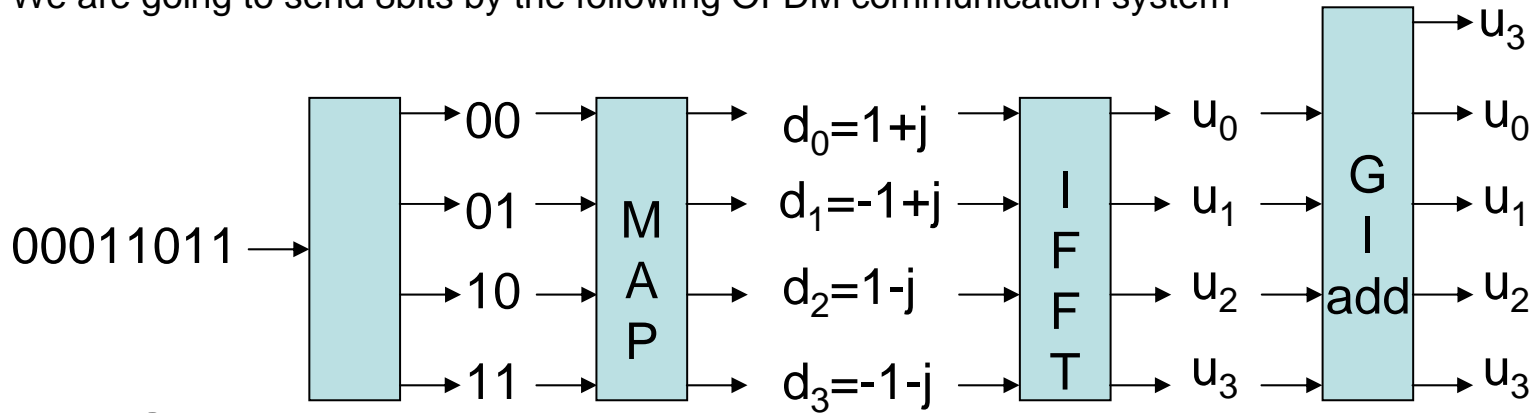


We are going to send 8bits by the following OFDM communication system



$$u_k = \frac{1}{4} \sum_{n=0}^3 d_n \cdot \left(e^{j \frac{2\pi}{4} nk} \right)^{nk} = \text{IFFT} (d_n) \quad (k = 0,1,2, \dots, 3)$$

$$u_0 = \frac{1}{4} (d_0 + d_1 + d_2 + d_3)$$

$$u_1 = \frac{1}{4} (d_0 + d_1 \cdot (j) + d_2 \cdot (-1) + d_3 \cdot (-j))$$

$$u_2 = \frac{1}{4} (d_0 + d_1 \cdot (-1) + d_2 + d_3 \cdot (-1))$$

$$u_3 = \frac{1}{4} (d_0 + d_1 \cdot (-j) + d_2 \cdot (-1) + d_3 \cdot (j))$$

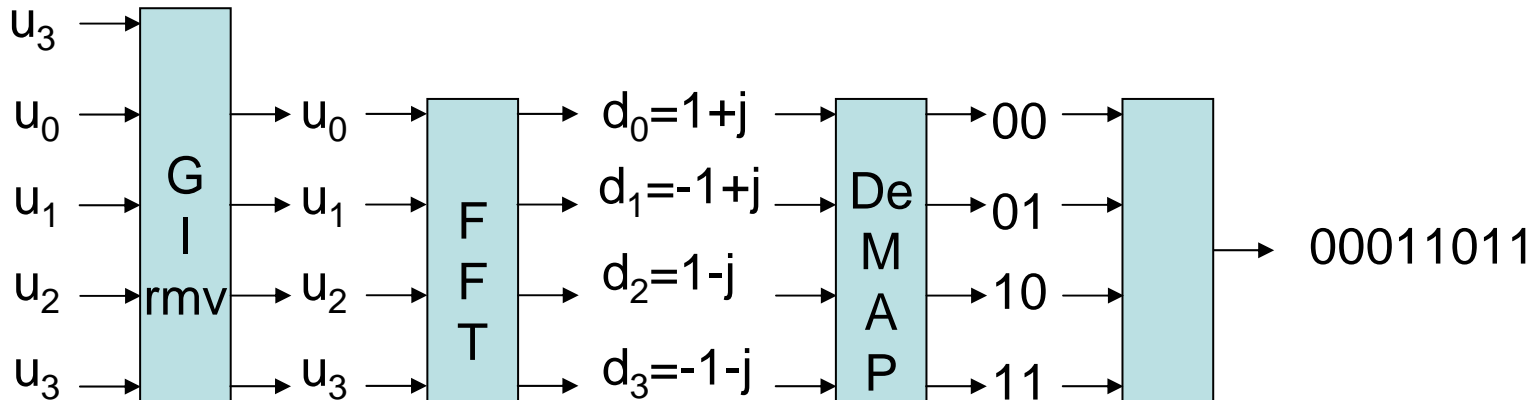
$$d_n = \sum_{k=0}^3 u_k \cdot \left(e^{-j \frac{2\pi}{4} nk} \right)^{nk} = \text{FFT} (u_k) \quad (n = 0,1,2, \dots, 3)$$

$$d_0 = u_0 + u_1 + u_2 + u_3$$

$$d_1 = u_0 + u_1 \cdot (-j) + u_2 \cdot (-1) + u_3 \cdot (+j)$$

$$d_2 = u_0 + u_1 \cdot (-1) + u_2 + u_3 \cdot (-1)$$

$$d_3 = u_0 + u_1 \cdot (j) + u_2 \cdot (-1) + u_3 \cdot (-j)$$



HW3

1. Please draw OFDM symbol complex wave form including GI when you send "10010011".
2. Please draw OFDM symbol complex wave form including GI when you send "00000000".
3. Compare those 2 waveform. Then Did you find any problem? If yes, please state the problem.

