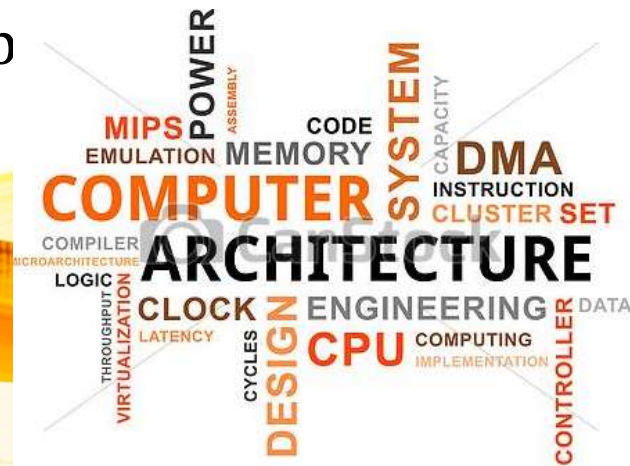


# UNIT II

## ARITHMETIC OPERATIONS

Addition and subtraction of signed numbers – Design of fast adders – **Multiplication of positive numbers** - Signed operand multiplication- fast multiplication – Integer division – Floating point num



# Recap the previous Class

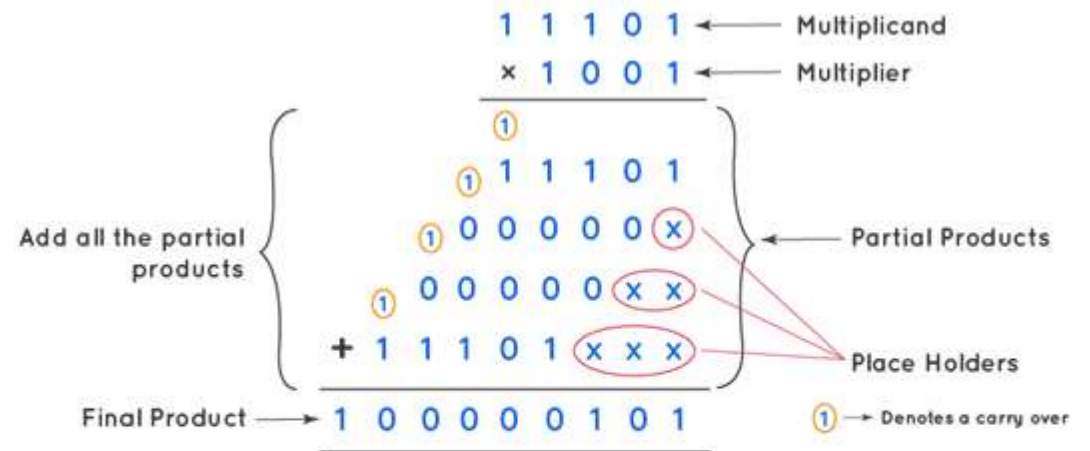


# Manual Multiplication Algorithm

## BINARY MULTIPLICATION

$$\begin{array}{r}
 1101 \quad (13) \\
 \times 1011 \quad (11) \\
 \hline
 1011 \\
 0000 \\
 1011 \\
 1011 \\
 \hline
 10001111 \quad (143)
 \end{array}$$

Binary multiplication is even easier than decimal, because we have either multiplication by 1 or by 0 in the intermediate sums.



