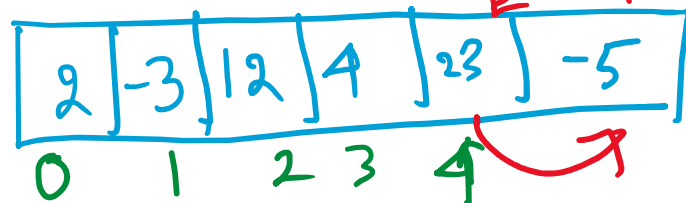
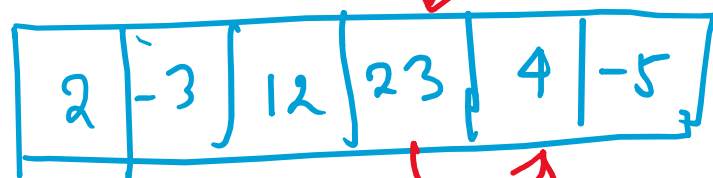
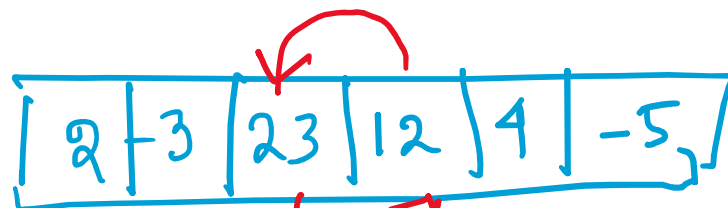
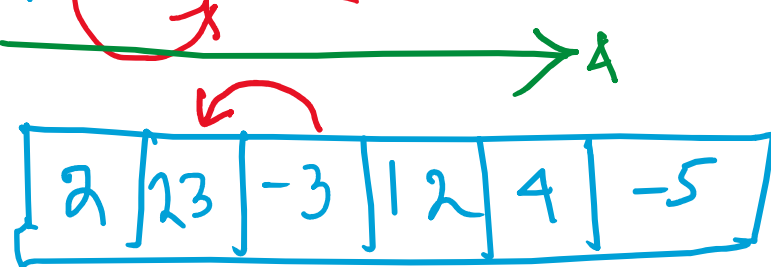
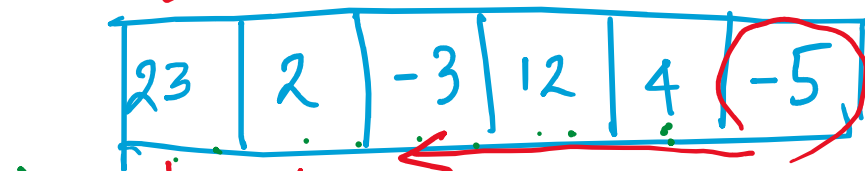


