1 . JavaScript array

1. Write a JavaScript function to check whether an `input` is an array or not.
Test Data :
console.log(is_array([1, 2, 4, 0]));
false
true

2. Write a JavaScript function to clone an array.
Test Data :
console.log(array_Clone([1, 2, 4, 0]));
console.log(array_Clone([1, 2, [4, 0]]));
[1, 2, 4, 0]
[1, 2, [4, 0]]

3. Write a JavaScript function to get the first element of an array. Passing a parameter 'n' will return the first 'n' elements of the array.
Test Data :
console.log(first([7, 9, 0, -2]));
console.log(first([],3));
console.log(first([7, 9, 0, -2],3));
console.log(first([7, 9, 0, -2],6));
console.log(first([7, 9, 0, -2],-3));
Expected Output :
7
[]
[7, 9, 0]
[7, 9, 0, -2]
[]

4. Write a JavaScript function to get the last element of an array. Passing a parameter 'n' will return the last 'n' elements of the array.
Test Data :
console.log(last([7, 9, 0, -2]));
console.log(last([7, 9, 0, -2],3));
console.log(last([7, 9, 0, -2],6));
Expected Output :
-2
[9, 0, -2]
[7, 9, 0, -2]

5. Write a simple JavaScript program to join all elements of the following array into a string.
Sample array : myColor = ["Red", "Green", "White", "Black"];
Expected Output :
"Red,Green,White,Black"
"Red,Green,White,Black"
"Red+Green+White+Black"

6. Write a JavaScript program which accept a number as input and insert dashes (-) between each two even numbers. For example if you accept 025468 the output should be 0-254-6-8.

7. Write a JavaScript program to sort the items of an array.
Sample array : var arr1 = [3, 8, 7, 6, 5, -4, 3, 2, 1];
Sample Output : -4,-3,1,2,3,5,6,7,8

8. Write a JavaScript program to find the most frequent item of an array.
Sample array : var arr1=[3, 'a', 'a', 'a', 2, 3, 'a', 3, 'a', 2, 4, 9, 3];
Sample Output : a (5 times)

9. Write a JavaScript program which accept a string as input and swap the case of each character. For example if you input 'The Quick Brown Fox' the output should be 'tHE qUICK bROWN fOX'.

10. Write a JavaScript program which prints the elements of the following array.
Note : Use nested for loops.
Sample array : var a = [[1, 2, 1, 24], [8, 11, 9, 4], [7, 0, 7, 27], [7, 4, 28, 14], [3, 10, 26, 7]];
Sample Output :
"row 0"
" 1"
" 2"
" 1"
" 24"
"row 1"

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11. Write a JavaScript program to find the sum of squares of a numeric vector.

12. Write a JavaScript program to compute the sum and product of an array of integers.

13. Write a JavaScript program to remove duplicate items from an array (ignore case sensitivity).

14. We have the following arrays :
color = ["Blue ", "Green", "Red", "Orange", "Violet", "Indigo", "Yellow "];
o = ["th","st","nd","rd"]
Write a JavaScript program to display the colors in the following way :
"1st choice is Blue ."
"2nd choice is Green."
"3rd choice is Red."
- - - - - - - - - - - - -
Note : Use ordinal numbers to tell their position.

15. Find the leap years in a given range of years.

16. Write a JavaScript program to shuffle an array.

17. Write a JavaScript program to perform a binary search.
Note : A binary search or half-interval search algorithm finds the position of a specified input value within an array sorted by key value.
Sample array :
var items = [1, 2, 3, 4, 5, 7, 8, 9];
Expected Output :
console.log(binary_Search(items, 1)); //0
console.log(binary_Search(items, 5)); //4

18. There are two arrays with individual values, write a JavaScript program to compute the sum of each individual index value from the given arrays.
Sample array :
array1 = [1,0,2,3,4];
array2 = [3,5,6,7,8,13];
Expected Output :
[4, 5, 8, 10, 12, 13]

21. Write a JavaScript program to find duplicate values in a JavaScript array.

21. Write a JavaScript program to flatten a nested (any depth) array. If you pass shallow, the array will only be flattened a single level.
Sample Data :
console.log(flatten([1, [2], [3, [[4]]],[5,6]]));
[1, 2, 3, 4, 5, 6]
console.log(flatten([1, [2], [3, [[4]]],[5,6]], true));
[1, 2, 3, [[4]], 5, 6]

22. Write a JavaScript program to compute the union of two arrays.
Sample Data :
console.log(union([1, 2, 3], [100, 2, 1, 10]));

[1, 2, 3, 10, 100]

23. Write a JavaScript function to find the difference of two arrays.
Sample Data :
console.log(difference([1, 2, 3], [100, 2, 1, 10]));
console.log(difference([1, 2, 3, 4, 5], [1, [2], [3, [[4]]],[5,6]]));
["1", "2", "3", "10", "100"]
["1", "2", "3", "4", "5", "6"]

2. JavaScript conditional statements and loops

[*An editor is available at the bottom of the page to write and execute the scripts*.]

