1.Binary Addition

Binary addition is similar as doing everyday **addition** (decimal **addition). For** example: in decimal **addition**, if you add 8 + 2 you get ten, which you write as 10; in the sum this gives a digit 0 and a carry of 1.

0+0=0

0+1=1

1+0=1

1+1=10 (with carry of 1)

Carried bit

For Example:

In decimal addition	**In binary addition**
1	**1**
+1	**+1**
2	**10** (**1 is carried bit)**
Binary of 2 is 10	

1 1 1 ← Carried Bits

```
 10101
+   11
------
 11000
```


In decimal term **1+1+1= 3**

In binary term **binary of 3 is 11**

Carried bit

```
      1 1
      1 0 1 0 1
      111111
      111111
+ 10  111111
-------------
  10  111101
```

1+1+1+1=4 (binary of 4 is 100)

0+1+1+1= 3 (11)

1+1+1+1+1= 5(101)

2. Binary Subtraction

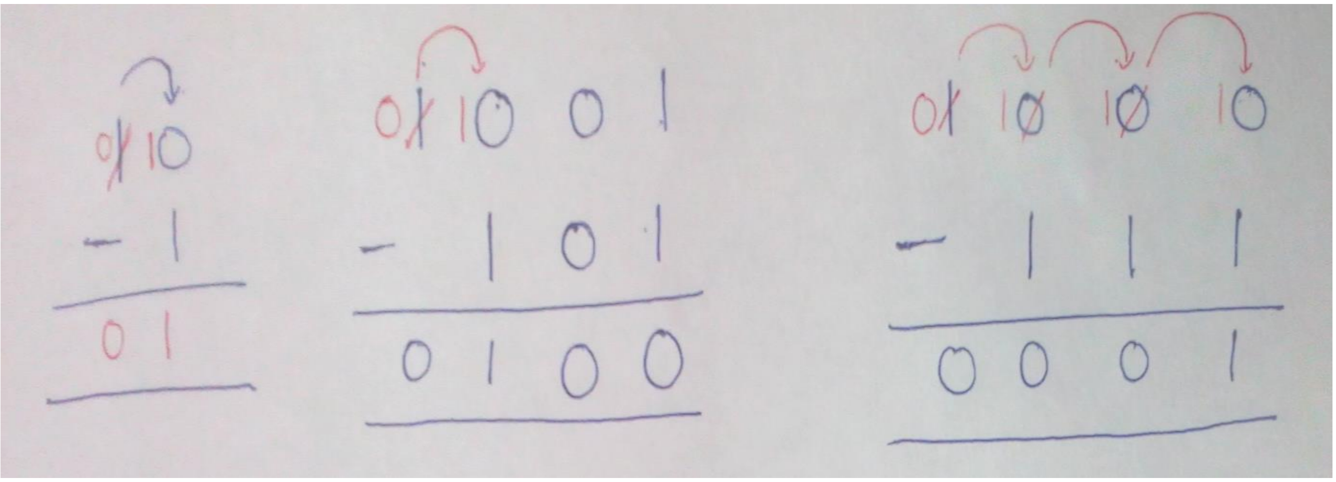
Binary subtraction is also similar to that of decimal **subtraction** with the difference that when 1 is subtracted from 0, it is necessary to borrow 1 from the next higher order bit and that bit is reduced by 1 (or 1 is added to the next bit of subtrahend) and the remainder is 1.

0-0=0

1-0=1

1-1=0

0-1=1 (with borrow of 1)



3. Binary multiplication

Binary multiplication is similar to decimal multiplication and it is similar than decimal multiplication because only 0's and 1's are involved.

0x0=0

0x1=0

1x1=1

```
      110
X     010
    -----
      000
     110x
    000xx
    -----
    01100
    -----
```

4. Binary Division

Binary division is similar to decimal division. It is called as the long division procedure.

0 ÷ 1=0

1÷1=1