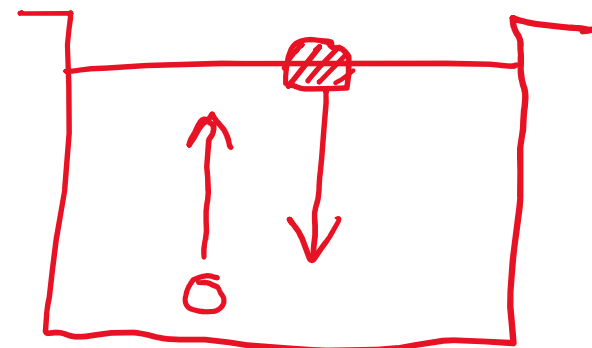
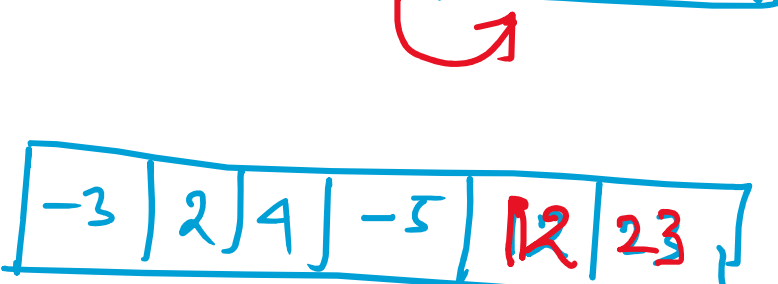
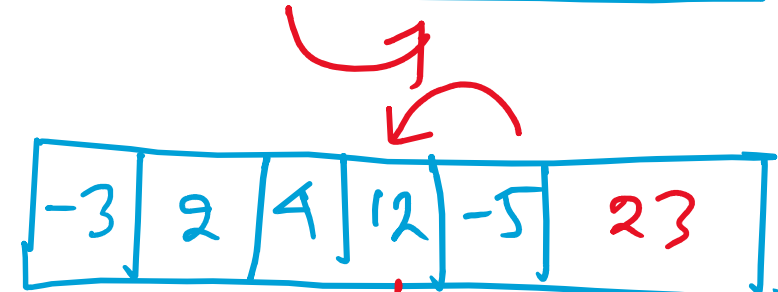
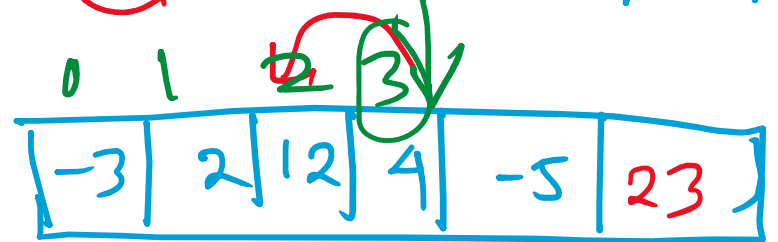
Sorting without "sort" method.

$i = 0$  ✓

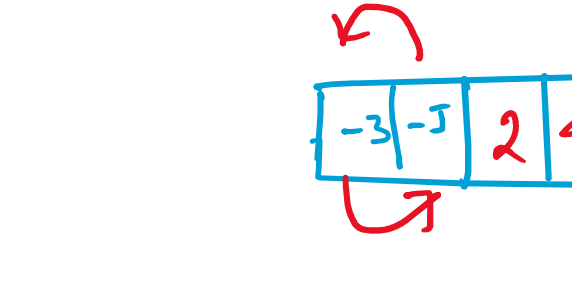
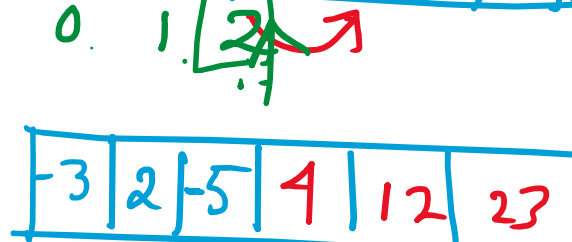
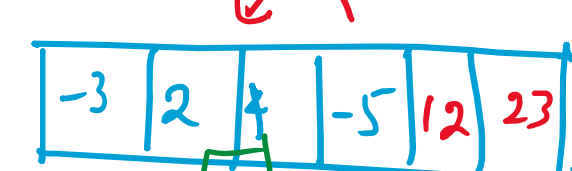


I want to arrange in ascending order.

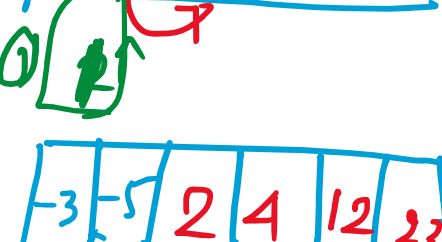
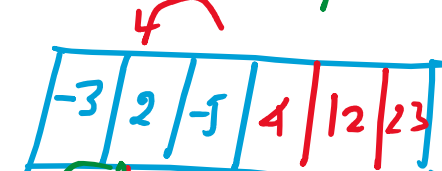
$i = 1$  (4)