1. Write a JavaScript program that accept two integers and display the larger.

2. Write a JavaScript conditional statement to find the sign of product of three numbers. Display an alert box with the specified sign.

Sample numbers : 3, -7, 2
Output : The sign is -

3. Write a JavaScript conditional statement to sort three numbers. Display an alert box to show the result.
Sample numbers : 0, -1, 4
Output : 4, 0, -1

4. Write a JavaScript conditional statement to find the largest of five numbers. Display an alert box to show the result.
Sample numbers : -5, -2, -6, 0, -1
Output : 0

5. Write a JavaScript for loop that will iterate from 0 to 15. For each iteration, it will check if the current number is odd or even, and display a message to the screen.
Sample Output :
"0 is even"
"1 is odd"
"2 is even"

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6. Write a JavaScript program which compute, the average marks of the following students Then, this average is used to determine the corresponding grade.

Student Name	**Marks**
David	80
Vinoth	77
Divya	88
Ishitha	95
Thomas	68

The grades are computed as follows :

Range	**Grade**
<60	F
<70	D
<80	C
<90	B
<100	A

7. Write a JavaScript program which iterates the integers from 1 to 100. But for multiples of three print "Fizz" instead of the number and for the multiples of five print "Buzz". For numbers which are multiples of both three and five print "FizzBuzz".

8. According to Wikipedia a happy number is defined by the following process :
"Starting with any positive integer, replace the number by the sum of the squares of its digits, and repeat the process until the number equals 1 (where it will stay), or it loops endlessly in a cycle which does not include 1. Those numbers for which this process ends in 1 are happy numbers, while those that do not end in 1 are unhappy numbers (or sad numbers)".
Write a JavaScript program to find and print the first 5 happy numbers.

9. Write a JavaScript program to find the armstrong numbers of 3 digits.
Note : An Armstrong number of three digits is an integer such that the sum of the cubes of its digits is equal to the number itself. For example, 371 is an Armstrong number since 3**3 + 7**3 + 1**3 = 371.

10. Write a JavaScript program to construct the following pattern, using a nested for loop.

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

11. Write a JavaScript program to compute the greatest common divisor (GCD) of two positive integers.

12. Write a JavaScript program to sum the multiples of 3 and 5 under 1000.

3 . JavaScript functions

1. Write a JavaScript function that reverse a number.
Example x = 32243;
Expected Output : 34223

2. Write a JavaScript function that checks whether a passed string is palindrome or not?
A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run.

3. Write a JavaScript function that generates all combinations of a string.
Example string : 'dog'
Expected Output : d,do,dog,o,og,g

4. Write a JavaScript function that returns a passed string with letters in alphabetical order.
Example string : 'webmaster'
Expected Output : 'abeemrstw'
Assume punctuation and numbers symbols are not included in the passed string.

5. Write a JavaScript function that accepts a string as a parameter and converts the first letter of each word of the string in upper case.
Example string : 'the quick brown fox'
Expected Output : 'The Quick Brown Fox '

6. Write a JavaScript function that accepts a string as a parameter and find the longest word within the string.
Example string : 'Web Development Tutorial'
Expected Output : 'Development'

7. Write a JavaScript function that accepts a string as a parameter and counts the number of vowels within the string.
Note : As the letter 'y' can be regarded as both a vowel and a consonant, we do not count 'y' as vowel here.
Example string : 'The quick brown fox'
Expected Output : 5

8. Write a JavaScript function that accepts a number as a parameter and check the number is prime or not.
Note : A prime number (or a prime) is a natural number greater than 1 that has no positive divisors other than 1 and itself.

9. Write a JavaScript function which accepts an argument and returns the type.
Note : There are six possible values that typeof returns: object, boolean, function, number, string, and undefined.

10. Write a JavaScript function which returns the n rows by n columns identity matrix.

11. Write a JavaScript function which will take an array of numbers stored and find the second lowest and second greatest numbers, respectively.

