# Lab: Unit Testing with Mocha

Problems for exercises and homework for the [“JavaScript Fundamentals” course @ SoftUni](https://softuni.bg/trainings/2080/js-fundamentals-september-2018). Submit your solutions in the SoftUni judge system at <https://judge.softuni.bg/Contests/307/>.

# Error Handling

## Sub Sum

Write a JS function to sum a **range** of numeric elements from array. The function takes three parameters – the first is an **array**, the second is **start index** and the third is an **end index**. Both indexes are **inclusive**. Assume array elements may not be of type Number and cast everything. Implement the following error handling:

* if the **first element** is not an array, return NaN
* if the **start index** is less than zero, assume it is zero
* if the **end index** is outside the bounds of the array, assume it points to the last index of the array

### Input / Output

Your function must take three **parameters**. As output, **return** the resulting **sum** as instructed.

### Examples

|  |  |
| --- | --- |
| Sample Input | Sample Output |
| subsum([10, 20, 30, 40, 50, 60], 3, 300) | 150 |
| subsum([1.1, 2.2, 3.3, 4.4, 5.5], -3, 1) | 3.3 |
| subsum([10, 'twenty', 30, 40], 0, 2) | NaN |
| subsum([], 1, 2) | 0 |
| subsum('text', 0, 2) | NaN |

## Playing Cards

Create a JS **factory function** that returns a **Card** object to hold a card’s face and suit, both set trough the constructor. **Throw** an error if the card is initialized with invalid **face** or **suit** or if an attempt is made to change the **face** or **suit** of an existing instance to an invalid value.

* Valid card faces are: 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K, A
* Valid card suits are: S (♠), H (♥), D (♦), C (♣)

Both face and suit are expected as an uppercase string. The class also needs to have a toString() method that prints the card’s face and suit as a string. Use the following UTF code literals to represent the suits:

* \u2660 – Spades (♠)
* \u2665 – Hearts (♥)
* \u2666 – Diamonds (♦)
* \u2663 – Clubs (♣)

### Input / Output

The factory function must take two string parameters. The toString() method of the returned object must return a string.

Submit the factory function.

### Examples

|  |  |
| --- | --- |
| Sample Input | Sample Output |
| console.log('' + makeCard('A', 'S')); | A♠ |
| console.log('' + makeCard('10', 'H')); | 10♥ |
| console.log('' + makeCard('1', 'C')); | Error |

## Deck of Cards

Write a JS function that takes a deck of cards as a string array and prints them as a sequence of cards (space separated). Print "Invalid card: [card]" when an invalid card definition is passed as input. Use the solution from the previous task to generate the cards.

### Input / Output

The function must take an array of strings as parameter. As output, print on the console the list of cards as strings, separated by space.

Submit a function that contains the makeCard factory function and other logic.

|  |
| --- |
| deck.js |
| function printDeckOfCards(cards) {  function makeCard {  *// TODO use function definition from previous task*  }  *// TODO process input*  } |

### Examples

|  |  |
| --- | --- |
| Sample Input | Sample Output |
| printDeckOfCards(['AS', '10D', 'KH', '2C']); | A♠ 10♦ K♥ 2♣ |
| printDeckOfCards(['5S', '3D', 'QD', '1C']); | Invalid card: 1C |

# Unit Testing

The Unit Tests with Sinon and Mocha strategy gives you access to the following libraries to help you test your code - Mocha, Sinon, Chai, Sinon-Chai and jQuery.

You are required to **only submit the unit tests** for the object/function you are testing. The strategy provides access to Chai's **expect**, **assert** and **should** methods and jQuery.

### Example Submission





## Sum of Numbers

Write Mocha tests to check the functionality of the following JS code:

|  |
| --- |
| rgb-to-hex.js |
| **function** *sum*(arr) {  **let** sum = 0;  **for** (num **of** arr)  sum += Number(num);  **return** sum; } |

Your tests will be supplied a function named 'sum'. It needs to meet the following requirements:

* Takes an **array** of **numbers** as argument
* **Returns** the **sum** of the values of all elements inside the array

## Check for Symmetry

Write Mocha tests to check the functionality of the following JS code:

|  |
| --- |
| rgb-to-hex.js |
| **function** *isSymmetric*(arr) {  **if** (!Array.isArray(arr))  **return false**; *// Non-arrays are non-symmetric* **let** reversed = arr.slice(0).reverse(); *// Clone and reverse* **let** equal = (JSON.stringify(arr) == JSON.stringify(reversed));  **return** equal; } |

Your tests will be supplied a function named 'isSymmetric'. It needs to meet the following requirements:

* Takes an **array** as argument
* **Returns** **false** for any input that isn’t of the **correct type**
* **Returns** **true** if the input array is **symmetric** (first half is the same as the second half mirrored)
* Otherwise, returns **false**

## RGB to Hex

Write Mocha tests to check the functionality of the following JS code:

|  |
| --- |
| rgb-to-hex.js |
| **function** *rgbToHexColor*(red, green, blue) {  **if** (!Number.isInteger(red) || (red < 0) || (red > 255))  **return** undefined; *// Red value is invalid* **if** (!Number.isInteger(green) || (green < 0) || (green > 255))  **return** undefined; *// Green value is invalid* **if** (!Number.isInteger(blue) || (blue < 0) || (blue > 255))  **return** undefined; *// Blue value is invalid* **return "#"** +  (**"0"** + red.toString(16).toUpperCase()).slice(-2) +  (**"0"** + green.toString(16).toUpperCase()).slice(-2) +  (**"0"** + blue.toString(16).toUpperCase()).slice(-2); } |

Your tests will be supplied a function named 'rgbToHexColor', which takes three arguments. It needs to meet the following requirements:

* Takes three **integer numbers**, representing the red, green and blue values of an RGB color, each **within range [0…255]**
* **Returns** the same color in hexadecimal format as a **string** (e.g. '#FF9EAA')
* **Returns** 'undefined' if **any** of the input parameters are of **invalid type** or not in the expected **range**

## Add / Subtract

Write Mocha tests to check the functionality of the following JS code:

|  |
| --- |
| rgb-to-hex.js |
| **function** *createCalculator*() {  **let** value = 0;  **return** {  add: **function**(num) { value += Number(num); },  subtract: **function**(num) { value -= Number(num); },  get: **function**() { **return** value; }  } } |

Your tests will be supplied a function named 'createCalculator'. It needs to meet the following requirements:

* **Returns** a **module** (object), containing the functions add, subtract and get as **properties**
* Keeps an **internal sum** which **can’t be modified** from the outside
* The functions add and subtract take a parameter that can be parsed as a number (either a number or a string containing a number) that is added or subtracted from the **internal sum**
* The function get **returns** the value of the **internal sum**