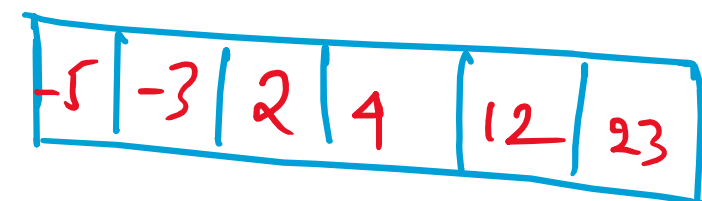
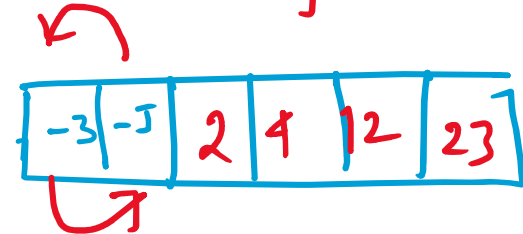
$i = 2$  (4)



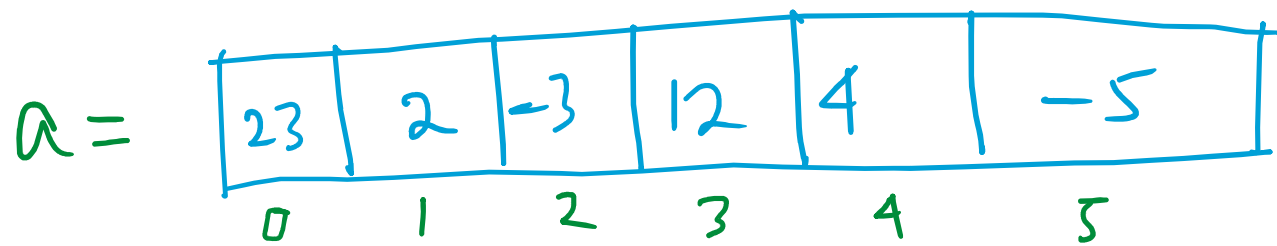
$i = 3$



$i = 4$



Bubble Sort



$\text{len}(a) = n$  (here  $n=6$ )

FOR  $i$  FROM 0 TO  $n-1$ :

FOR  $j$  FROM 0 TO  $n-i-1$ :

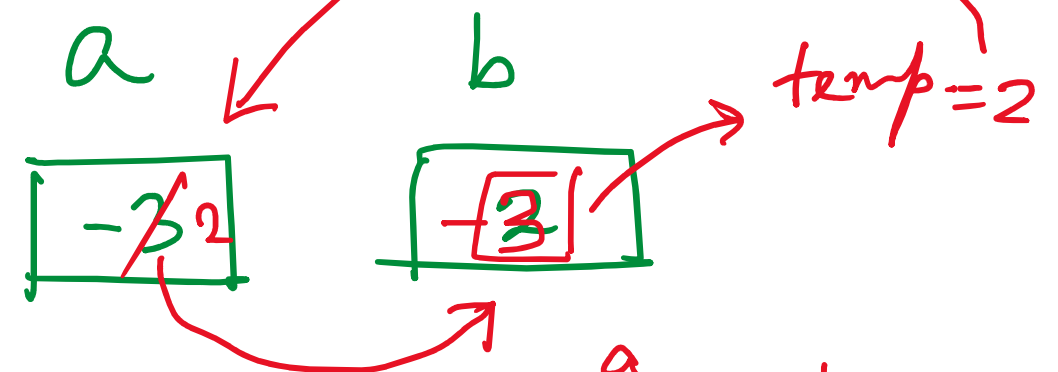
IF  $a[j] > a[j+1]$ :

$\text{temp} = a[j]$

$a[j] = a[j+1]$

$a[j+1] = \text{temp}$ .