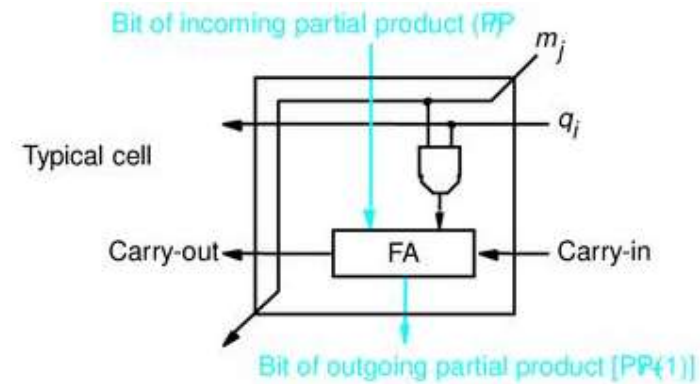
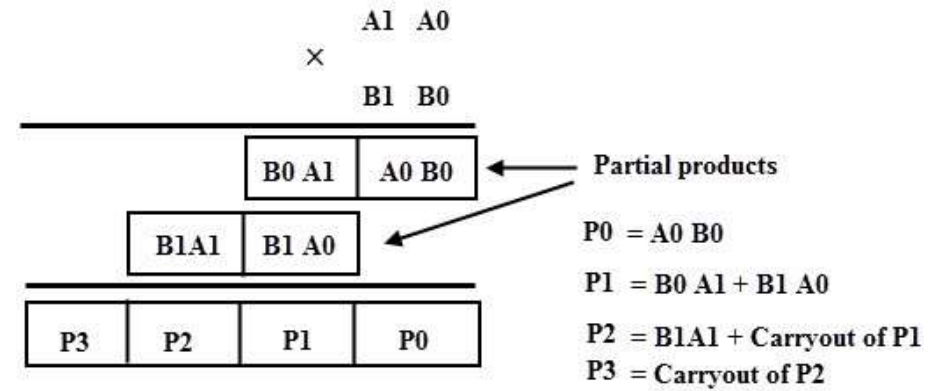
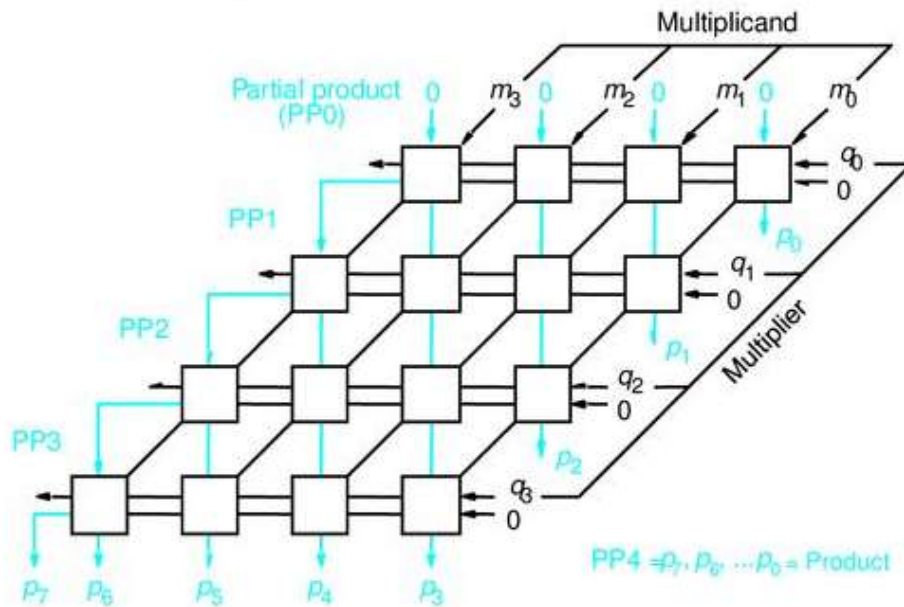
### Rules of Binary Multiplication

