# Experiment 3

(Restoring and Non-Restoring division algorithm)

Aim: Implement Restoring and Non-Restoring division algorithm

Theory: A division algorithm provides a quotient and a remainder when we divide two numbers. They are of two types slow algorithm and fast algorithm. Slow division algorithms are restoring, non-restoring, non-performing restoring, SRT algorithm and under fast comes Newton–Raphson and Goldschmidt.

In the figure shown below register Q contain quotient and register A contain remainder. Here, n-bit dividend is loaded in Q and divisor is loaded in M. Value of Register is initially kept 0 and this is the register whose value is restored during iteration due to whichit is named Restoring.
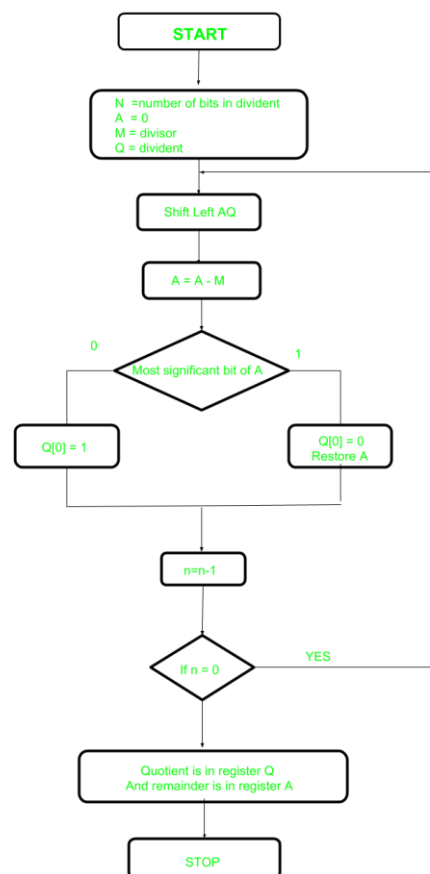
Restoring Division Algorithm

Perform Division Restoring Algorithm Dividend = 11Divisor = 3

n	M	A	Q	Operation
4	00011	00000	1011	initialize
	00011	00001	011_	shift left AQ
	00011	11110	011_	A=A-M
	00011	00001	0110	Q[0]=0 And restore A
3	00011	00010	110_	shift left AQ
	00011	11111	110_	A=A-M
	00011	00010	1100	Q[0]=0
2	00011	00101	100_	shift left AQ
	00011	00010	100_	A=A-M
	00011	00010	1001	Q[0]=1
1	00011	00101	001_	shift left AQ
	00011	00010	001_	A=A-M
	00011	00010	0011	Q[0]=1

Lab Assignments to complete in this session

1. Perform binary division of dividend 17 and divisor 3 using restoring division algorithm.

2. Perform binary division of dividend 12 and divisor 3 using non restoring division algorithm.