~~$n-i-1 + i = (n-1)$~~



$a = b \rightarrow$ 

$a$
2

$b$
2

$b = a \rightarrow 2, 2$

$\text{temp} = b$ 

$a$
-3

$b$
2

$\text{temp}$
2

$b = a$ 

$a$
-3

$b$
-3

$\text{temp}$
2

$a = \text{temp}$ 

$a$
2

$b$
-3

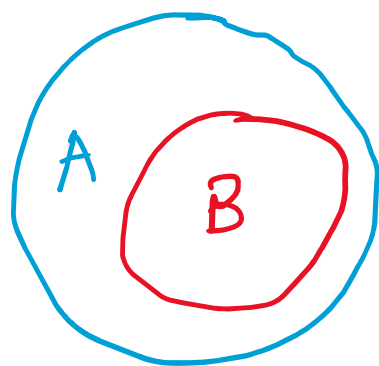
$\text{temp}$
2

## Set theory

Set is unordered collection of elements & it can't contain duplicate elements.

$\{a, b, c, d\}$

Venn diagram



$A \supseteq B \longrightarrow \supseteq$  Superset.

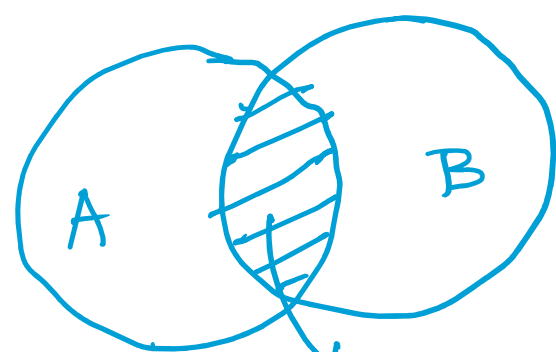
$B \subseteq A \longrightarrow \subseteq$  subset

$A = \{ 'a', 'e', 'i', 'o', 'u' \}$  vowels.

$A \subseteq B$

$B = \{ 'a', 'b', 'c', 'd', \dots, 'z' \}$  Set of alphabets

$C = \{ 'b', 'c', 'd', 'f', \dots, 'z' \}$  Set of consonants



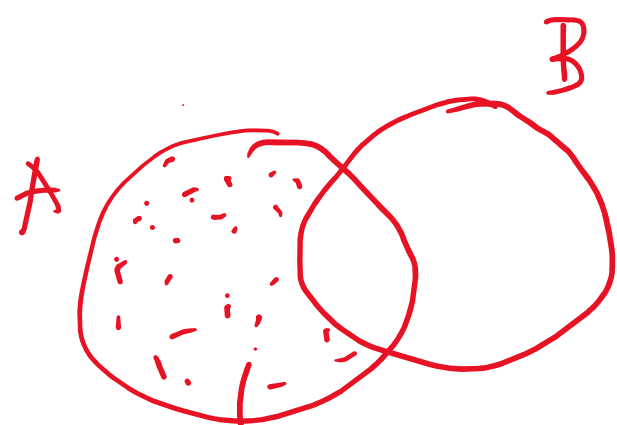
intersection

common elements between A & B.

