

Date - 1st Sep, 2023

Problem Statement -

Given an array of **N** integers, and an integer **K**, the task is to find the **number of pairs** of integers in the array whose sum is equal to **K**.

Input - [1,5,7,1,3,3], k=6

Expected output - 3

Step-by-step Explanation-

Step-1 : Let's initialise a variable to count the pairs.

Step-2 : Initialise a parent for loop that iterates over an array on each element.

1. Initialise iterator value with $i = 0$
2. The loop termination condition should be $i < \text{array.length}$
3. The loop expression should be $i++$

Step-3 : Initialise a child for loop that iterates over each element with the parent loop iterator fixed.

1. Initialise it with value $i+1$
2. The loop termination condition should be $j < \text{array.length}$
3. The loop expression should be $j++$

Step-4 : Inside the for loop, make a condition to check if the sum of both the numbers is equal to the given number or not

1. If yes, then increase the count
2. If no, ignore and move forward

Step-5 After the loop gets terminated, return the count and print it.

Home work -

Given an array of **N** integers, and an integer **K**, the task is to find the **number of pairs** of integers in the array whose sum is equal to **Even**.

Given an array of **N** integers with a missing element in it, the sum of the array if the missing element is present is given which is **K**. Can you find that missing element?

Input - [1,2,_,4,5], k=18

Output - 6

Date - 5th Sep, 2023

Problem Statement - You will be given an integer N, by using it, you have to print a pattern as shown below.

Input - N =5

Output -

```
* * * * *  
* * * * *  
* * * * *  
* * * * *  
* * * * *
```

Input - N=3

Output -

```
* * *  
* * *  
* * *
```

Steps to be follow to decode patterns -

1. For the outer loop, count the rows.
2. For the inner loop, count the columns and somehow relate it to the outer loop.
3. Print the pattern inside the inner loop (depending on the situation)
4. Decode the symmetry incase of some patterns.

Step by step approach for the above pattern.

1. As step 1 says, always count the rows in the outer loop, so here there are 5 rows in the first output.
2. Moving forward, as the step 2 says, in the inner loop count the columns and relate it to the outer loop, so there are 5 columns in the pattern and the relation here is no-of rows is equal to no-of columns.
3. Printing the patterns.

Problem Statement - You will be given an integer N, by using it, you have to print a pattern as shown below.

Input - N=5;

Output -

```
*
* *
* * *
* * * *
* * * * *
```

Problem Statement - You will be given an integer N, by using it, you have to print a pattern as shown below.

Input - N=5;

Output -

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

Home work -

Problem Statement - You will be given an integer N, by using it, you have to print the pattern as shown below.

