

Laboratorio #4

• Problema #1:

• Tabla 01:

| A | B | C | Y |
|---|---|---|---|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 |

| Y C | AB | 00 | 01 | 11 | 10 |
|--------|----|----|----|----|----|
| 0 | | 1 | 1 | 0 | 1 |
| 1 | | 0 | 0 | 1 | 1 |

| | | | | | |
|---|----|-------------------------|-------------------|-------------------|-------------|
| | AB | 00 | 01 | 11 | 10 |
| C | | | | | |
| 0 | | $\bar{A}\bar{B}\bar{C}$ | $\bar{A}B\bar{C}$ | $A\bar{B}\bar{C}$ | $A\bar{B}C$ |
| 1 | | $\bar{A}BC$ | $A\bar{B}C$ | ABC | $AB\bar{C}$ |

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

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

• Tabla 02:

| A | B | C | Y |
|---|---|---|---|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | X |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | X |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 0 |

| $\Delta\phi$ | 00 | 01 | 11 | 10 |
|--------------|----|----|----|----|
| 0 | 1 | 0 | 0 | X |
| 1 | X | 0 | 0 | 1 |

| | 00 | 01 | 11 | 10 |
|---|-------------------------|-------------------|-------------|-------------------|
| 0 | $\bar{A}\bar{B}\bar{C}$ | $\bar{A}B\bar{C}$ | $AB\bar{C}$ | $A\bar{B}\bar{C}$ |
| 1 | $\bar{A}BC$ | $A\bar{B}C$ | ABC | $AB\bar{C}$ |

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

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

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

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

$$Y = \bar{B}$$

→ con vertical

→ con esquinas

→ con unidades

• Table 03:

| A | B | C | D | Y |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 1 |
| 0 | 1 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 1 |
| 1 | 0 | 1 | 0 | 1 |
| 1 | 0 | 1 | 1 | 0 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 0 |
| 1 | 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 |

| Y \ AB | 00 | 01 | 11 | 10 |
|--------|----|----|----|----|
| 00 | 1 | 0 | 1 | 0 |
| 01 | 0 | 1 | 0 | 1 |
| 11 | 1 | 0 | 1 | 0 |
| 10 | 0 | 1 | 0 | 1 |

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

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

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

• Table 04:

| A | B | C | D | Y |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | X |
| 0 | 0 | 0 | 1 | X |
| 0 | 0 | 1 | 0 | X |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | X |
| 0 | 1 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 | X |
| 1 | 0 | 0 | 0 | 1 |
| 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 1 | 0 | X |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 0 | X |
| 1 | 1 | 1 | 1 | 1 |

| Y \ AB | 00 | 01 | 11 | 10 |
|--------|----|----|----|----|
| 00 | X | 0 | 1 | 1 |
| 01 | X | X | 1 | 0 |
| 11 | 0 | X | 1 | 1 |
| 10 | X | 0 | X | X |

| Y \ AB | 00 | 01 | 11 | 10 |
|--------|----|----|----|----|
| 00 | X | 0 | 1 | 1 |
| 01 | X | X | 1 | 0 |
| 11 | 0 | X | 1 | 1 |
| 10 | X | 0 | X | X |

$$Y = \bar{A}\bar{B}\bar{D} + \bar{A}\bar{C}D + BD + A\bar{C}\bar{D} + AC$$

$$Y = \bar{A}\bar{B}\bar{D} + \bar{A}\bar{C}D + B\cdot D + A\bar{C}\bar{D} + A\bar{C}$$

• Problem 2:

1) $Y = \overline{A}BC\overline{D} + A\overline{B}C\overline{D} + (A+B+C+D)$

| A | B | C | D | Y |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 1 |
| 1 | 0 | 0 | 1 | 1 |
| 1 | 0 | 1 | 0 | 1 |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 0 |

| AB \ CD | 00 | 01 | 11 | 10 |
|---------|----|----|----|----|
| 00 | 1 | 0 | 1 | 1 |
| 01 | 0 | 0 | 1 | 1 |
| 11 | 0 | 0 | 0 | 1 |
| 10 | 0 | 0 | 1 | 1 |

| A | B | C | D | Y |
|---|---|---|---|---|
| x | 0 | 0 | 0 | 1 |
| 1 | x | 0 | x | 1 |
| 1 | x | 1 | 0 | 1 |
| 1 | 0 | 1 | x | 1 |

$Y = \overline{B}\overline{C}\overline{D} + A\overline{C} + A\overline{C}D + A\overline{B}C$

• $Y = \overline{B} \cdot \overline{C} \cdot \overline{D} + A \cdot \overline{C} + A \cdot C \cdot \overline{D} + A \cdot \overline{B} \cdot C$

2) $Y = \overline{A}B \cdot C + \overline{B} \cdot \overline{C} + B \cdot C$

| A | B | C | Y |
|---|---|---|---|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 |

| AB \ C | 00 | 01 | 11 | 10 |
|--------|----|----|----|----|
| 0 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 |

| A | B | C | Y |
|---|---|---|---|
| x | 0 | x | 1 |
| 1 | x | x | 1 |
| x | x | 1 | 1 |

$Y = \overline{B} + A + C$

• $Y = \overline{B} + A \cdot C$

$$3) Y = (\overline{A+B+C+D}) + A \cdot D + B$$

| A | B | C | D | Y |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 1 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 1 | 0 | 0 | 1 |
| 0 | 1 | 0 | 1 | 1 |
| 0 | 1 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 1 |
| 1 | 0 | 1 | 0 | 0 |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 |

| Y \ CD | 00 | 01 | 11 | 10 |
|--------|----|----|----|----|
| 00 | 0 | 1 | 1 | 0 |
| 01 | 1 | 1 | 1 | 1 |
| 11 | 0 | 1 | 1 | 1 |
| 10 | 0 | 1 | 1 | 0 |

| A | B | C | D | Y |
|---|---|---|---|---|
| x | 1 | x | x | 1 |
| x | x | 0 | 1 | 1 |
| 1 | x | x | 1 | 1 |

$$Y = B + \bar{C}D + AD$$

$$\bullet Y = B + \bar{C}D + AD$$

$$4) Y = B \cdot C + \bar{A} \cdot \bar{B} \cdot \bar{C} + B \cdot \bar{C}$$

| A | B | C | Y |
|---|---|---|---|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 |

| Y \ C | 00 | 01 | 11 | 10 |
|-------|----|----|----|----|
| 0 | 1 | 1 | 1 | 0 |
| 1 | 0 | 1 | 1 | 0 |

| A | B | C | Y |
|---|---|---|---|
| 0 | x | 0 | 1 |
| x | 1 | x | 1 |

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

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

• Problem #5:

| A | V | M | Y |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 |

| Y \ AB | 00 | 01 | 11 | 10 |
|--------|----|----|----|----|
| 0 | 0 | 0 | 0 | 1 |
| 1 | 0 | 0 | 1 | 1 |

| A | V | M | Y |
|---|---|---|---|
| 0 | x | x | 0 |
| 1 | x | x | x |

• Ecuación reducida:

$$Y = AC + AB'$$

• Ecuación SOP:

$$Y = A \cdot B' \cdot C' + A \cdot B' \cdot C + A \cdot B \cdot C$$

• Ecuación POS:

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