formula

Convert 1D to 2D :

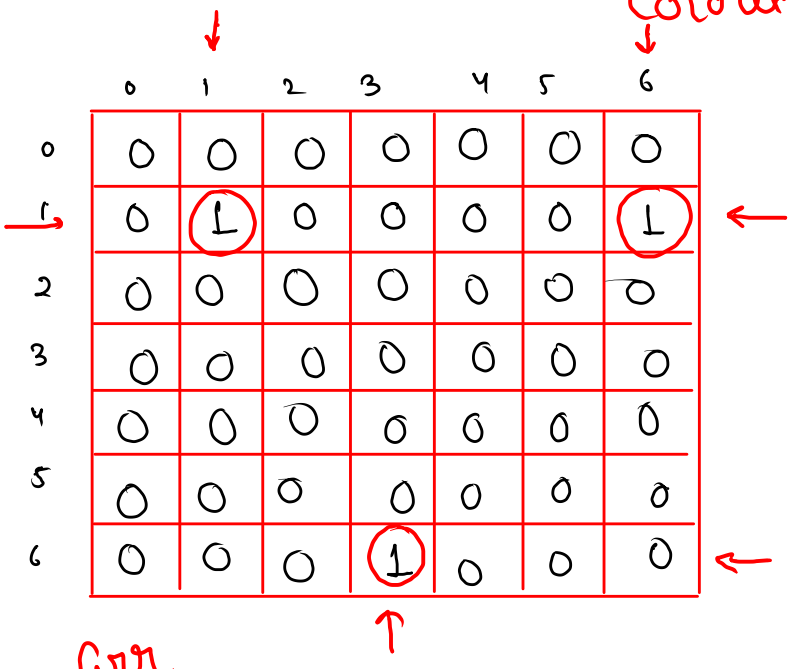
```
row = idx / col_size;
col = idx % col_size;
```

Convert 2D to 1D :

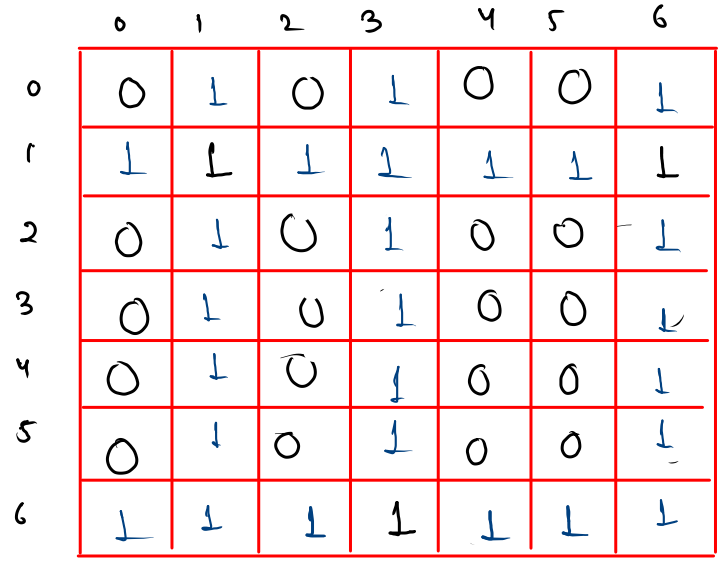
```
idx = row * col_size + col;
```

Modify The Matrix

→ convert entire row and entire column to 1 or True



	0	1	2	3	4	5	6
0	0	0	0	0	0	0	0
1	0	1	0	0	0	0	1
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	1	0	0	0



