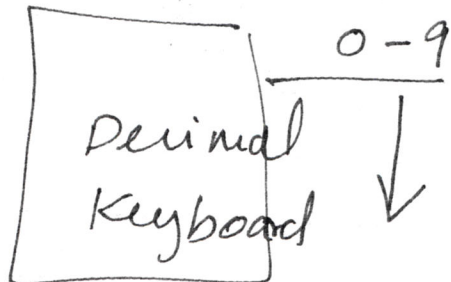


Sept 1, 2017

CSE241

1

Decimal



Binary Coded Decimal

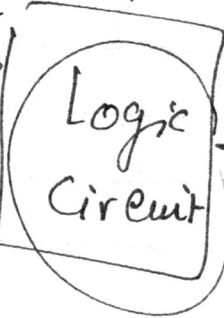
0000 0  
 ⋮ ⋮  
 1001 9

input

80... 93

1010  
 1011  
 1100  
 1101  
 1110  
 1111

Don't Care

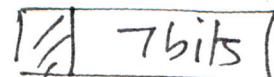


output

BCD	0	0000
	⋮	
Binary Code Decimal	9	1001

ASCII

7bits



8bits - 1byte

Parity bit

Binary #

$(101.01)_2 \rightarrow (\quad)_{10}$   
 $\uparrow \uparrow \uparrow \uparrow \uparrow$   
 $\dots 2^2 \ 2^1 \ 2^0 \ 2^{-1} \ 2^{-2} \dots$   
 $4 + 0 + 1 + \frac{1}{2}$   
 $(5.25)_{10}$

$\frac{0}{2} + \frac{1}{4}$

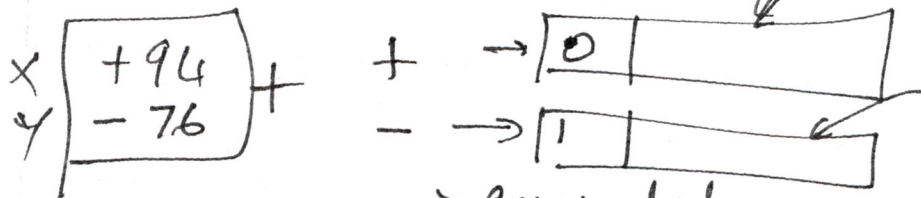
A = 53

B = 76 Sept 20 11

(2)

