

Slide-19

Traditional:

$$\begin{array}{r}
 1101 \\
 \times 1010 \\
 \hline
 0000 \\
 1101 \\
 0000 \\
 1101 \\
 \hline
 10000010
 \end{array}$$

Observation:

Shift right at each step instead of left

Simpler implementation:

$$\begin{array}{r}
 1101 \\
 \times 1010 \\
 \hline
 0000 \\
 00000 \\
 1101 \\
 11010 \\
 011010 \\
 0000 \\
 011010 \\
 0011010 \\
 1101 \\
 10000010
 \end{array}$$

First PP:
 (t1) Shift right:
 Second PP:
 Add:
 (t2) Shift right:
 Third PP:
 Add:
 (t3) Shift right:
 Fourth PP:
 (t4) Add:

Simpler implementation (actual register):

{product, multiplier} = 00001010 ← initially

Shift right: 00000101 ← (t1)

+ 1101

11010101

Shift right: 01101010 ← (t2)

+ 0000

01101010

Shift right: 00110101 ← (t3)

+ 1101

need space (temporary) → 100000101
 ↑
 Carry out

Shift right: 10000010 ← (t4)