$A$  = set of all prime numbers from 1 to 100

$B$  = set of all odd numbers from 1 to 100

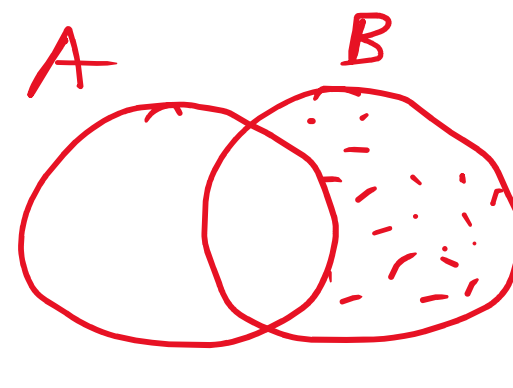
$A \cap B$

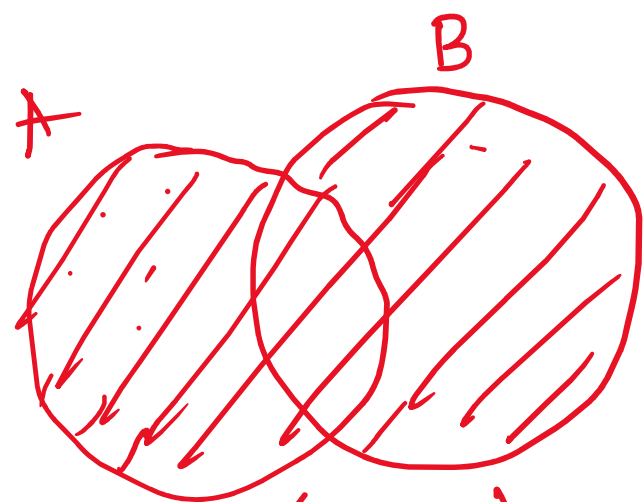


$A - B$  (A difference B)

elements in A but not in B

$B - A$





<sup>3 or 5</sup>  
 $A \cup B$  (A union B)

$$= \{3, 5, 6, 9, 10, 12, 15, \dots\}$$

$A = \{\text{set of numbers divisible by 3 between 1 to 100}\}$

$B = \{\text{set of numbers " " 5 between 1 to 100}\}$

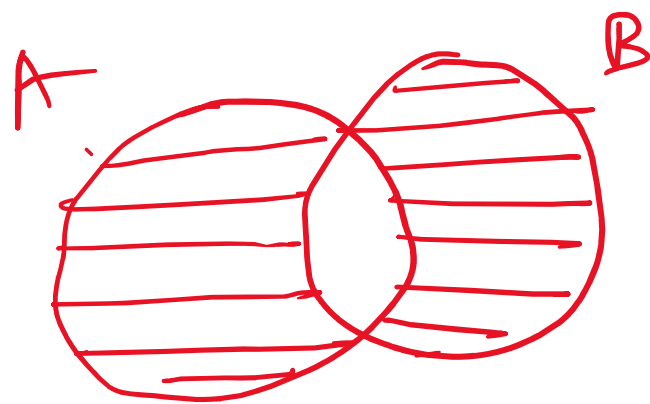
3 and 5

$$A \cap B = \{15, 30, 45, 60, 75, 90\}$$

$$A - B = \{3, 6, 9, 12, 18, 21, \dots\}$$

$$B - A = \{5, 10, 20, 25, 35, \dots\}$$

Symmetric difference.

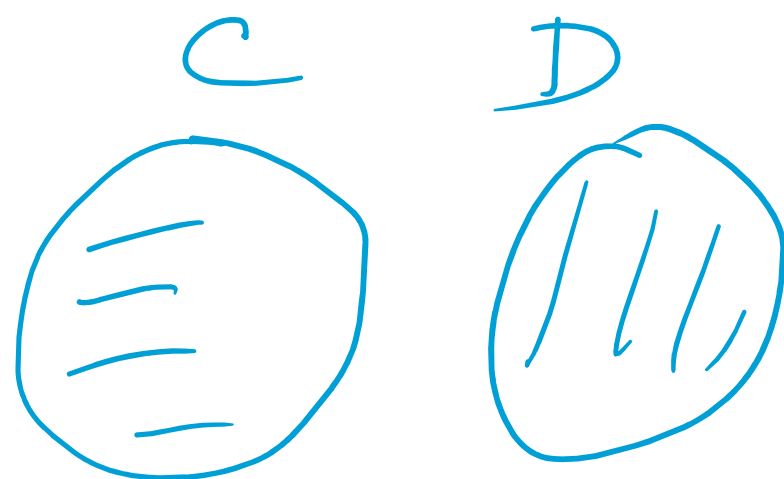


$$(A - B) \cup (B - A)$$

$$(A \cup B) - (A \cap B)$$

A, B

if  $A \subseteq B$  &  $B \subseteq A$  then A & B are equal sets.



C and D are called disjoint sets.

Dictionary / fruits =

key : value.	keys	values.
{	'apple'	: <u>20</u>
	'banana'	: 100
	'mango'	: 50
	'pineapple'	: 30
}		

[20, 100, 50, 30]

↑     ↑     ↑     ↑

0     1     2     3

---

fruits.

FUNCTION function\_name (arg1, arg2, ...):

{

RETURN - - -