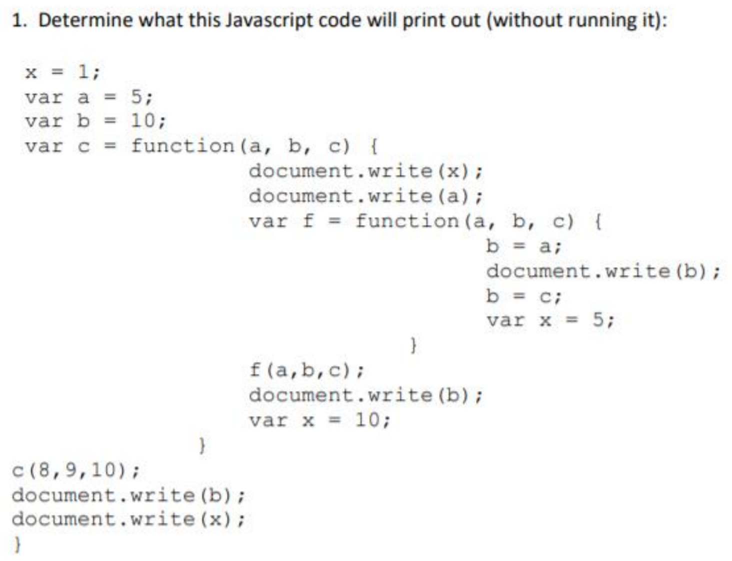
Javascript Module Exercises



1. Determine what this Javascript code will print out (without running it):

```
 x = 1;
 var a = 5;
 var b = 10;
 var c = function(a, b, c) {
                  document.write(x);
                  document.write(a);
                  var f = function(a, b, c) {
                                    b = a;
                                    document.write(b);
                                    b = c;
                                    var x = 5;
                              }
                  f(a,b,c);
                  document.write(b);
                  var x = 10;
              }
c(8,9,10);
document.write(b);
document.write(x);
}
```

Answer :

Undefined

8

8

9

10

1

2. Define *Global Scope* and *Local Scope* in Javascript.

Global Scope: is the scope that accessible and visible in all other scopes. In java script it is generally the webpage where all the code is executed.

Local scope: when we create function it creates its own scope, this is the local scope any variable defined there is only accessible with this scope. It may be one of the following:

1- Block scope: its accessibility between two curly brackets (use let and const)
2- Function scope: accessible inside function (var)

3. Consider the following structure of Javascript code:

```
// Scope A
function XFunc () {
      // Scope B
      function YFunc () {
            // Scope C
      };
};
```

(a) Do statements in Scope A have access to variables defined in Scope B and C?
(b) Do statements in Scope B have access to variables defined in Scope A?
(c) Do statements in Scope B have access to variables defined in Scope C?
(d) Do statements in Scope C have access to variables defined in Scope A?
(e) Do statements in Scope C have access to variables defined in Scope B?

a- No
b- Yes
c- No
d- Yes
e- Yes

4. What will be printed by the following (answer without running it)?

```
var x = 9;
function myFunction() {
    return x * x;
}
document.write(myFunction());
x = 5;
document.write(myFunction());
```

Answer :

81

25

5.
```
var foo = 1;
function bar() {
        if (!foo) {
                var foo = 10;
        }
        alert(foo);
}
bar();
```

