Lecture 11

Procedure for finding a minimum-cost cover

1. Find PIs
2. Include Essential PIs in the cover
3. If needed, choose other PIs (as few as possible) to cover all minterms
   Remember K-maps wrap around edges and corners

Don't Cares

- Either specific inputs don't occur
- Or we don't care
- Leads to cheaper logic

Consider a 4 digit binary input where we do not care about the terms A-F. Then

$x_1x_0 \backslash x_3x_2$	00	01	11	10
00	0	1	d	0
01	1	0	d	0
11	0	0	d	d
10	0	0	d	d

Then we have $h_0 = \overline{x_1 x_3}(\overline{x_0} + \overline{x_2})(x_0 + x_2)$

Sequential Circuits

- Combinational circuits: outputs are only determined by present inputs
- Sequential circuits: outputs are determined by both present inputs and previous inputs
- Example: Alarm System
  - R reset
  - S: sensor
  - Alarm starts once S is on, only stops when R is reset

R NOR (S NOR Q) = Q
Note that R, S, Q all start with 0. Therefore when S is triggered, S = Q = 1, R = 0. Even when S returns to 0, Q = 1, S = R = 0. Only by resetting (R = 1) will the alarm stop. Of course, undoing the reset (R = 0) will stop the alarm if and only if S = 0.

RS Latch

- Cross Coupled NOR gates