Homework 12

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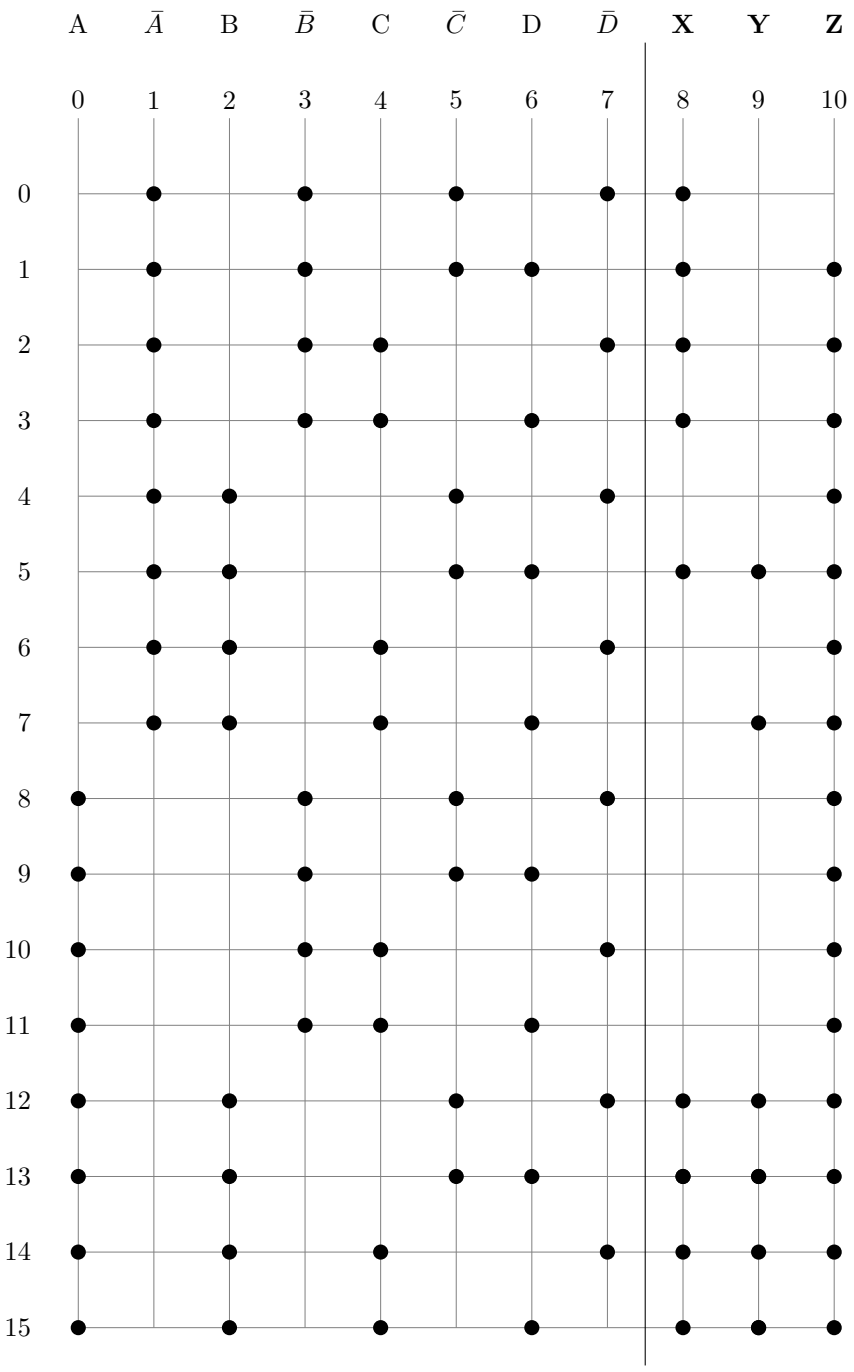
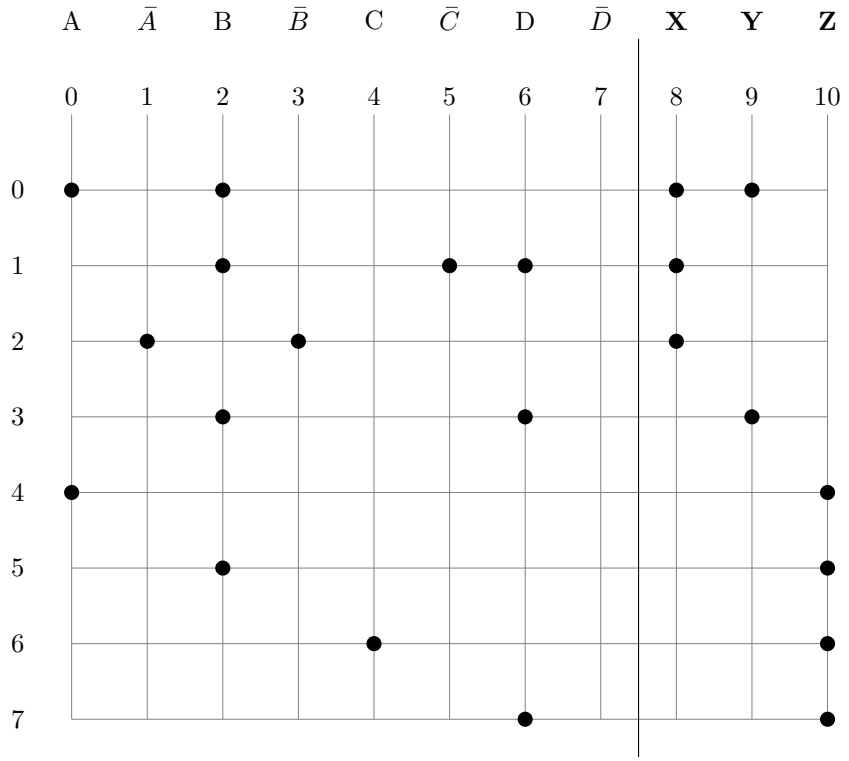
Exercise 5.51