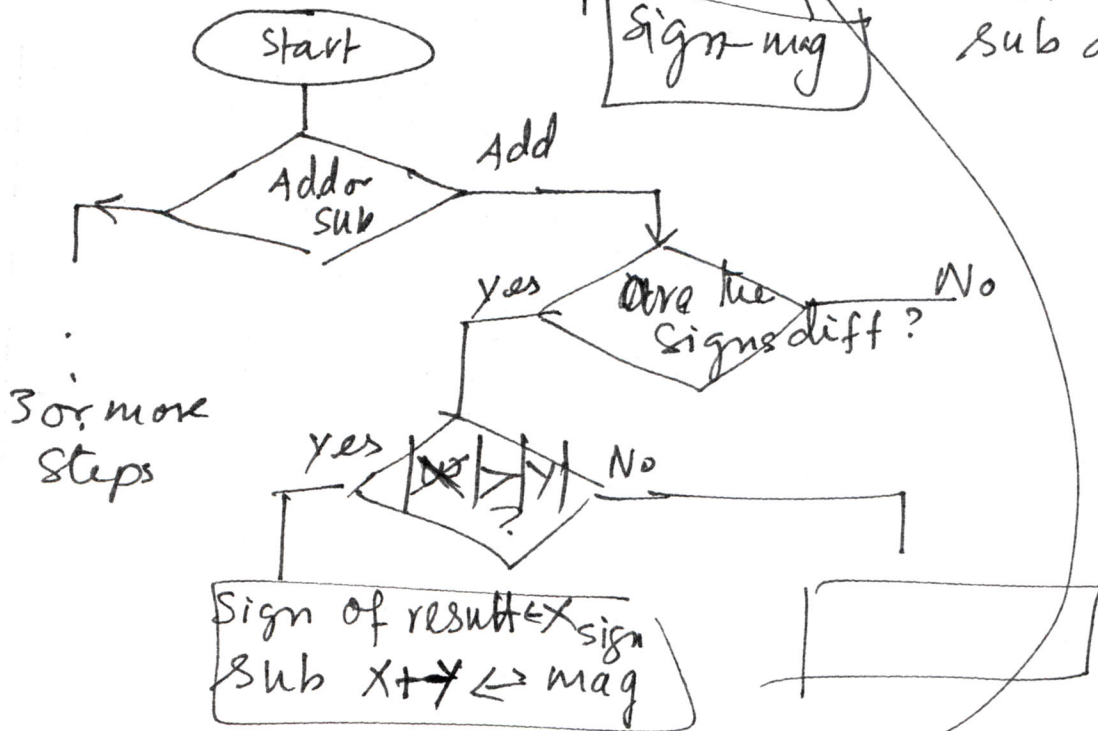
+ 94 → represent  
- 94

Sign Value of magnitude



→ computation  
Sign mag

add alg  
sub alg



Data inherent complexity

Can we make this computation more efficient?

2's complement ⇒ radix complement

(2)

- I Sign - magnitude
  - II 2's complement method
- for number representation.

Sept 1, 2011

represent the positive numbers using sign-mag  
the negative numbers using 2's complement

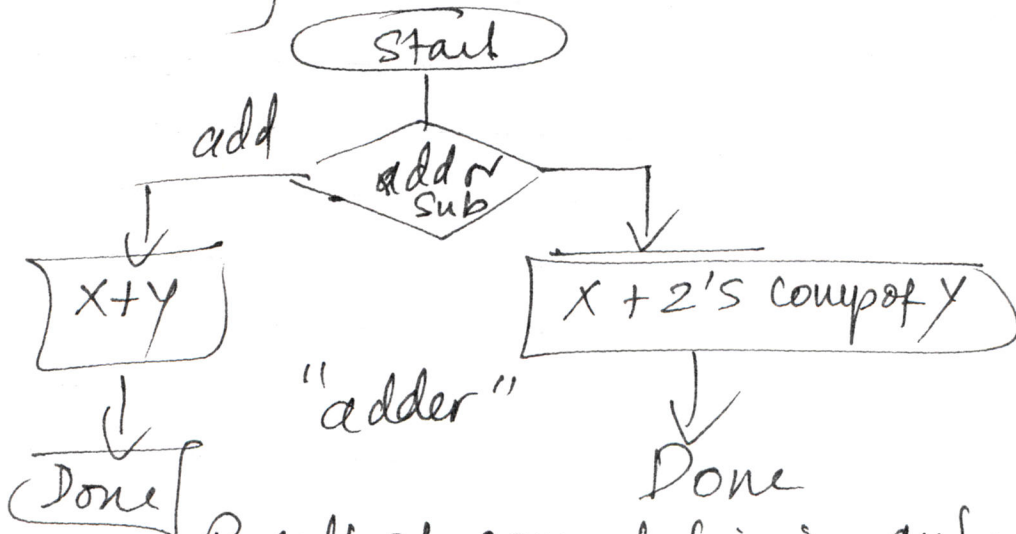
2 | 46  
 2 | 23 - 0  
 2 | 11 - 1  
 2 | 5 - 1  
 2 | 2 - 1  
 1 - 0

+46 → 00101110

-46 → 2's complement of the  
11010001 1's comp

00101101  
 +1  
00101110

11010010 2's comp  
 ← MSB X+Y      LSR



Result of computation is automatically in sign-mag for positive # ; 2's comp. for negative #

# 8bit Container

(3)

Sept 1, 201

Prep:

$A = 53$

$B = 76$

+A  
-A

+B  
-B

$$\begin{array}{r}
 2 \overline{) 53} \\
 \underline{26} \quad -1 \\
 2 \overline{) 26} \\
 \underline{13} \quad -0 \\
 2 \overline{) 13} \\
 \underline{6} \quad -1 \\
 2 \overline{) 6} \\
 \underline{3} \quad -0 \\
 1 \quad -1
 \end{array}$$

$$\begin{array}{r}
 2 \overline{) 76} \\
 \underline{38} \quad -0 \\
 2 \overline{) 38} \\
 \underline{19} \quad -0 \\
 2 \overline{) 19} \\
 \underline{9} \quad -1 \\
 2 \overline{) 9} \\
 \underline{4} \quad -1 \\
 2 \overline{) 4} \\
 \underline{2} \quad -0 \\
 2 \overline{) 2} \\
 \underline{0} \quad -0
 \end{array}$$

+A 00110101

+B 00001100

-A 11001010  
+1

~~11010011~~

-A 11001011

- ~~11010011~~  
110011 ← 1's com  
+1

-B 10110100