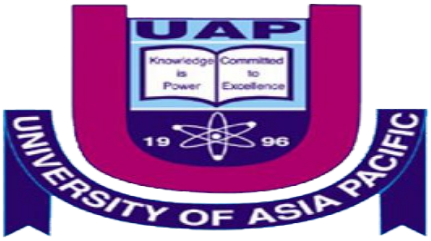

UNIVERSITY OF ASIA PACIFIC

Department of Computer Science & Engineering

Assignment on Division Algorithm

Course Code : CSE 317

Course Title : Computer Architecture

Submitted by:

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Division Algorithm
3rd version

20101106

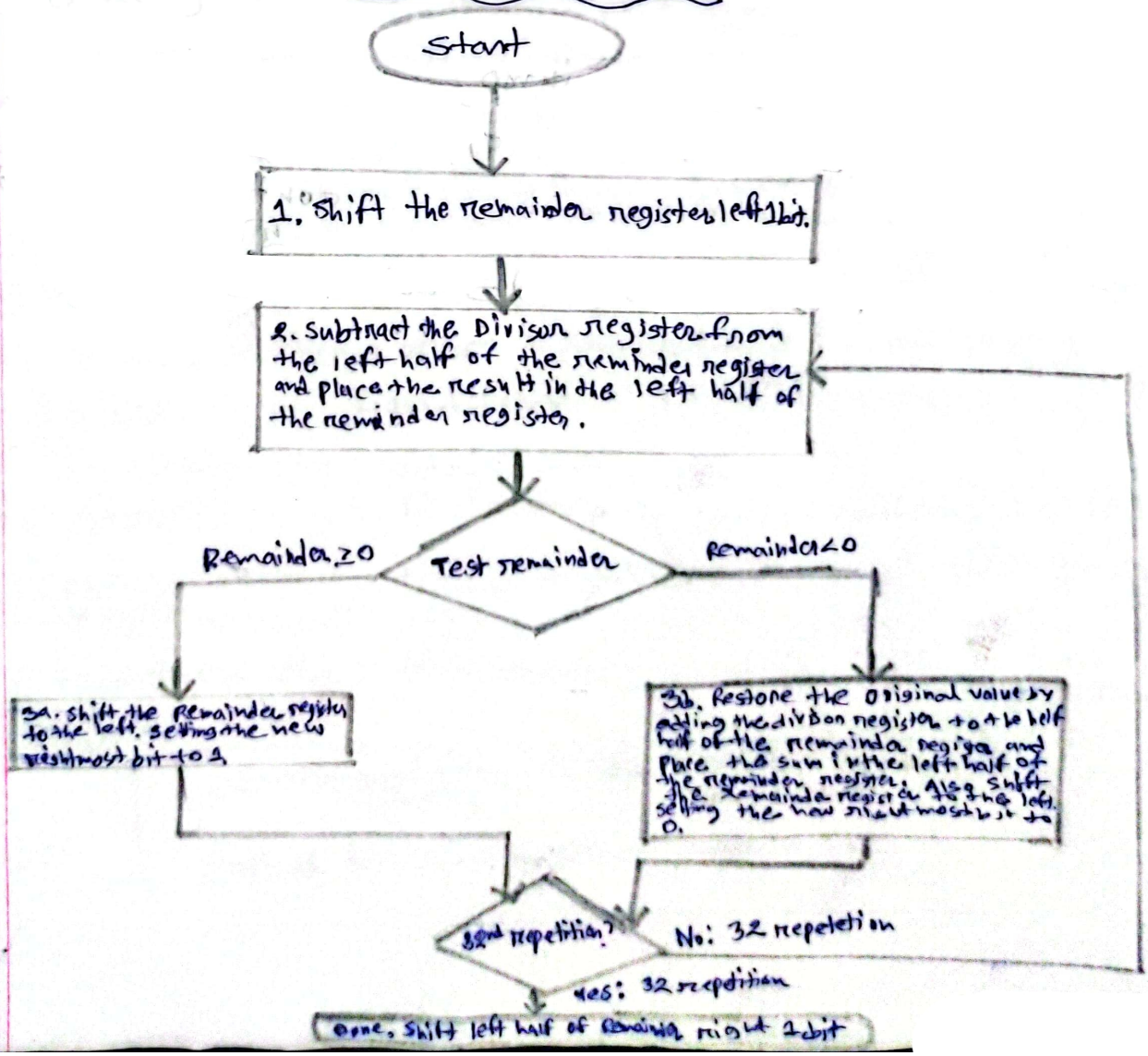
Division algorithm 3rd version properties:

(i) No extra separate Quotient register.

(ii) Divison register & ALU is 32-bit wide & Remainder register is 64 bit wide.

(iii) The remainder register is shifted left before the subtraction.

The algorithm is given below:



Example of version 3

My UAP ID = 20101106 (even ID Number)

So, Divisor = $(3)_{10} = (0011)_2$

Dividend = $(9)_{10} = (1001)_2$

Iteration	steps	Divisor	Remainder	
0	Initialization	0011	0000	1001
	1. 1bit LS of R		0001	0010
1	2. LHR = LHR-Divisor		1110	0010
	3b. LHR = LHR + Divisor		0001	0010
	LS of the R and set RMB to 0		0010	0100
2	2. LHR = LHR- Divisor		1111	0100
	3b. LHR = LHR + Divisor		0010	0100
	LS of the R and set RMB to 0		0100	1000
3	2. LHR = LHR-Divisor		0001	1000
	3a. LS of the R and set RMB to 1		0011	0001
4	2. LHR = LHR-Divisor		0000	0001
	3a. LS of the R and set RMB to 1		0000	0011

After the 4th iteration, the left half of the remainder is right shifted 1 bit.

We get the Remainder = $(0000)_2 = (0)_{10}$

Quotient = $(0011)_2 = (3)_{10}$

Ans.