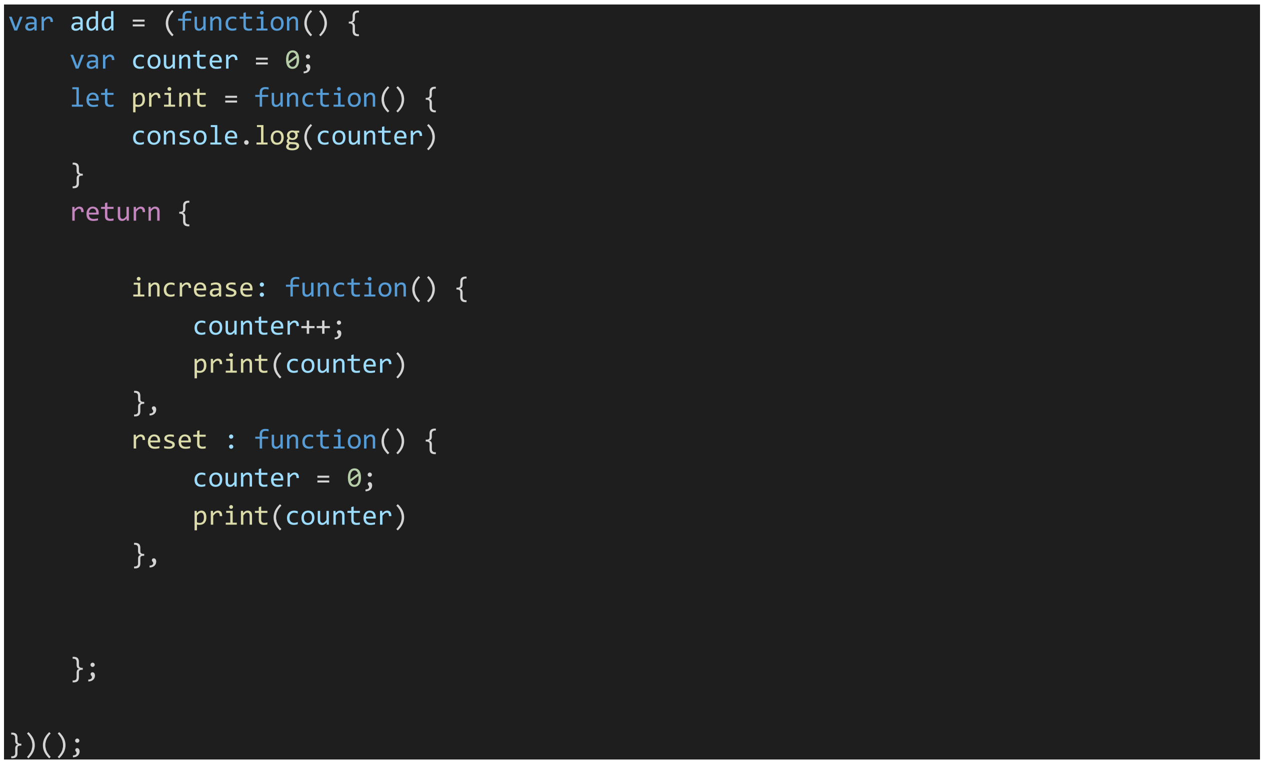
What will the *alert* print out? (Answer without running the code. Remember 'hoisting'.)?

Answer: 10

6. Consider the following definition of an *add*( ) function to increment a *counter* variable:

```
var add = (function () {
    var counter = 0;
    return function () {
            return counter += 1;
            }
    })();
```

Modify the above module to define a *count* object with two methods: *add*( ) and *reset*( ). The *count.add*( ) method adds one to the *counter* (as above). The *count.reset*( ) method sets the *counter* to 0.

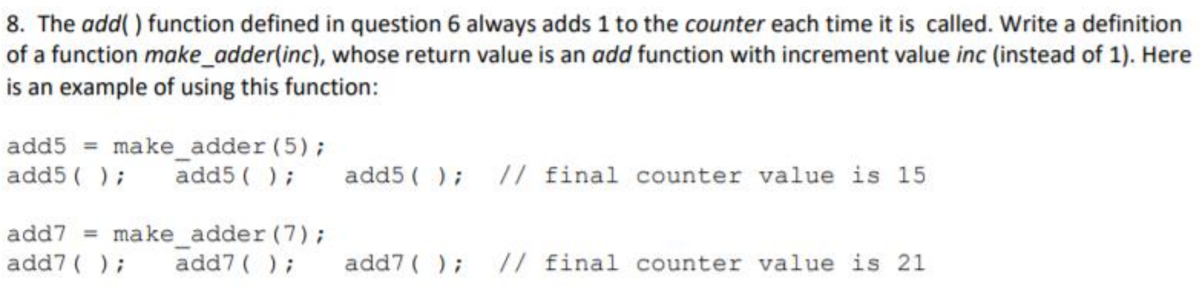


```
var add = (function() {
    var counter = 0;
    let print = function() {
        console.log(counter)
    }
    return {

        increase: function() {
            counter++;
            print(counter)
        },
        reset : function() {
            counter = 0;
            print(counter)
        },


    };

})();
```

7. In the definition of *add*( ) shown in question 6, identify the "free" variable. In the context of a function closure, what is a "free" variable?

Answer: free variable is "**counter**"

Free variable: A variable referred to by a function that is not one of its parameters or local variables.

