JavaScript Scope 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) {
                    var x = 10;
                    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);
                }
c(8,9,10);
document.write(b);
document.write(x);
}
```

Output

10 8 8 9 10 1

2. What is the difference between a method and function?

A function is a block of code written to perform some specific set of tasks. We can define a function using the function keyword, followed by Name and optional parameters. Body of function is enclosed in Curly braces.
A function can be called directly by its name.

A method is a property of an object that contains a function definition. Methods are functions stored as object properties.
A method consists of a code that can be called by the name of its object and its method name using dot notation or square bracket notation.

3. What does 'this' refer to when used in a Java method?
   'this' keyword in java is a reference variable that refers to the current object.

4. What does 'this' refer to when used in a JavaScript method?
   'this' keyword in JavaScript is a property of an execution context. It refers to the object it belongs to. Its main use is in functions and constructors.

5. What does 'this' refer to when used in a JavaScript constructor function?

In a constructor function this does not have a value. It is a substitute for the new object. The value of this will become the new object when a new object is created.

6. Assume object *x* is the prototype for object *y* in Javascript. Object *x* has a method *f*( ) containing keyword 'this'. When *f* is called by *x*.*f*( ), what does 'this' refer to?

this refers to x

7. What is a free variable in JavaScript?

Free variables are simply the variables that are neither locally declared nor passed as parameter.

8. Create an object that has properties with name = "fred" and major="music"and a property that is a function that takes 2 numbers and returns the smallest of the two, or the square of the two if they are equal.

```
var obj = (() => {
        return {
          name: "fred",
          major: "music",
          smallest: (num1, num2) => {
            if (num1 === num2) {
              return ((num1+num2) * (num1+num2));
            } else if ((num1 < num2)) {
              return num1;
            } else {
              return num2;
            }
          }
        }
      })();
```

9. Write Javascript code for creating three *Employee* objects using the "new" keyword and a constructor function. *Employee* objects have the following fields: name, salary, position.

```
function Employee (name, salary, position){
  this.name = name;
  this.salary = salary;
  this.position = position;
}
var emp1 = new Employee("Seid", 150000, "Software Engineer");
var emp2 = new Employee("Sol", 90000, "Software Developer");
var emp3 = new Employee("Henok", 200000, "Lead Engineer");
```

10. Write a Javascript function that takes any number of input arguments and returns the product of the arguments.

```
function product(...nums){
  var result = 1;
  for(var i=0; i<nums.length; i++){
    result *= nums[i];
  }
  return result;
}
```

11. Write an arrow function that returns the maximum of its three input arguments.

```
var max = (num1, num2, num3) => {
      return Math.max(num1, num2, num3);
      }
```