DFT of $x(n)$ is given by

$$X(K) = \sum_{n=0}^{N-1} x(n) W \qquad N = 8 \qquad x(n) = \{4, 3, 2, 6, 8, 4, 6, 3\}$$

$$X(K) = \sum_{n=0}^{7} x(n) W_8^{nK}$$

Using direct calculation method

$$W_8^0 = 1 \quad W_8^1 = 0.707-0.707j \quad W_8^2 = -j \quad W_8^3 = -0.707-0.707j$$
$$W_8^4 = -1 \quad W_8^5 = -0.707+0.707j \quad W_8^6 = j \quad W_8^7 = 0.707+0.707j$$

$$X(0) = 4+3+2+6+8+4+6+3 = 36$$
$$X(1) = 4+3W_8^1+2W_8^2+6W_8^3+8W_8^4+4W_8^5+6W_8^6+3W_8^7 = -6.82+2.58j$$
$$X(2) = 4+3W_8^2+2W_8^4+6W_8^6+8W_8^8+4W_8^{10}+6W_8^{12}+3W_8^{14} = 4+2j$$
$$X(3) = 4+3W_8^3+2W_8^6+6W_8^9+8W_8^{12}+4W_8^{15}+6W_8^{18}+3W_8^{21} = -1.17-5.41j$$
$$X(4) = 4+3W_8^4+2W_8^8+6W_8^{12}+8W_8^{16}+4W_8^{20}+6W_8^{24}+3W_8^{28} = 4$$
$$X(5) = -1.17+5.41j = X^*(3) \quad \text{(Conjugate Symmetry Property)}$$
$$X(6) = 4-2j = X^*(2)$$
$$X(7) = -6.82-2.58j = X^*(1)$$

$$X(K) = \{36, -6.82+2.58j, 4+2j, -1.17-5.41j, 4, -1.17+5.41j, 4-2j, -6.82-2.58j\}$$

Same in matlab

IDFT

$$X(K) = \sum_{n=0}^{N-1} x(n) W_N^{nK} \times \frac{1}{N} \qquad N = 8$$

IDFT using DFT

$$x(n) = \left\{ \sum_{K=0}^{N-1} X^*(K)\, W_N^{Kn} \right\}^*$$

$X(K) = \{36, -6.82+2.58j, 4+2j, -1.17-5.41j, 4,$
$-1.17+5.41j, 4-2j, -6.82-2.58j\}$

$X^*(K) = \{36, -6.82-2.58j, 4-2j, -1.17+5.41j, 4,$
$-1.17-5.41j, 4+2j, -6.82+2.58j\}$

$x(0) = 36 - 6.82 - 2.58j + 4 - 2j - 1.17 + 5.41j + 4 - 1.17 - 5.41j + 4 + 2j - 6.82 + 2.58j = 4$

$x(1) = 36 + (-6.82-2.58j)W_8^1 + (4-2j)W_8^2 + (-1.17+5.41j)W_8^3 + (4)W_8^4 + (-1.17-5.41j)W_8^5 + (4+2j)W_8^6 + (-6.82+2.58j)W_8^7 = 3$

$x(2) = 36 + (-6.82-2.58j)W_8^2 + (4-2j)W_8^4 + (-1.17+5.41j)W_8^6 + (4)W_8^8 + (-1.17-5.41j)W_8^{10} + (4+2j)W_8^{12} + (-6.82+2.58j)W_8^{14} = 2$

$x(3) = 36 + (-6.82-2.58j)W_8^3 + (4-2j)W_8^6 + (-1.17+5.41j)W_8^9 + (4)W_8^{12} + (-1.17-5.41j)W_8^{15} + (4+2j)W_8^{18} + (-6.82+2.58j)W_8^{21} = 6$

$x(4) = 36 + (-6.82-2.58j)W_8^4 + (4-2j)W_8^8 + (-1.17+5.41j)W_8^{12} + (4)W_8^{16} + (-1.17-5.41j)W_8^{20} + (4+2j)W_8^{24} + (-6.82+2.58j)W_8^{28} = 8$

$x(5) = 36 + (-6.82-2.58j)W_8^5 + (4-2j)W_8^{10} + (-1.17+5.41j)W_8^{15} + (4)W_8^{20} + (-1.17-5.41j)W_8^{25} + (4+2j)W_8^{30} + (-6.82+2.58j)W_8^{35} = 4$

Same

$$x(6) = 36 + (-6.82-2.58j)W_8^{6} + (4-2j)W_8^{12} + (-1.17+5.41j)W_8^{18} + (4)W_8^{24} + (-1.17-5.41j)W_8^{30} + (4+2j)W_8^{36} + (-6.82+2.58j)W_8^{42} = 6$$

$$x(7) = 36 + (-6.82-2.58j)W_8^{7} + (4-2j)W_8^{14} + (-1.17+5.41j)W_8^{21} + (4)W_8^{28} + (-1.17-5.41j)W_8^{35} + (4+2j)W_8^{42} + (-6.82+2.58j)W_8^{49} = 3$$

$$x(n) = \{4,\ 3,\ 2,\ 6,\ 8,\ 4,\ 6,\ 2\}$$
$$\uparrow$$

DTFT

$$X(e^{j\Omega}) = \sum_{n=-\infty}^{\infty} x(n)e^{-j\Omega n}$$

$$= \sum_{n=0}^{7} x(n)e^{-j\Omega n}$$

$$= x(0) + x(1)e^{-j\Omega} + x(2)e^{-2j\Omega} + x(3)e^{-3j\Omega} + x(4)e^{-4j\Omega} + x(5)e^{-5j\Omega} + x(6)e^{-6j\Omega} + x(7)e^{-7j\Omega}.$$