

DL PW 8 Ex 1

a)

$$-S = -1, \quad P = 0$$

$$\begin{array}{c} \uparrow \\ 1 \cdot 2 + 3 \cdot 1 + (-2) \cdot (-1) + 2 = 9 \end{array}$$

$$2 \cdot 3 + 1 \cdot (-2) + (-1) \cdot 0 + 2 = 6$$

$$(-2) \cdot 2 + 0 + (-1) \cdot 2 + 2 = -4$$

$$0 + 1 \cdot 2 + (-1) \cdot (-1) + 2 = 5$$

$$2 \cdot 2 + (-1) + (-3) + 2 = 2$$

$$(-1) \cdot 2 + 3 + (-1) + 2 = 2$$

$$6 + 1 - 2 + 2 = 7$$

$$-S = 2, \quad P = 0$$

$$\boxed{1 \mid 2 \mid -2 \mid 0 \mid 2 \mid -1 \mid 3 \mid 1 \mid 2} \quad \text{Bias}$$

$$\boxed{2 \mid 1 \mid -1} + 2 = 9$$

$$\boxed{2 \mid 1 \mid -1} + 2 = -4$$

$$\boxed{2 \mid 1 \mid -1} + 2 = 2$$

$$\boxed{2 \mid 1 \mid -1} + 2 = 7$$

$$-S = 4, \quad P = 0$$

$$\underline{9}, \quad \underline{2}$$

$$-S = 1, \quad P = 1$$

$$\boxed{0 \mid 1 \mid 3 \mid -2 \mid 0 \mid 2 \mid -1 \mid 3 \mid 1 \mid 2 \mid 0} \quad \text{Bias}$$

$$\boxed{2 \mid 1 \mid -1} + 2 = 0$$

Then: 9, 6, -4, 5, 2, 2, 7

$$\boxed{2 \mid 1 \mid -1} + 2 = \underline{6}$$

$$-S = 4, \quad P = 1$$

$$0, \quad 5, \quad 6$$

5)

→

→ We have 2 Filters \Rightarrow 2 activation maps

→ $S=1$, $P=0$. Output Volume will be $3 \times 3 \times 2$
with $O_w = \frac{4-2+0}{1} + 1$

$$O_H = \frac{4-2+0}{1} + 1$$

And 2 Filters

→ With the same formulas but $S=2$:

$$O_w = \frac{4-2+0}{2} + 1 = 2$$

$$O_H = \frac{4-2+0}{2} + 1 = 2$$

\Rightarrow ~~2~~ Filters \Rightarrow $2 \times 2 \times 2$ Output volume

→ This means we need $O_w = O_H = 4$.

Possible i.e. with $S=2$, $P=2$

$$\Rightarrow O_w = \frac{4-2+4}{2} + 1 = \frac{6}{2} + 1 = 4 = O_H$$