HW3

-CH.6 과제-

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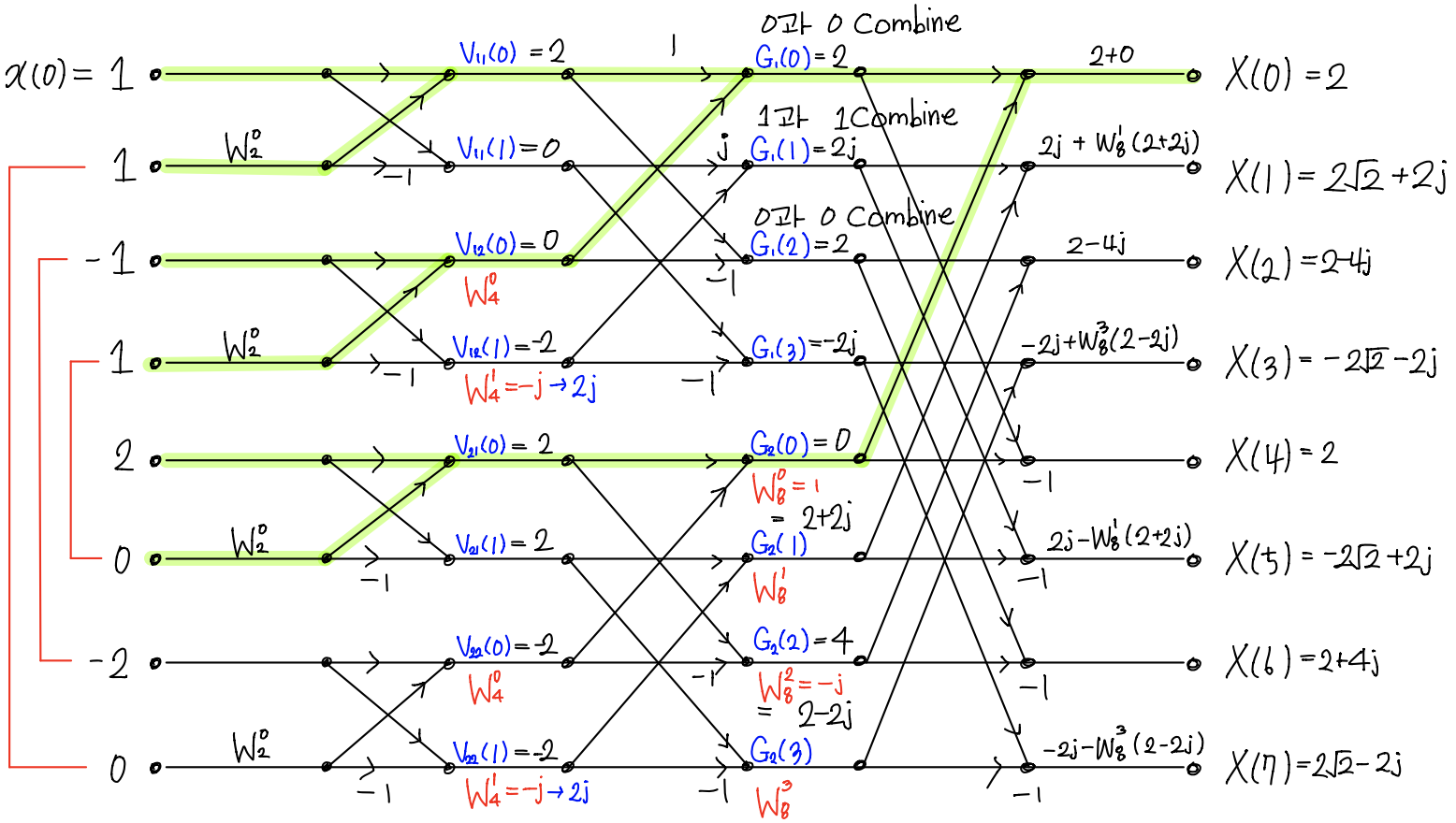
1.

$X(K) = G_1(K) + W_N^K G_2(K)$

$X(K+\frac{N}{2}) = G_1(K) - W_N^K G_2(K)$

$*W_8^1 = e^{-j\frac{2\pi}{8}} = e^{-\frac{\pi}{4}j} = \cos(\frac{\pi}{4}) - j\sin(\frac{\pi}{4}) = \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}j$

$*W_8^3 = e^{-j\frac{2\pi}{8}\cdot 3} = e^{-\frac{3\pi}{4}j} = -\sin(\frac{\pi}{4}) - j\cos(\frac{\pi}{4}) = -\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}j$



2.

2-1)

$L_x = 18 \quad L_H = 3 \quad x(n) = \{1, -1, 1, -1 \cdots, 1, -1\}$

	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1
1	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1
−1	−1 1	−1 1	−1 1	−1 1	−1 1	−1 1	−1 1	−1 1	−1 1
1	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1	1 −1

$y(n) = \{1, -2, 3, -3, \cdots, 3, -3, 2, -1\}$ → 20개

2-2)

$x_0(n) = \{\overset{\text{new}}{1,-1,1,-1,0,0}\} = \cdots = x_3(n)$

$\hookrightarrow y_0(n) = \cdots = y_3(n) = \{1,-2,3,-3,2,-1\}$

$x_4(n) = \{\overset{\text{new}}{1,-1,0,0,0,0}\} \longrightarrow y_4(n) = \{1,-2,2,-1,0,0\}$

2개

$y_0(n) = 1,-2,3,-3,\boxed{2,-1}$

$y_1(n) = \quad\quad 1,-2,3,-3,\boxed{2,-1}$

$y_2(n) = \quad\quad\quad\quad 1,-2,3,-3,\boxed{2,-1}$

$y_3(n) = \quad\quad\quad\quad\quad\quad 1,-2,3,-3,\boxed{2,-1}$

$+\ y_4(n) = \quad\quad\quad\quad\quad\quad\quad\quad 1,-2,2,-1$

$y(n) = \{1,-2,3,-3,\cdots,3,-3,2,-1\}$

	1	-1	1	-1	0	0
1	1	-1	1	-1	0	0
-1	-1	1	-1	1	0	0
1	1	-1	1	-1	0	0

	1	-1	0	0	0	0
1	1	-1	0	0	0	0
-1	-1	1	0	0	0	0
1	1	-1	0	0	0	0

2-3)

$x_0(n) = \{0,0,\overset{\text{new}}{1,-1,1,-1}\} \longrightarrow y_0(n) = \{\cancel{0,0,}\boxed{1,-2,3,-3}\}$

$x_1(n) = \{1,-1,1,-1,1,-1\}$ (copy)

$x_2(n) = \{1,-1,1,-1,1,-1\}$

$x_3(n) = \{1,-1,1,-1,1,-1\}$

$\longrightarrow y_1(n) = \cdots = y_3(n) = \{\cancel{1,-2,}\boxed{3,-3,3,-3}\}$

$x_4(n) = \{1,-1,1,-1,0,0\} \longrightarrow y_4(n) = \{\cancel{1,-2,}2,-1,0,0\}$

$y(n) = \{1,-2,3,-3,\cdots,3,-3,2,-1\}$ 2개

	0	0	1	-1	1	-1
1	0	0	1	-1	1	-1
-1	0	0	-1	1	-1	1
1	0	0	1	-1	1	-1

	1	-1	1	-1	1	-1
1	1	-1	1	-1	1	-1
-1	-1	1	-1	1	-1	1
1	1	-1	1	-1	1	-1