Exercise 5.52



Exercise 5.53

Size of ROM to implement function

16-bit adder/subtractor with C_{in} and C_{out}

Two 16-bit inputs and a carry-in: 33 inputs. 8589934592 x 17

8x8 multipier

Two 8 bit inputs, 16-bit output. 65536 x 16

16-bit priority encoder

Can encode 4 numbers. 65536 x 4

Explanation

These are impractical to implement with a ROM because there is LOTS of redundancy in the ROM grid. These grids are far larger than they would be with more efficient reprogrammable logic options.

Exercise 5.55

Table 1: LUT4 logic elements required to implement the functions.

Function	LE
Exercise 2.13(c)	1
Exercise 2.17(c)	1
the two-output function from Exercise 2.24	2
the function from Exercise 2.35	2
a four-input priority encoder (see Exercise 2.36)	2

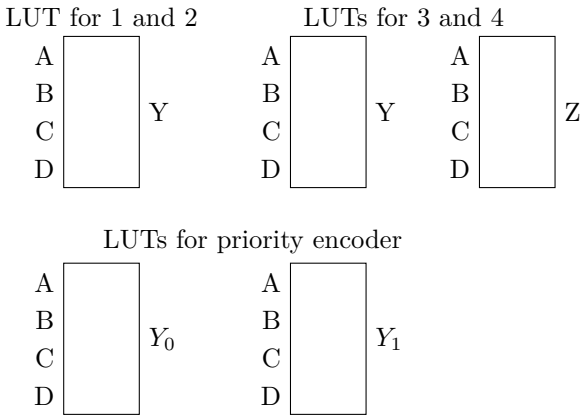


Figure 1: LUT configurations from Table 1