

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 : a scope which defines the global environment for function and variables

Local Scope: the inner scope defined by a function to determine the visibility and accessibility of variables

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?

Answer: B,D,E

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

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

Answer: 10

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

```
var count = (function() {
  var counter = 2;
  var add = function() {
    return counter += 1;
  }
  var reset = function(){
    return counter;
  }

  return{
```

```

        add:add
    }

    return{
        reset:reset
    }

}());

```

- 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:

COUNTER is the free variable

Free variable are those variables which are not locally defined inside the closure function or not passed as a parameter to the closure but can be used by the closure.

- 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:

```

9  function make_adder(inc){
10      var counter = 0;
11      var add = function() {
12          return counter += inc;
13      }
14
15      return add;
16  }
17
18  add5 = make_adder(5);
19  console.log(add5( )); console.log(add5( )); console.log(add5(
20  )); // final counter value is 15
21  add7 = make_adder(7);
22  console.log( add7()); console.log( add7()); console.log( add7());
23  // final counter value is 21

```

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:

The simplest modification to do would be to use module pattern, wrapping the the entire code construction inside an anonymous function.

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

```
var Employee = function(){  
  
    var name;//private field  
    var age;//private field  
    var salary;//private field  
  
    //public method  
    function setAge(newAge){  
        age = newAge;  
    }  
    //public method  
    function setSalary(newSalary){  
        salary = newSalary;  
    }  
    //public method  
    function setName(newName)  
    {  
        name = newName;  
    }  
    //private method  
    function getAge( )  
    {  
        return age;  
    }  
    //private method  
    function getSalary()  
    {  
        return salary;  
    }  
    //private method  
    function getName(){  
        return salary;  
    }  
}
```

```

    }
    //public method
    function increaseSalary(percentage)
    {
        return getSalary + (getSalary * percentage);
    }

    // uses private getSalary( )
    //public method
    function incrementAge( ){

        return getAge()+=1;

    } // uses private getAge(

    return {
        setAge:setAge,
        setName:setName,
        setSalary:setSalary,
        increaseSalary:increaseSalary,
        incrementAge:incrementAge
    }

}();

```

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

```

Var Employee = function(){
    var name;//private field
    var age;//private field
    var salary;//private field
    //private method
    function getAge( )
    {
        return age;
    }
    //private method
    function getSalary()
    {
        return salary;
    }
    //private method
    function getName(){

```

```

        return salary;
    }
    //another variation of returning: Anonymous object literal
    return {
        setAge : function(newAge){
            age = newAge;
        },
        setName : function(newName){
            name = newName;
        },
        setSalary : function(newSalary){
            age = newAge;
        },
        increaseSalary: function(percentage)
        {
            return getSalary + (getSalary * percentage);
        },

        // uses private getSalary( )
        //public method
        incrementAge: function ( ){

            return getAge()+=1;
        } // uses private getAge(
    }

}();

```

12. Rewrite your answer to Question 10 using the Locally scoped object literal Object Literal Pattern

```

13.     var Employee = function(){
14.
15.         var name;//private field
16.         var age;//private field
17.         var salary;//private field
18.
19.         let empObject = {};
20.
21.         //private method
22.         function getAge( )
23.         {
24.             return age;
25.         }
26.         //private method

```

```

27.     function getSalary()
28.     {
29.         return salary;
30.     }
31.     //private method
32.     function getName(){
33.         return salary;
34.     }
35.
36.     empObject.setAge = function (){
37.         age = newAge;
38.     }
39.
40.     empObject.setName = function (){
41.         age = newName;
42.     }
43.     empObject.setSalary = function (){
44.         age = newSalary;
45.     }
46.
47.     empObject.increaseSalary = function (){
48.         return getSalary + (getSalary * percentage);
49.     }
50.     empObject.incrementAge = function() {
51.
52.         return getAge()+=1;
53.
54.     }
55.     Return empObject;
56.     }();

```

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().

```

Employee.extension = function (){
    var address;
    function setAddress(newAddress)
    {
        address = newAddress;
    }

    function getAddress (){

```

```

        return address;
    }

    return{
        address:address,
        setAddress:setAddress,
        getAddress:getAddress
    }
}

```

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) => {
    reject("Hattori");

    setTimeout(()=> reject("Yoshi"), 500);

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

```

Answer : Error: Hattori

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