Chapter 1.
1.6 Binary number representation and conversion to/from decimal

Chapter 2. Introduction to Logic Circuits
2.1 Variables and Functions
• series switch representation of AND function
• parallel switch representation of OR function
• logic expression: output = function of inputs
1.2 Inversion
• inverter using pull-up resistor
2.3 Truth tables
• relationship between logic function and truth table entries
2.4 Logic gates and networks
• AND, OR, and NOT gates: function and logic symbols
• timing diagrams
2.5 Boolean algebra
• George Boole and Claude Shannon
• axioms and single variable theorems (p. 31–32)
• additional theorems to memorize:

<table>
<thead>
<tr>
<th>Theorem</th>
<th>Dual</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>xx = x</td>
<td>x + x = x</td>
<td>idempotent</td>
</tr>
<tr>
<td>xy = yx</td>
<td>x + y = y + x</td>
<td>commutative</td>
</tr>
<tr>
<td>x(yz) = (xy)z</td>
<td>x + (y + z) = (x + y) + z</td>
<td>associative</td>
</tr>
<tr>
<td>x(y + z) = xy + xz</td>
<td>x + yz = (x + y)(x + z)</td>
<td>distributive</td>
</tr>
<tr>
<td>x + xy = x</td>
<td>x (x + y) = x</td>
<td>absorption</td>
</tr>
<tr>
<td>xy + x \bar{y} = x</td>
<td>(x + y)(x + \bar{y}) = x</td>
<td>combining</td>
</tr>
<tr>
<td>\bar{xy} = \bar{x} + \bar{y}</td>
<td>\bar{x} + \bar{y} = x \cdot y</td>
<td>DeMorgan</td>
</tr>
</tbody>
</table>

• minimization by algebraic manipulation
• Venn diagrams
2.6 Synthesis from truth tables
• SOP: sum of products using minterms Σmi
• POS: product of sums using maxterms ΠMi
2.7 NAND and NOR gates and logic
• functions and logic symbols
• dual representation with bubbles at inputs
2.8 2-input multiplexer
• function and symbol

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