

assignment 4

1. ① $AB + A(CD + C\bar{D})$

$$AB + ACD + AC\bar{D}$$

$$AB + AC(D + \bar{D}) = AB + AC$$

② $(B\bar{C} + \bar{A}B)(A\bar{B} + C\bar{D})$

$$A\bar{B}B\bar{C} + B\bar{C}C\bar{D} + \bar{A}A\bar{B}\bar{D} + \bar{A}C\bar{D}\bar{D}$$

$$0 + 0 + 0 + 0 = \text{zero}$$

2. ① $(\bar{A} + B)(\bar{A} + \bar{B})$

$$(\bar{A}\bar{B}) + (AB) = 0$$

② $A + \bar{A}B + \bar{A}\bar{B}$

$$A + \bar{A}(B + \bar{B})$$

$$= A + \bar{A} = 1$$

3. $F = \bar{X}Y + X\bar{Y}\bar{Z}$

① $\bar{X}Y + X\bar{Y}\bar{Z} = (X + \bar{Y})(\bar{Y} + \bar{Y} + Z)$

② $(\bar{X}Y + X\bar{Y}\bar{Z}) \cdot ((X + \bar{Y})(\bar{Y} + \bar{Y} + Z)) = \text{zero}$

③ $F + \bar{F} = 1$

$$\bar{X}Y + X\bar{Y}\bar{Z} + (X + \bar{Y})(\bar{Y} + \bar{Y} + Z)$$

$$\bar{X}Y + X\bar{Y}\bar{Z} + X\bar{X} + X\bar{Y} + XZ + \bar{Y}\bar{X} + \bar{Y}\bar{Y} + \bar{Y}Z$$

$$Y(\bar{X} + X\bar{Z}) + X\bar{Y} + XZ + \bar{Y}\bar{X} + \bar{Y} + \bar{Y}Z$$

$$Y(\bar{X} + \bar{Z}) + X\bar{Y} + XZ + \bar{Y}\bar{X} + \bar{Y} + \bar{Y}Z$$

$$Y(\bar{X} + \bar{Z}) + XZ + \bar{X}\bar{Y} + \bar{Y} + \bar{Y}Z$$

$$Y(\bar{X} + \bar{Z}) + XZ + \bar{Y}$$

$$\bar{X} + \bar{Z} + XZ + \bar{Y}$$

$$\bar{X} + \bar{Z} + Z + \bar{Y}$$

$$\bar{X} + \bar{Y} + 1$$

$$= 1$$

$$m_1 \rightarrow m_0 + m_1 + m_2$$

$$\bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + \bar{A}B\bar{C}$$

$$\bar{A}\bar{B}(C+\bar{C}) + \bar{A}B\bar{C}$$

$$\bar{A}(\bar{B}+B\bar{C})$$

$$\bar{A}(\bar{B}+\bar{C})$$

$$m_2 = m_3 + m_4 + m_5 + m_6 + m_7$$

$$A\bar{B}\bar{C} + A\bar{B}C + A\bar{B}\bar{C} + A\bar{B}C + A\bar{B}\bar{C}$$

$$A\bar{B}\bar{C} + A\bar{B}C(C+\bar{C}) + A\bar{B}(C+\bar{C})$$

$$A\bar{B}\bar{C} + A(\bar{B}+B)$$

$$A\bar{B}\bar{C} + A$$

⑤	A	B	C	F ₁	F ₂
	0	0	0	1	1
	0	0	1	0	1
	0	1	0	1	0
	0	1	1	1	1
	1	0	0	1	0
	1	0	1	0	1
	1	1	0	1	0

$$F_1 = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + \bar{A}B\bar{C} + \bar{A}BC$$

$$\bar{A}\bar{B}(\bar{C}+C) + \bar{A}B(\bar{C}+C) + \bar{A}B\bar{C}$$

$$\bar{A}\bar{B} + \bar{A}B + \bar{A}B\bar{C}$$

$$\bar{A}\bar{C}(\bar{B}+B) + \bar{A}B\bar{C} + \bar{A}B\bar{C} + \bar{A}B\bar{C}$$

$$\bar{A}\bar{C} + \bar{A}B\bar{C} + \bar{A}B\bar{C} + \bar{A}B\bar{C}$$

$$\bar{A}(\bar{C}+C) + \bar{A}B\bar{C} + \bar{A}B\bar{C}$$

$$\bar{A}(\bar{B}+\bar{C}) + \bar{A}B\bar{C} + \bar{A}B\bar{C}$$

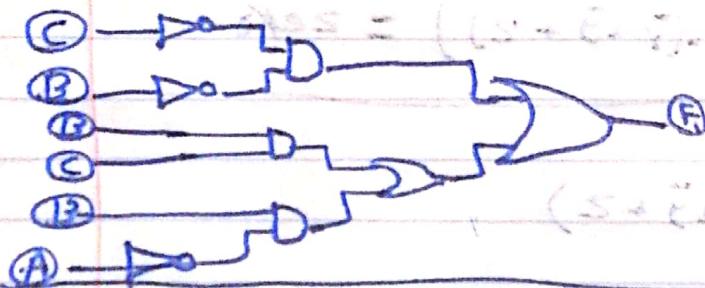
$$\bar{A}\bar{B} + \bar{A}\bar{C} + \bar{A}B\bar{C} + \bar{A}B\bar{C}$$

$$\bar{A}\bar{B} + \bar{C}(\bar{B}+\bar{A}) + \bar{A}B\bar{C}$$

$$\bar{C}(\bar{B}+\bar{A}) + \bar{B}(\bar{A}C + \bar{A})$$

$$\bar{C}\bar{B} + \bar{C}\bar{A} + \bar{B}\bar{C} + \bar{B}\bar{A}$$

$$\bar{C}\bar{B} + \bar{B}\bar{C} + \bar{B}\bar{A}$$



$$F_2 = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + \bar{A}B\bar{C} = \bar{A}\bar{B}(C+\bar{C}) + \bar{A}C(\bar{B}+B) + \bar{B}C(\bar{A}+\bar{A})$$

$$= \bar{A}\bar{B} + \bar{A}C + \bar{B}C$$