$0 \times 0 = 0, 0 \times 1 = 0, 1 \times 0 = 0, 1 \times 1 = 1$

### Rules of Binary Addition

$0 + 0 = 0, 0 + 1 = 1, 1 + 1 = 10, 1 + 1 + 1 = 11$

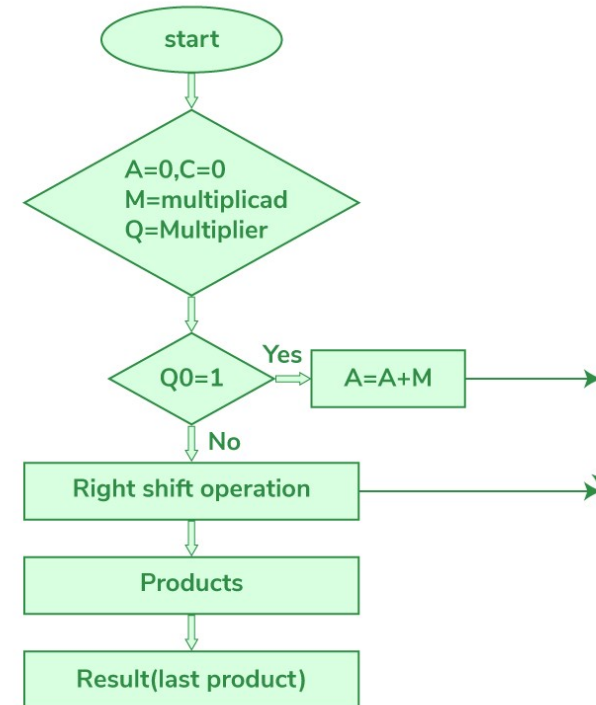
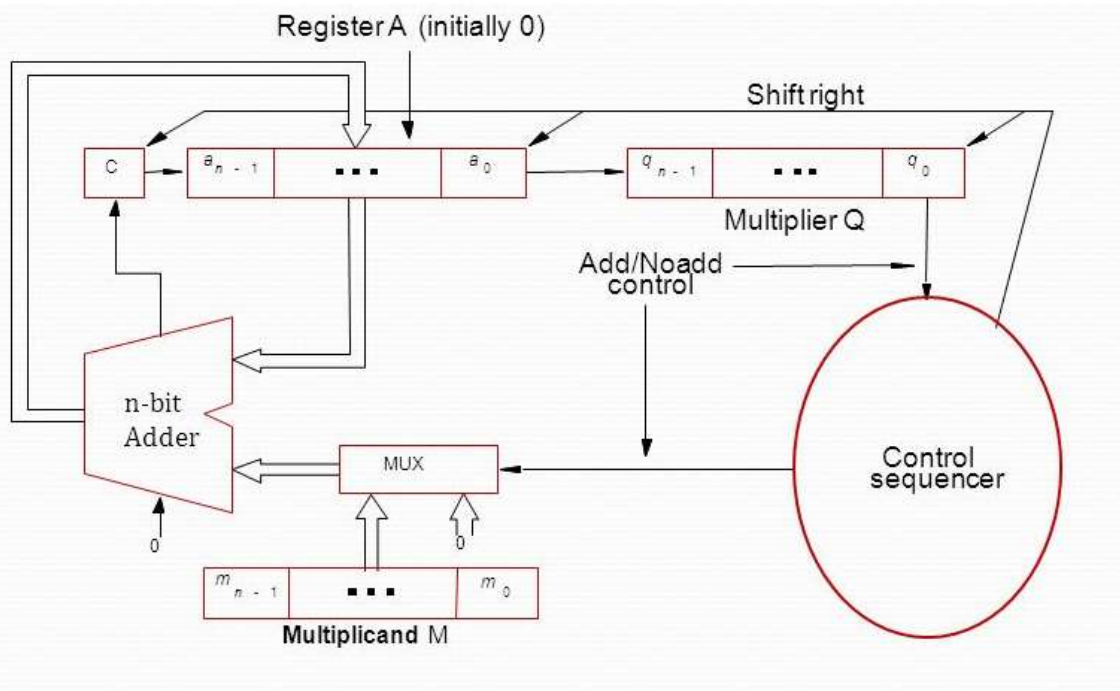
# Array Multiplication of Positive Binary Operands





