Exercises: Classes and Their Members

Problems for exercises and homework for the "JavaScript Advanced" course @ SoftUni. Submit your solutions in the SoftUni judge system at https://judge.softuni.bg/Contests/336/.

1. Rectangle

Write a JS **class** for a rectangle object. It needs to have a **width** (Number), **height** (Number) and **color** (String) properties, which are set from the constructor and a `calcArea()` method, that calculates and **returns** the rectangle's area.

Input

The constructor function will receive valid parameters.

Output

The `calcArea()` method should **return** a number.

Submit the class definition as is, **without** wrapping it in any function.

Examples

Sample Input	Output

`let rect = new Rectangle(4, 5, 'red');`
`console.log(rect.width);`
`console.log(rect.height);`
`console.log(rect.color);`
`console.log(rect.calcArea());`
	
	4
	5
	Red
	20

2. Person

Write a JS **class** that represents a personal record. It has the following properties, all set from the constructor:

- `firstName`
- `lastName`
- `age`
- `email`

And a method `toString()`, which prints a summary of the information. See the example for formatting details.

Input

The constructor function will receive valid parameters.

Output

The `toString()`method should **return** a string.

Submit the class definition as is, **without** wrapping it in any function.

Examples

Sample Input

`let person = new Person('Maria', 'Petrova', 22, 'mp@yahoo.com');`
`console.log(person);`

Output
`Maria Petrova (age: 22, email: mp@yahoo.com)`

3. Get Persons

Write a JS function that returns an array of Person objects. Use the class from the previous task, create the following instances, and return them in an array:

First Name	Last Name	Age	Email
Maria	Petrova	22	mp@yahoo.com
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Stephan	Nikolov	25	
Peter	Kolev	24	ptr@gmail.com

For any empty cells, do not supply a parameter (call the constructor with less parameters).

Input / Output

There will be **no input**, the data is static and matches the table above. As **output**, **return an array** with Person **instances**.

Submit a function that returns the required output.

4. Circle

Write a JS **class** that represents a **Circle**. It has only one data property – it's **radius**, and it is set trough the **constructor**. The class needs to have **getter** and **setter** methods for its **diameter** – the setter needs to calculate the radius and change it and the getter needs to use the radius to calculate the diameter and return it.

The circle also has a getter **`area()`**, which calculates and **returns** its area.

Input

The constructor function and diameter setter will receive valid parameters.

Output

The **`diameter()`** and **`area()`** getters should **return** numbers.

Submit the class definition as is, **without** wrapping it in any function.

Examples

Sample Input	Output

`let c = new Circle(2);`
`console.log(`Radius: ${c.radius}`);`
`console.log(`Diameter: ${c.diameter}`);`
`console.log(`Area: ${c.area}`);`
`c.diameter = 1.6;`
`console.log(`Radius: ${c.radius}`);`
`console.log(`Diameter: ${c.diameter}`);`
`console.log(`Area: ${c.area}`);`
	
	2
	4
	12.566370614359172
	
	0.8
	1.6
	2.0106192982974678

5. Point Distance

Write a JS **class** that represents a **Point**. It has **x** and **y** coordinates as properties, that are set through the constructor, and a **static method** for finding the distance between two points, called **`distance()`**.

Input

The **`distance()`** method should receive two **Point** objects as parameters.

Output

The **`distance()`** method should **return** a number, the distance between the two point parameters.

Submit the class definition as is, **without** wrapping it in any function.

Examples

Sample Input	Output

`let p1 = new Point(5, 5);`
`let p2 = new Point(9, 8);`
`console.log(Point.distance(p1, p2));`
	
	5

6. Cards

You need to write an **IIFE** that results in an object containing two properties **`Card`** which is a class and **`Suits`** which is an object that will hold the possible suits for the cards.

The **`Suits`** object should have exactly these 4 properties:

- **SPADES** : ♠
- **HEARTS** : ♥
- **DIAMONDS** : ♦
- **CLUBS** : ♣

Where the key is **SPADES**, **HEARTS** e.t.c. and the value is the actual symbol ♠, ♥ and so on.

The **`Card`** class should allow for creating cards, each card has 2 properties **face** and **suit**. The **valid** faces are the following **`["2", "3", "4", "5", "6", "7", "8", "9", "10", "J", "Q", "K", "A"]`** any other are considered invalid.

The **Card** class should have **`setters`** and **`getters`** for the **face** and **suit** properties, when creating a card or setting a property validations should be performed, if an invalid face or a suit not in the **`Suits`** object is passed an **`Error`** should be **thrown**.

Code Template

You are required to write and submit an **IIFE** which results in an object containing the above mentioned **`Card`** and **`Suits`** as properties. Here is an example template you can use:

cards.js

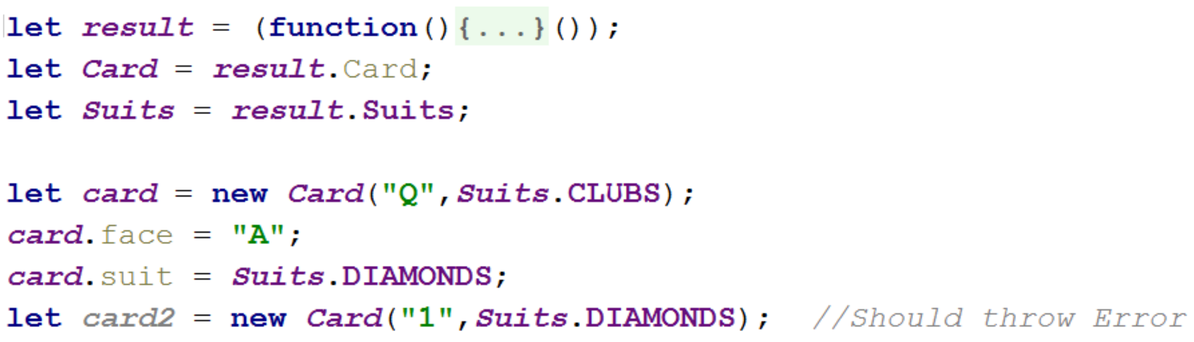
```
(function(){

    // TODO

    return {
        Suits:Suits,
        Card:Card
    }
}())
```

Screenshot

An example usage should look like this:



```
let result = (function(){...}());
let Card = result.Card;
let Suits = result.Suits;

let card = new Card("Q",Suits.CLUBS);
card.face = "A";
card.suit = Suits.DIAMONDS;
let card2 = new Card("1",Suits.DIAMONDS);   //Should throw Error
```