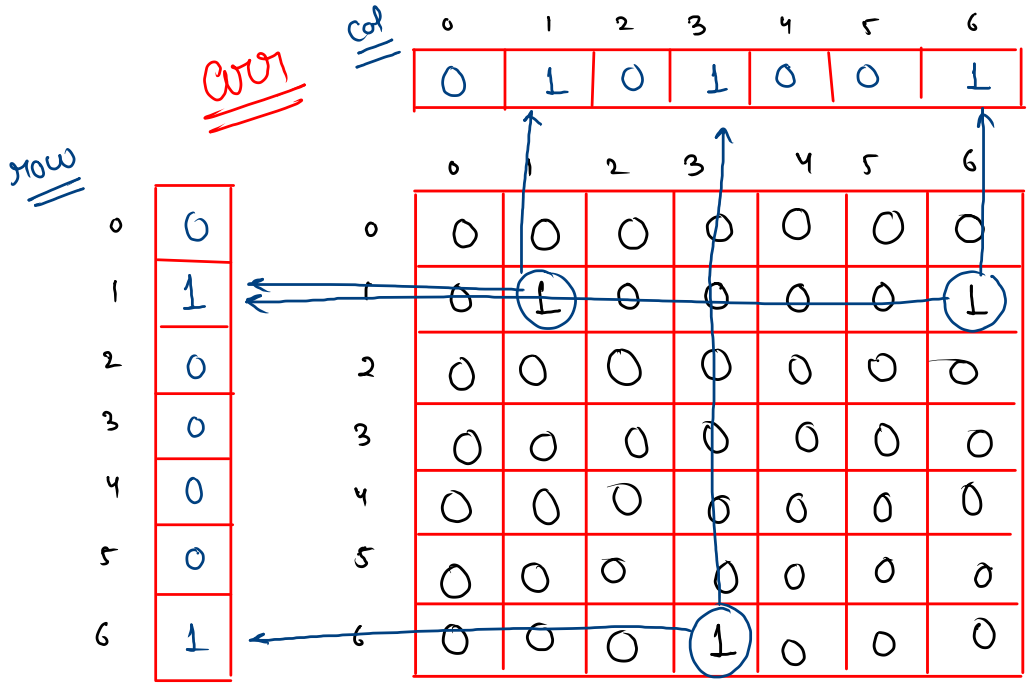
	0	1	2	3	4	5	6
0	0	1	0	1	0	0	1
1	1	1	1	1	1	1	1
2	0	1	0	1	0	0	1
3	0	1	0	1	0	0	1
4	0	1	0	1	0	0	1
5	0	1	0	1	0	0	1
6	1	1	1	1	1	1	1

Our

$$T.C = O(N^2)$$

$$S.C < O(N^2)$$

Approach



row col

index (1,1)

(1,6)

(6,3)

2D → m×n

S.C = O(m+n)

psudo code

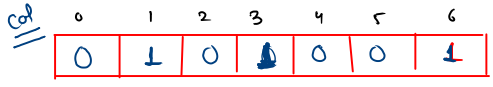
- create 1D array of m size and n size
- traverse in 2D array
  - if arr[i][j] == 1
    - row[i] = 1
      col[j] = 1
      } shadowing

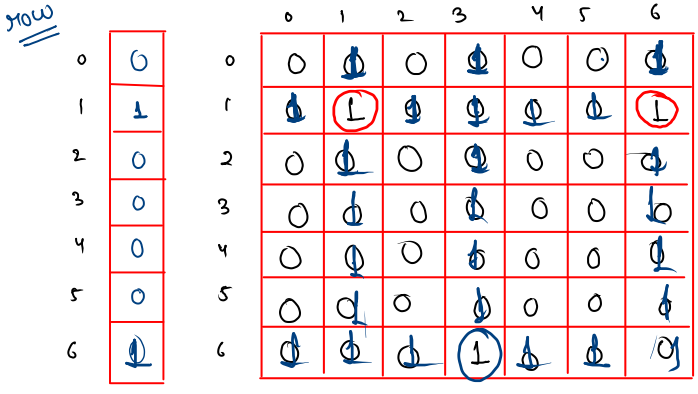
Code

```java
public static void modifyMatrix(int[][] arr, int m, int n) {
    int[] row = new int[m]; // O(m)
    int[] col = new int[n]; // O(n)

    for (int i = 0; i < m; i++) {
        for (int j = 0; j < n; j++) {
            if ( arr[i][j] == 1 ) {
                row[i] = 1;
                col[j] = 1;
            }
        }
    }

    for (int i = 0; i < m; i++) {
        for (int j = 0; j < n; j++) {
            if ( row[i] == 1 || col[j] == 1 ) {
                arr[i][j] = 1;
            }
        }
    }
}
```

store data

use data





⇒ Strings

→ collections of character

str1 = "abcd" ; str2 = "efg"
0 1 2 3

Functions

- size :- str.length();
- concatenate :- str1 + str2
- get a char :- str1.charAt(2);
- substring :-

→ Substring // return a string

```
str = " abcdef " ;
      0 1 2 3 4 5
str.substring ( start_idx , end_index + 1) ;
```

```
str.substring (0, 4)  // abcd
str.substring (2, 5)  // cde
str.substring (0, 5)  // abcde
str.substring (0, 6)  // abcdef
                      ↑ ↑
```

```
str.substring (0, 7) //error
str.substring (start_idx);
str.substring (4) // ef
str.substring (2) // cdef
```

Print Characters

str = "bacZfge"

print :-

b
a
c
Z
f
g
e

Code

```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    String str = scn.next();
    for (int i = 0; i < str.length(); i++) {
        System.out.println( str.charAt(i) );
    }
}
```

Note:-

whenever you are comparing 2 string, never ever use ==, !=

what to use then;

str1.equals(str2);

Is Equal?