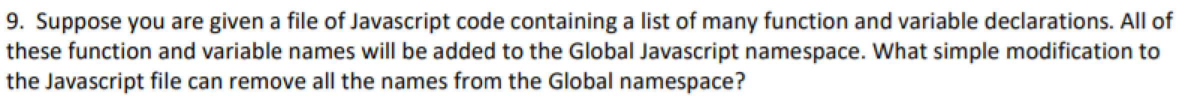


8. The *add*( ) function defined in question 6 always adds 1 to the *counter* each time it is called. Write a definition of a function *make_adder*(*inc*), whose return value is an *add* function with increment value *inc* (instead of 1). Here is an example of using this function:

```
add5 = make_adder(5);
add5( );    add5( );    add5( );   // final counter value is 15

add7 = make_adder(7);
add7( );    add7( );    add7( );   // final counter value is 21
```

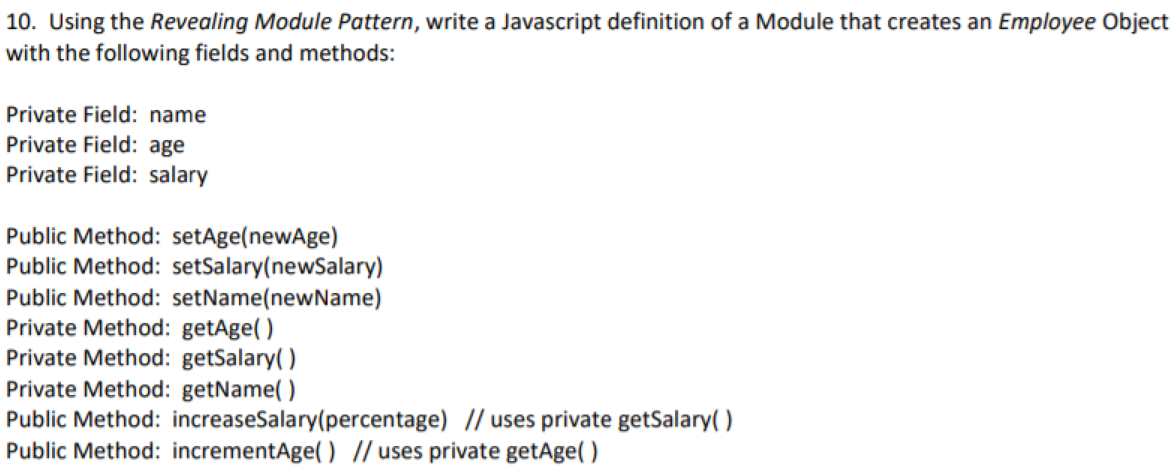
//the method will be added to the return of the add module

```
   var make_adder = function (increment) {
        var counter = 0;
        return function () {
            return counter += increment;
        }
      };

      var add5 =make_adder(5);
      add5();
      add5();
      add5();
```



9. Suppose you are given a file of Javascript code containing a list of many function and variable declarations. All of these function and variable names will be added to the Global Javascript namespace. What simple modification to the Javascript file can remove all the names from the Global namespace?

Answer: by using module pattern



10. Using the *Revealing Module Pattern*, write a Javascript definition of a Module that creates an *Employee* Object with the following fields and methods:

Private Field: name
Private Field: age
Private Field: salary

Public Method: setAge(newAge)
Public Method: setSalary(newSalary)
Public Method: setName(newName)
Private Method: getAge( )
Private Method: getSalary( )
Private Method: getName( )
Public Method: increaseSalary(percentage) // uses private getSalary( )
Public Method: incrementAge( ) // uses private getAge( )

Answer:

```
var empModule = (function() {
    var name
    var age
    var salary

    var getAge = function getAge() {
        return age;
    }
    var getName = function getAge() {
        return name;
    }
    var getSalary = function getAge() {
        return salary;
    }

    var setAge = function (age) {
        this.age = age;
    }

    var setName = function (name) {
        this.name = name;
    }

    var setSalary = function (salary) {
        this.salary = salary;
    }

    var increaseSalary = function (percent) {
        setSalary(getSalary * (1 + percent / 100))

    }

    var incrementAge = function (years) {
        setAge(getAge + years)
    }

    var print = function () {
        var n = getName
        console.log("name" + n + "age" + getAge + "salary" + getSalary)
    }

    return {
        setAge: setAge,
        setName: setName,
        setSalary: setName,
        increaseSalary: increaseSalary,
        incrementAge: incrementAge,
        print: print
    }
})()
```

