

| | | | | |
|----|----|----|----|----|
| ab | 00 | 01 | 11 | 10 |
| cd | | | | |
| 00 | 0 | 0 | 1 | 0 |
| 01 | 0 | 0 | 1 | 0 |
| 11 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 1 | 0 |

| | | | | |
|----|----|----|----|----|
| ab | 00 | 01 | 11 | 10 |
| cd | | | | |
| 00 | 0 | 0 | 1 | 0 |
| 01 | 0 | 0 | 1 | 0 |
| 11 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 1 | 0 |

$$S = ab\bar{c} + ab\bar{d}$$

$$\bar{S} = \bar{a} + \bar{b} + cd \quad S = ab(\bar{c} + \bar{d})$$

$$\text{NAND : } S = \overline{\overline{ab\bar{c}} + \overline{ab\bar{d}}}$$

$$\text{NOR : } S = \overline{\bar{a} + \bar{b} + (\bar{c} + \bar{d})}$$

