

Experiment 10

Digital Design

Pre-Lab Report

Half Adder

From the table in Figure 3 we obtained:

$$S_1 = \bar{A}_1 B_1 + A_1 \bar{B}_1$$
$$C_1 = A_1 B_1$$

In the laboratory session you will only be provided with a 74LS00 chip which is a quad two input NAND gate chip and a 74LS04 hex inverter chip. In order to be able to implement the design you need to convert the equations of S_1 and C_1 into an equivalent algebraic form that only uses NAND gates and inverters. Use demorgan's theorem to prove that

$$S_1 = \overline{\overline{A(\overline{AB})} \cdot \overline{B(\overline{AB})}}$$

