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);
```

Answer: undefined 8 8 9 10 1

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

Answer: 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 method is a property of an object that contains a function definition. Methods are functions stored as object properties.

3. What does 'this' refer to when used in a Java method?
Answer: The this keyword refers to the current object in a method or constructor.

4. What does 'this' refer to when used in a JavaScript method?
Answer: When a method is called as a property of an object, then this refers to the parent object

5. What does 'this' refer to when used in a JavaScript constructor function?
Answer: When a function is called with the new operator, then this refers to the newly created instance

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?

    Answer: `in this case this referes to object x`

7. What is a free variable in JavaScript?

    Answer: `free variable refers to variables used in a function that are`
    `not local variables nor parameters of that function.`

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.

    Answer:
```
obj = {name:"fred", major:"music",
    func: function(x, y) {
            if(x===y) {
              return (x+y) * (x+y);
            } else {
                    return ((x > y) ? y : x);
            }
        }};
```

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.

    Answer:
```
function Employee(name, salary, position) {
        this.name = name;
        this.salary = salary;
        this.position = position;
    }
    var emp1 = new Employee("Mat", 50000, "Backend Engineer");
    var emp2 = new Employee("Ana", 80000, "Frontend Engineer");
    var emp3 = new Employee("Steve", 20000, "Accountant");
```

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

    Answer:
```
function product(...args) {
            var p = 1;
            for(let i = 0; i<args.length; i++) {
                    p *= args[i]
            }
            return p;
    }
```

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

    Answer: `(x, y, z) => { return (x > y) ? ((x > z) ? x : z) : ((y > z) ? y`
    `: z)`