Input - N=5;

```
* * * * *
* * * *
* * *
* *
*
```

```
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

9th Sep, 2023

Problem Statement - You will be given a number N and you have to check whether the number is an Armstrong number or not.

Input - 153

Output - true

Input - 380

Output - false

What is an Armstrong number?

A positive number is said to be an armstrong number if -

$$abcd\dots = a^n + b^n + c^n + d^n + \dots$$

In the case of an Armstrong number of 3 digits, the sum of cubes of each digit is equal to the number itself. For example, 153 is an Armstrong number because

$$153 = 1*1*1 + 5*5*5 + 3*3*3$$

$$1634 = 1*1*1*1 + 6*6*6*6 + 3*3*3*3 + 4*4*4*4$$

Step by step explanation -

1. Initialise 3 variables - result, remainder, originalNum;
2. Initialise a loop
3. Get the last place and so on of the given integer by dividing it with 10;
4. Calculate the sum which is the sum of the cubes of the each integer in the number;
5. Update the number
6. Check whether the calculated sum is equal to given number or not
 1. If yes - return true
 2. If no - return false

Home work

Problem Statement - You will be given a number N and you have to check whether the number is a Prime number or not.

Input - 2

Output - true

Input - 6

Output - false

What is the Prime Number?

A number is said to be a prime number if it is divisible by 1 and itself. Or in particular a number is said to be a prime number if it has exactly 2 factors which are 1 and the number itself.

13th Sep, 2023

Problem Statement - You will be given a number n, find all the factors of that number from 1 to n.

Input - 10

Output - 1,2,5,10

Factors- When a number “a” is completely dividing a number “b”, b is called a factor of a.

Step-by-step

1. We initialise a loop
2. We check whether the number is completely divisible or not.
3. If yes - then print the number else continue.

Problem Statement - You will be given a number N and you have to check whether the number is a Prime number or not.

Input - 2

Output - true

Input - 6

Output - false

What is the Prime Number?

A number is said to be a prime number if it is divisible by 1 and itself. Or in particular a number is said to be a prime number if it has exactly 2 factors which are 1 and the number itself.

