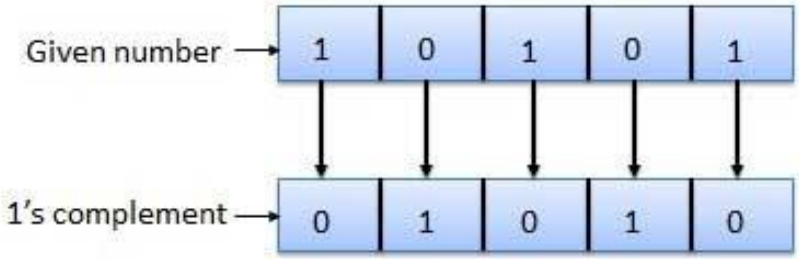
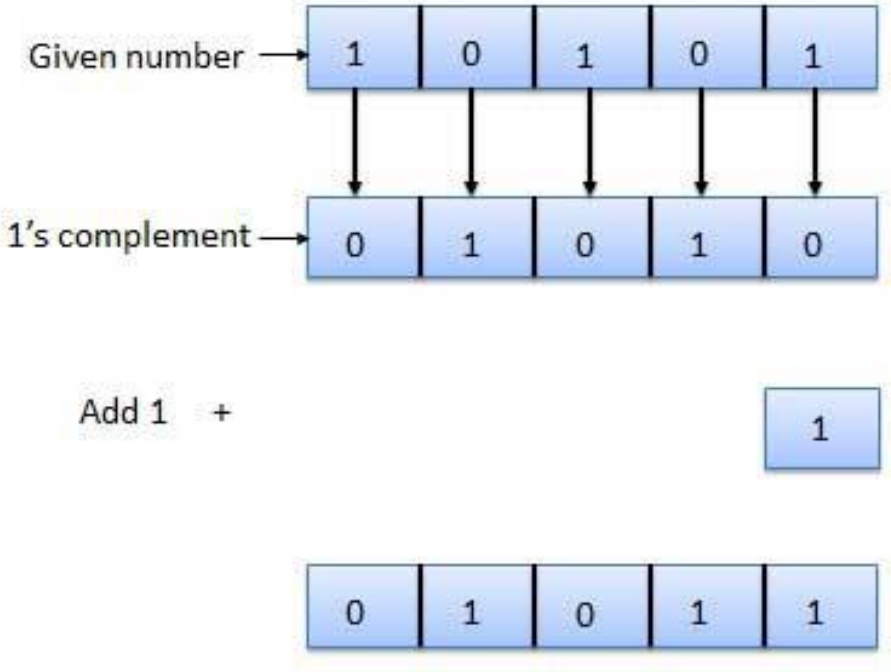
COMPLIMENTS

Complements are used in the digital computers in order to simplify the subtraction operation and for the logical manipulations.

1's complement



2's complement



Ex. Find the subtraction $(1110101 - 1001101)_B$ using the 2's complement method.

Sol. Minuend = 1110101

. Subtrahend = 1001101

. Minuend = 1110101

. 2's complement of subtrahend = + 0110011

. = 10101000

Here, an end carry occurs, hence discard it.

The result of $(1110101 - 1001101)_2$ is $(0101000)_2$

9's Compliment

Example : Find the 9's-compliment of 55274.

Sol: 99999

-55274

. 44725

10's Compliment

Solve $Y = (157)_D - (61)_D = (?)_D$ using 10's compliment method.

Sol : Take the 9's compliment of $(061)_D$

Add 1 to get the 10's compliment

Then add the first number ie; $(157)_D$

$$Y = (157)_D - (061)_D$$
$$= (157)_D + (-061)_D$$
$$= (157)_D + (\text{ 10's compliment of } (061)_D)$$
$$= (157)_D + (\text{ 9's compliment of } (061)_D + 1)$$

=> 9's compliment of $(061)_D$ = 999
− 061

938
\+ 1

10's compliment 939

$Y = (157)_D - (061)_D$

= 157
+ 939

1096

Since the last carry is 1 therefore the result is a +ve number and neglect the carry.

Therefore result is 96 in decimal

$Y = (157)_D - (061)_D = (96)_D$

Ex.2. Find the subtraction $(51346 - 06934)_D$ using the 10's compliment method.

Solution:- Minuend = 51346

. Subtrahend = 06938

.

. Minuend = 51346

10's compliment of subtrahend = + 93062

. = 1,44408

Here, an end carry occurs, hence discard it.

The result of $(51346 - 06938)_D$ is $(44408)_D$