

625-680 HW2 solution

$$\boxed{1} \quad (1) \neg P(x) \rightarrow [Q(x,y) \vee R(y)]$$

$$\Leftrightarrow P(x) \vee Q(x,y) \vee R(y)$$

$$(2) \neg P(A)$$

$$(3) \neg Q(w,z) \vee R(w)$$

$$(4) \neg R(A) \quad : \text{negated conclusion}$$

$$(5) Q(A,y) \vee R(y) \quad \{x/A\} \quad (1,2)$$

$$(6) Q(A,A) \quad \{y/A\} \quad (4,5)$$

$$(7) R(A) \quad \{w/A, z/A\} \quad (3,6)$$

$$(8) \boxed{\text{False}} \quad (4,7)$$

$$\boxed{2} \quad P(\neg J \wedge \neg M \wedge A \wedge \neg E \wedge B)$$

$$= P(\neg J|A) P(\neg M|A) P(A|\neg E \wedge B) \\ P(\neg E) P(B)$$

$$= 0.9 \times (1-0.7) \times 0.94 \times 0.998 \\ \times 0.001 = \boxed{0.000253...}$$

Σ

Reliability

+	1, 2, 5, 8, 9
-	3, 4, 6, 7, 10

1 year

1 month

BSD

+	1, 8, 9
-	

+	2, 5,
-	4, 6

+	
-	3, 7, 10

= Yes

= No

Interface

Ok

Util

Fancy

+	1, 9
-	7

+	2, 8
-	6

+	5,
-	3, 4, 10

Portability

Desktop

Slim

Debugger

+	1, 9
-	3, 7

+	2, 5
-	10

+	8
-	4, 6

4 • Reliability :

$$= \left(-\frac{5}{10} \log_2 \frac{5}{10} - \frac{5}{10} \log_2 \frac{5}{10} \right) - \left[\frac{3}{10} \left(-\frac{3}{3} \log_2 \frac{3}{3} - \frac{0}{3} \log_2 \frac{0}{3} \right) + \frac{4}{10} \left(-\frac{2}{4} \log_2 \frac{2}{4} - \frac{2}{4} \log_2 \frac{2}{4} \right) + \frac{3}{10} \left(-\frac{0}{3} \log_2 \frac{0}{3} - \frac{3}{3} \log_2 \frac{3}{3} \right) \right] = 0.6$$

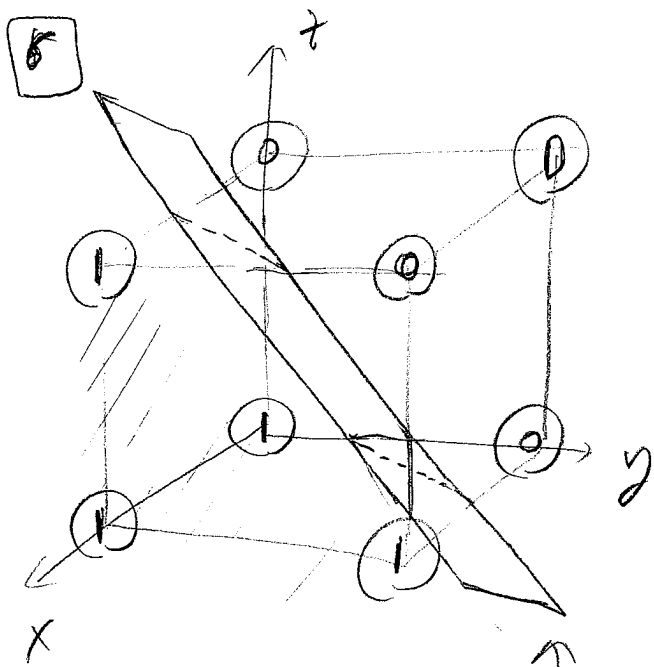
• Interface

$$= \left(-\frac{5}{10} \log_2 \frac{5}{10} - \frac{5}{10} \log_2 \frac{5}{10} \right) - \left[\frac{3}{10} \left(-\frac{2}{3} \log_2 \frac{2}{3} - \frac{1}{3} \log_2 \frac{1}{3} \right) + \frac{3}{10} \left(-\frac{2}{3} \log_2 \frac{2}{3} - \frac{1}{3} \log_2 \frac{1}{3} \right) + \frac{4}{10} \left(-\frac{1}{4} \log_2 \frac{1}{4} - \frac{3}{4} \log_2 \frac{3}{4} \right) \right] = 0.1245$$

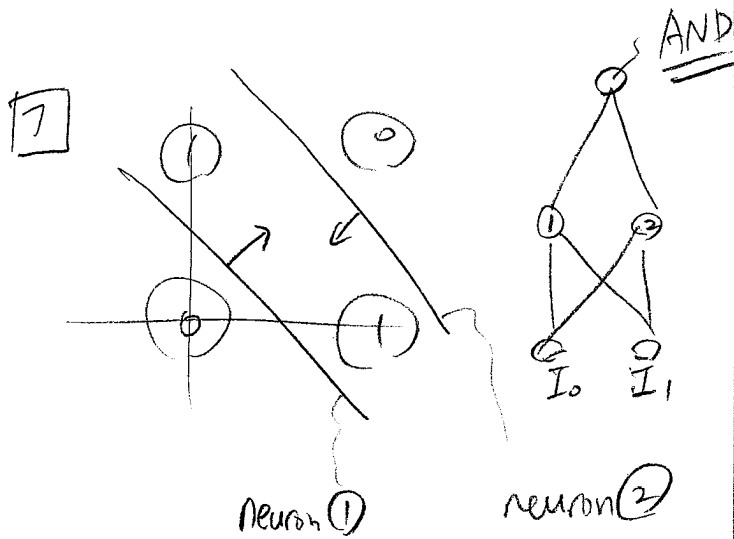
• Portability

$$= \left(-\frac{5}{10} \log_2 \frac{5}{10} - \frac{5}{10} \log_2 \frac{5}{10} \right) - \left[\frac{4}{10} \left(-\frac{2}{4} \log_2 \frac{2}{4} - \frac{2}{4} \log_2 \frac{2}{4} \right) + \frac{3}{10} \left(-\frac{2}{3} \log_2 \frac{2}{3} - \frac{1}{3} \log_2 \frac{1}{3} \right) + \frac{3}{10} \left(-\frac{1}{3} \log_2 \frac{1}{3} - \frac{2}{3} \log_2 \frac{2}{3} \right) \right] = 0.049$$

5 Reliability, since it has max info gain.



(1) (2)



- 8
- ① quantization error
 - ② topographic error

① → encoding

② → feature mapping