# Register Configuration

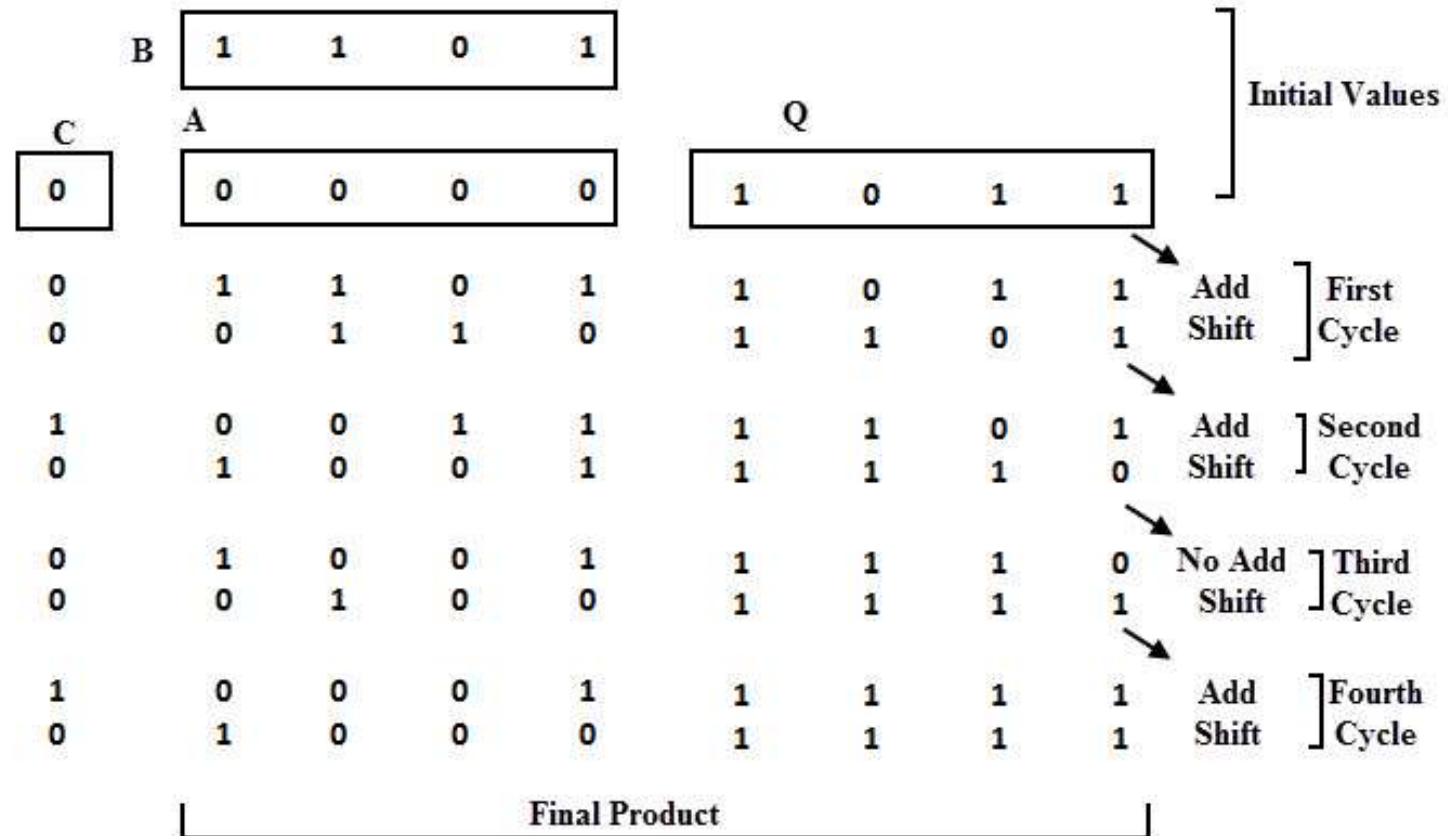
# Sequential Circuit Binary Multiplier



# Sequential Circuit Binary Multiplier <sup>6/11</sup>

13 X 11  
7 X 3

Multiplication Example





**sns**  
INSTITUTIONS

7/11



*Thank You*