

Tracing ASM

- Entries in the table represent values that change during the cycle
 - o So whenever a value is read, it should be from the previous line

Drawing from Friday ASM diagram

Cycle	State	START	
0	IDLE	0	in cycle 1, decision is based on value from cycle 0
1	IDLE	1	
2	idle	0	
3			

A Faster Multiplier

Input: two n-bit value m, n

Output: one 2n-bit value, A||B

We can use the same multiplication algorithm for binary as for decimal

Eg.

$$\begin{array}{r}
 32 \\
 \times 12 \\
 \hline
 68 \\
 34 \\
 \hline
 408
 \end{array}
 \qquad
 \begin{array}{r}
 1\ 1\ 1\ 0 \\
 0\ 1\ 0\ 1 \\
 1\ 1\ 1\ 0 \\
 0\ 0\ 0\ 0 \\
 1\ 1\ 1\ 0 \\
 0\ 0\ 0\ 0 \\
 \hline
 0\ 1\ 0\ 0\ 0\ 1\ 1\ 0
 \end{array}$$

- we can add n-bit values, instead of 2n-bit values by shifting right to do

$$\begin{array}{l}
 1101 = R \\
 X0101 = S
 \end{array}$$

Product	<u>S</u>
0000	01010 (copy R and add)
+1101	
add: 1101	
sr: 0110 1	
+0000	
add: 0110 1	
sr: 0011 01	01
+1101	
add: 0000 00	
sr: 10000 001	0
add 0:	