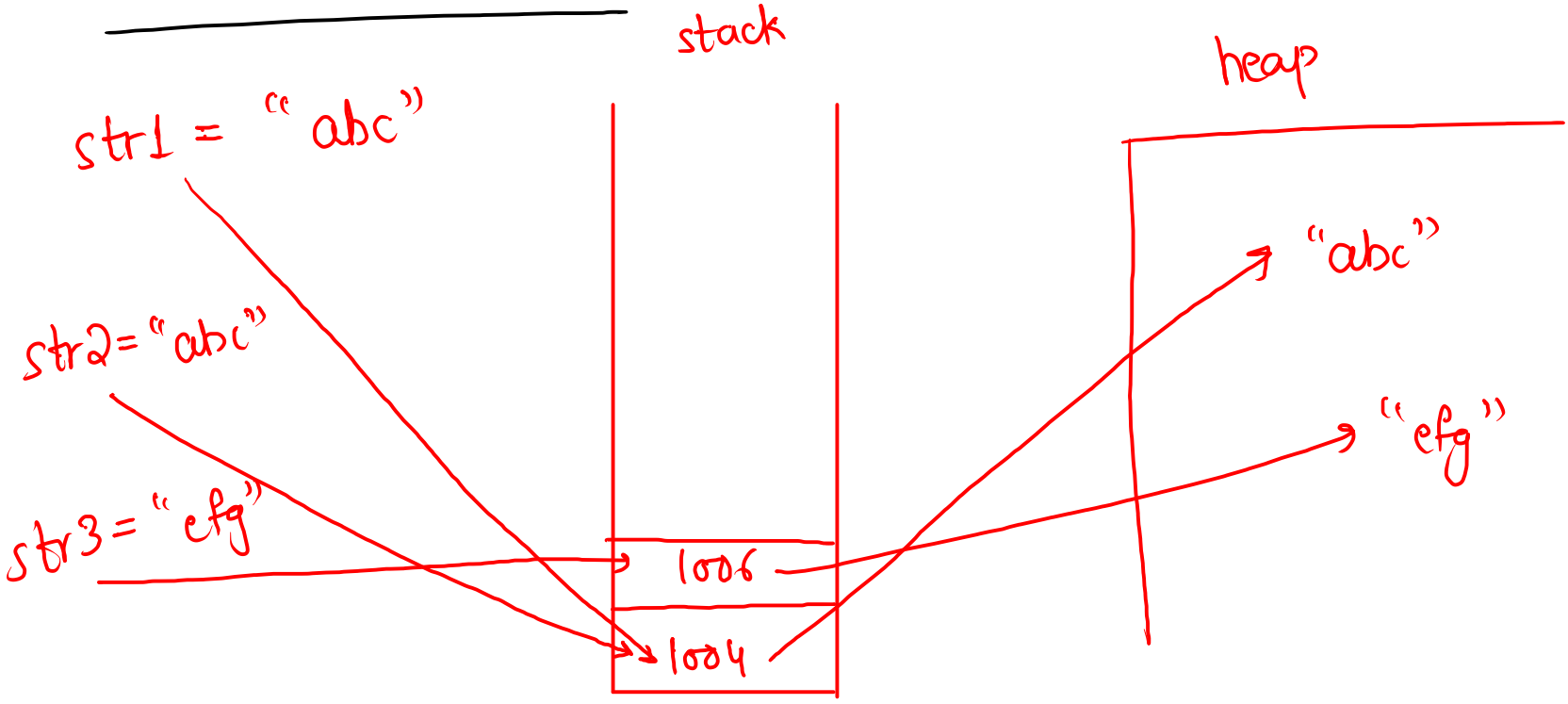
↳ condition

1) length should be equal for both
2) all characters at i^{th} idx should be equal

```java
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    String str1 = scn.nextLine();
    String str2 = scn.nextLine();

    if ( str1.length() == str2.length() ) {
        for ( int i = 0; i < str1.length(); i++ ) {
            if ( str1.charAt(i) != str2.charAt(i) ) {
                System.out.println(false);
                return;
            }
        }
        System.out.println(true);
        return;
    } else {
        System.out.println(false);
        return;
    }
}
```

exp:- in java, string is immutable

2 level arch.



Note:- == compares address and .equal compare value