11. Rewrite your answer to Question 10 using the *Anonymous Object Literal Return Pattern*.

```
var ModuleAnonymous = (function() {
    var name
    var age
    var salary

    var getAge = function() {
        return age;
    }
    var getName = function () {
        return name;
    }
    var getSalary = function () {
        return salary;
    }

    return {
        setAge: function (age) {
            this.age = age;
        },
        setName: function (name) {
            this.name = name;
        },
        setSalary: function (salary) {
            this.salary = salary;
        },
        increaseSalary: function (percent) {
            setSalary(getSalary * (1 + percent / 100))

        },
        incrementAge: function (years) {
            setAge(getAge + years)
        },

        print: function print() {
            var n = getName
            console.log("name" + n + "age" + getAge + "salary" + getSalary)
        }
    };
})();
```

12. Rewrite your answer to Question 10 using the *Locally Scoped Object Literal Pattern*.

```
var stacked = (function() {
    var name
    var age
    var salary

    var getAge = function() {
        return age;
    }
    var getName = function() {
        return name;
    }
    var getSalary = function() {
        return salary;
    }
    var emp = {
        setAge: function(aage) {
            age = aage;
        },
        setName: function(naame) {
            name = naame;
        },
        setSalary: function(saalary) {
            salary = saalary;
        },
        increaseSalary: function(percent) {
            this.setSalary(getSalary * (1 + percent / 100))

        },
        incrementAge: function(years) {
            this.setAge(getAge + years)
        },

        print: function() {
            var n = getName
            console.log("name" + name + "age" + age + "salary" + salary)
        }

    }
    return emp;

})();
```

13. Write a few Javascript instructions to extend the Module of Question 10 to have a public *address* field and public methods *setAddress*(*newAddress*) and *getAddress*( ).

```
empModule.address;
empModule.setAddress = function(newAddress) {
    return address = newAddress;
};
empModule.getAddress = function() {
    return address;
}
```

14. What is the output of the following code?

```
const promise = new Promise((resolve, reject) => {
      reject("Hattori");
});

promise.then(val => alert("Success: " + val))
       .catch(e => alert("Error: " + e));
```

Answer: Error : Hattori

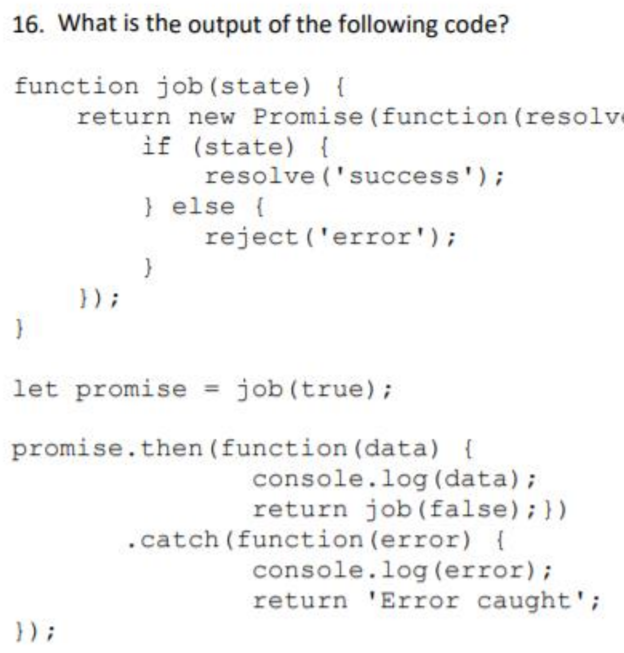
15. What is the output of the following code?

```
const promise = new Promise((resolve, reject) => {
      resolve("Hattori");
      setTimeout(()=> reject("Yoshi"), 500);
});

promise.then(val => alert("Success: " + val))
       .catch(e => alert("Error: " + e));
```

Answer:

it will show Success Hattori,

the reason is that resolve method is called before reject method.



16. What is the output of the following code?

```
function job(state) {
    return new Promise(function(resolve, reject) {
        if (state) {
            resolve('success');
        } else {
            reject('error');
        }
    });
}

let promise = job(true);

promise.then(function(data) {
               console.log(data);
               return job(false);})
       .catch(function(error) {
               console.log(error);
               return 'Error caught';
});
```

Answer :

success

error