Step-by-step explanation

1. Initialise a loop
2. Check for all the factors of the numbers and count those factors
3. Check if the factor count is 2 or not.
4. If yes - then print "Prime" else print "not a prime"

Problem Statement - You are given 2 numbers a and b. Find the GCD of the 2 numbers and print it.

Input - 9, 12

Output - 3

What is GCD?

Greatest common divisor is common divisor which is the highest among all the factors of that 2 numbers that are having in common

Step-by-step

1. Initialise a variable.
2. Initialise a loop.
3. Check for the condition if both the numbers are getting divided completely or not.
4. If yes, then update the variable initialised if not then move forward.

Problem Statement - You will be given a number check whether the number is a palindrome or not.

Input - 121

Output - true

Input - 123

Output - false

Home work -

Problem Statement - You are given with an integer N, find the sum of all divisors of numbers present in between 1 to n.

Input: 'n' = 5

Output: 21

Explanation:

We need to find the sum of 'sumOfDivisors(i)' for all 'i' from 1 to 5.

'sumOfDivisors(1)' = 1

'sumOfDivisors(2)' = 2 + 1 = 3

'sumOfDivisors(3)' = 3 + 1 = 4

'sumOfDivisors(4)' = 4 + 2 + 1 = 7

'sumOfDivisors(5)' = 5 + 1 = 6

Therefore our answer is sumOfDivisors(1) +
sumOfDivisors(2) + sumOfDivisors(3) +
sumOfDivisors(4) + sumOfDivisors(5) = 1 + 3 + 4 + 7 +
6 = 21.

Sep 19th, 2023

Sorting

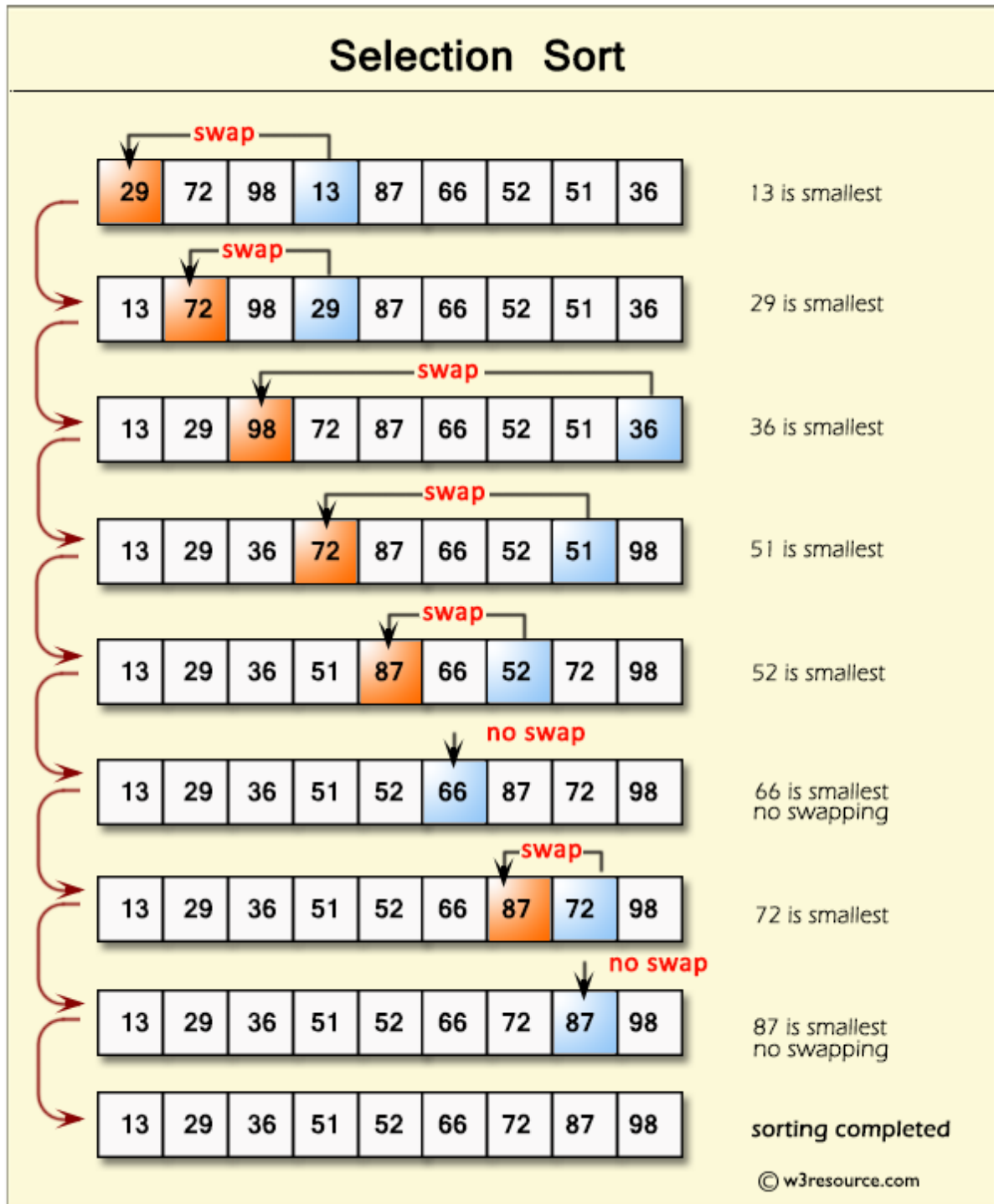
Problem Statement - You will be given an array, and you have to sort the array and print the array.

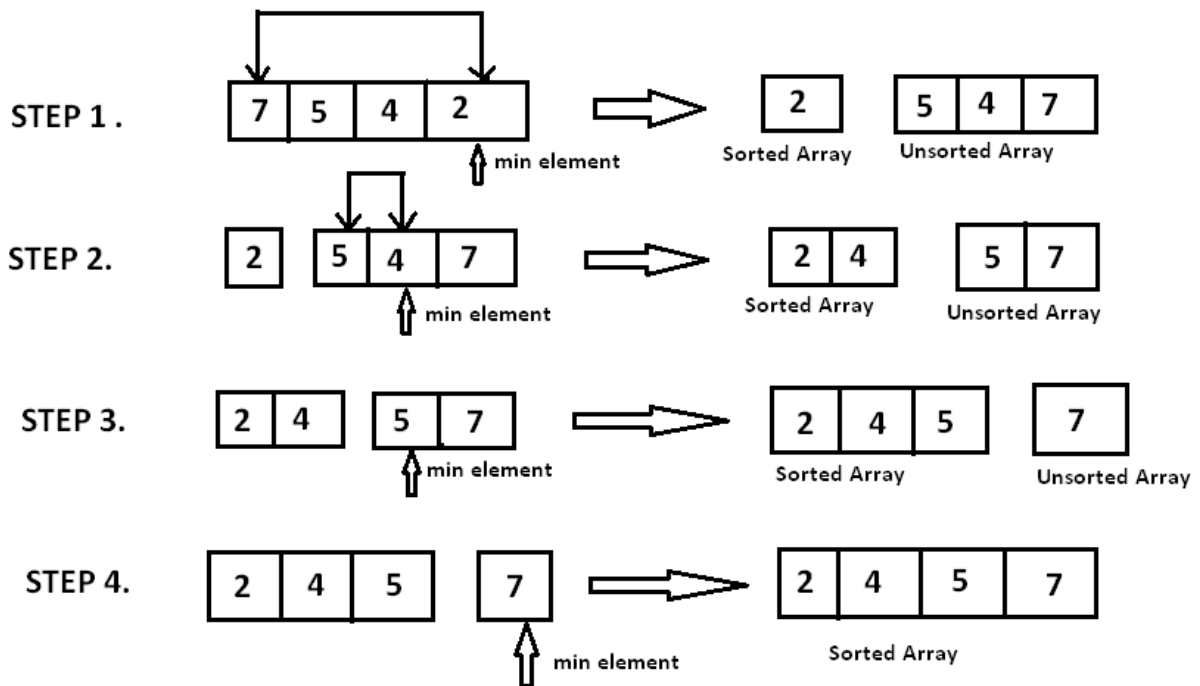
Input - [3,4,1,2,0,-1]

Output - [-1, 0, 1, 2, 3, 4]

Selection Sort

- It is basically selecting the minimum and swap.
- First we make the first index as minimum.
- Then starting from the 1st index we start iterating from the array and check which is the minimum element in the array. When we find a minimum element we just swap its index.
- And we move forward and continue the same process.





CODE

```
let array = [3,4,1,2,0,-1];

let n = array.length;

for(let i =0; i<=n-2;i++){
  let min = i;
  for(let j =i;j<=n-1;j++){
    if(array[j]<array[min]){
      min=j;
    }
  }

  let temp = array[min];
  array[min]=array[i];
  array[i]=temp;
}

console.log(array);
```