Sample array : [1,2,3,4,5]
Expected Output : 2,4

12. Write a JavaScript function which says whether a number is perfect.
According to Wikipedia : In number theory, a perfect number is a positive integer that is equal to the sum of its proper positive divisors, that is, the sum of its positive divisors excluding the number itself (also known as its aliquot sum). Equivalently, a perfect number is a number that is half the sum of all of its positive divisors (including itself).
Example : The first perfect number is 6, because 1, 2, and 3 are its proper positive divisors, and 1 + 2 + 3 = 6. Equivalently, the number 6 is equal to half the sum of all its positive divisors: (1 + 2 + 3 + 6) / 2 = 6. The next perfect number is 28 = 1 + 2 + 4 + 7 + 14. This is followed by the perfect numbers 496 and 8128.

13. Write a JavaScript function to compute the factors of a positive integer.

14. Write a JavaScript function to convert an amount to coins.
Sample function : amountTocoins(46, [25, 10, 5, 2, 1])
Here 46 is the amount. and 25, 10, 5, 2, 1 are coins.
Output : 25, 10, 10, 1

15. Write a JavaScript function to compute the value of b^n where n is the exponent and b is the bases. Accept b and n from the user and display the result.

16. Write a JavaScript function to extract unique characters from a string.
Example string : "thequickbrownfoxjumpsoverthelazydog"
Expected Output : "thequickbrownfxjmpsvlazydg"

17. Write a JavaScript function to get the number of occurrences of each letter in specified string.

18. Write a function for searching JavaScript arrays with a binary search.
Note : A binary search searches by splitting an array into smaller and smaller chunks until it finds the desired value.

19. Write a JavaScript function that returns array elements larger than a number.

20. Write a JavaScript function that generates a string id (specified length) of random characters.
Sample character list :
"ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789"

21. Write a JavaScript function to get all possible subset with a fixed length (for example 2) combinations in an array.
Sample array : [1, 2, 3] and subset length is 2
Expected output : [[2, 1], [3, 1], [3, 2], [3, 2, 1]]

22. Write a JavaScript function that accepts two arguments, a string and a letter and the function will count the number of occurrences of the specified letter within the string.
Sample arguments : 'w3resource.com', 'o'
Expected output : 2

23. Write a JavaScript function to find the first not repeated character.
Sample arguments : 'abacddbec'
Expected output : 'e'

24. Write a JavaScript function to apply Bubble Sort algorithm.
Note : According to wikipedia "Bubble sort, sometimes referred to as sinking sort, is a simple sorting algorithm that works by repeatedly stepping through the list to be sorted, comparing each pair of adjacent items and swapping them if they are in the wrong order".
Sample array : [12, 345, 4, 546, 122, 84, 98, 64, 9, 1, 3223, 455, 23, 234, 213]
Expected output : [3223, 546, 455, 345, 234, 213, 122, 98, 84, 64, 23, 12, 9, 4, 1]

25. Write a JavaScript function that accept a list of country names as input and returns the longest country name as output.
Sample function : Longest_Country_Name(["Australia", "Germany", "United States of America"])
Expected output : "United States of America"

4 . JavaScript Object

1. Write a JavaScript program to list the properties of a JavaScript object.
Sample object :
var student = {
name : "David Rayy",
sclass : "VI",
rollno : 12 };
Sample Output : name,sclass,rollno

2. Write a JavaScript program to delete the rollno property from the following object. Also print the object before or after deleting the property.
Sample object :
var student = {
name : "David Rayy",
sclass : "VI",
rollno : 12 };

3. Write a JavaScript program to get the length of an JavaScript object
Sample object :
var student = {
name : "David Rayy",
sclass : "VI",
rollno : 12 };

4. Write a JavaScript program to display the reading status (i.e. display book name, author name and reading status) of the following books.

```
var library = [     {        title: 'Bill Gates',        author: 'The
Road Ahead',        readingStatus: true    },    {        title:
'Steve Jobs',        author: 'Walter Isaacson',        readingStatus:
true    },    {        title: 'Mockingjay: The Final Book of The
Hunger Games',        author: 'Suzanne Collins',       readingStatus:
false    }];
```

5. Write a JavaScript program to get the volume of a Cylinder with four decimal places using object classes.
Volume of a cylinder : $V = \pi r^2 h$
where r is the radius and h is the height of the cylinder.

6. Write a Bubble Sort algorithm in JavaScript.
Note : Bubble sort is a simple sorting algorithm that works by repeatedly stepping through the list to be sorted,
Sample Data : [6,4,0, 3,-2,1]
Expected Output : [-2, 0, 1, 3, 4, 6]

7. Write a JavaScript program which returns a subset of a string.
Sample Data : dog
Expected Output : ["d", "do", "dog", "o", "og", "g"]

8. Write a JavaScript program to create a Clock.
Note : The output will come every second.
Expected Console Output :
"14:37:42"
"14:37:43"
"14:37:44"
"14:37:45"
"14:37:46"
"14:37:47"

9. Write a JavaScript program to calculate the area and perimeter of a circle.