```
<script>
/*
     CSCI-111 Web Programming and Problem Solving
*/
function week_7_lecture(session)
{
     console.log("JavaScript Functions")
     const instructors = ["Dr. Talgat Manglayev", "Dr. Irina Dolzhikova", "MSc. Marat Isteleyev"]
     console.log(instructors[session - 1])
}


week_7_lecture(1)

</script>
```

Content

- Comparison
- Logical operators
- Functions
  - Function declaration and call
  - Arguments and parameters
  - Scope

1.html, 2.html

Comparison

Greater than	a > b
Lower than	a < b
Greater than or equal to	a >= b
Lower than or equal to	a <= b

1.html, 2.html

Comparison

Equal value	a == b
Value and data type are equal	a === b
Not equal value	a != b
Not equal value or data type	a !== b

3.html, 4.html, 5.html

Comparison

```
if (condition)
   statement
```

if condition in brackets is true execute the statement

```
if(hiddenNumber > enteredNumber)
   console.log("The hidden number is larger")
```

Comparison

```
if (condition)
{
   statement 1
   statement 2
}
```

if condition in brackets is true execute the statements 1 and 2

{} are mandatory for more than one statement

```
if(hiddenNumber > enteredNumber)
{
   console.log("The hidden number is larger")
   console.log("Try again")
}
```

Comparison

Mom: "*Honey, please go to the market and buy 1 bottle of milk. If they have eggs, bring 6*".

I came back with 6 bottles of milk.

Mom: "*Why did you buy 6 bottles of milk?*"

Me: "*Because they had eggs*"

Comparison

```
if(eggs == true)
{
     buy 6 bottles of milk
}
else
{
     buy 1 bottle of milk
}
```

Mom: "*Honey, please go to the market and buy 1 bottle of milk. If they have eggs, bring 6*".

I came back with 6 bottles of milk.

Mom: "*Why did you buy 6 bottles of milk?*"

Me: "*Because they had eggs*"

Comparison

```
if (condition)
{
   statement 1
}
   statement 2
```

logic error

if condition in brackets is true
execute the statement 1

then (even if condition is false)
execute the statement 2

```
if(hiddenNumber > enteredNumber)
{
   console.log("The hidden number is larger")
}
   console.log("Try again")
```

Comparison

```
if(condition)
{
   statement 1
}
else
{
   statement 2
}
```

if condition in brackets is true
execute the statement 1

otherwise
execute the statement 2

{} are optional for one statement

Comparison

```
if(hiddenNumber == enteredNumber)
{
   console.log("Congratulations!")
   console.log("You have found the hidden number!")
}
else
{
   console.log("It is not the hidden number!")
   console.log("Try Again!")
}
```

Logical Operators

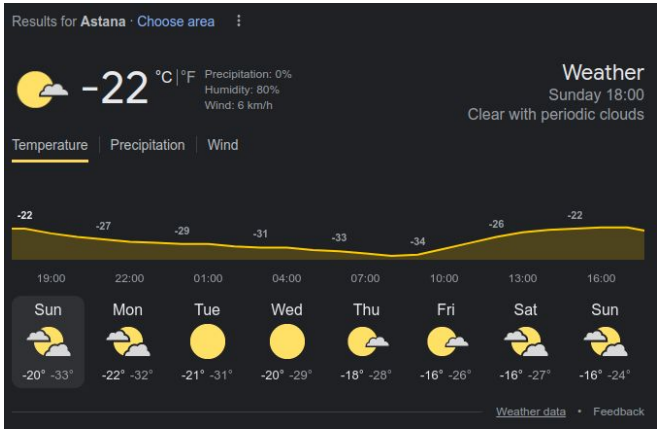
and	(a > 0) && (a <10)
or	(a > 0) || (a <10)
not	! (a == 10)

6.html, 7.html, 8.html

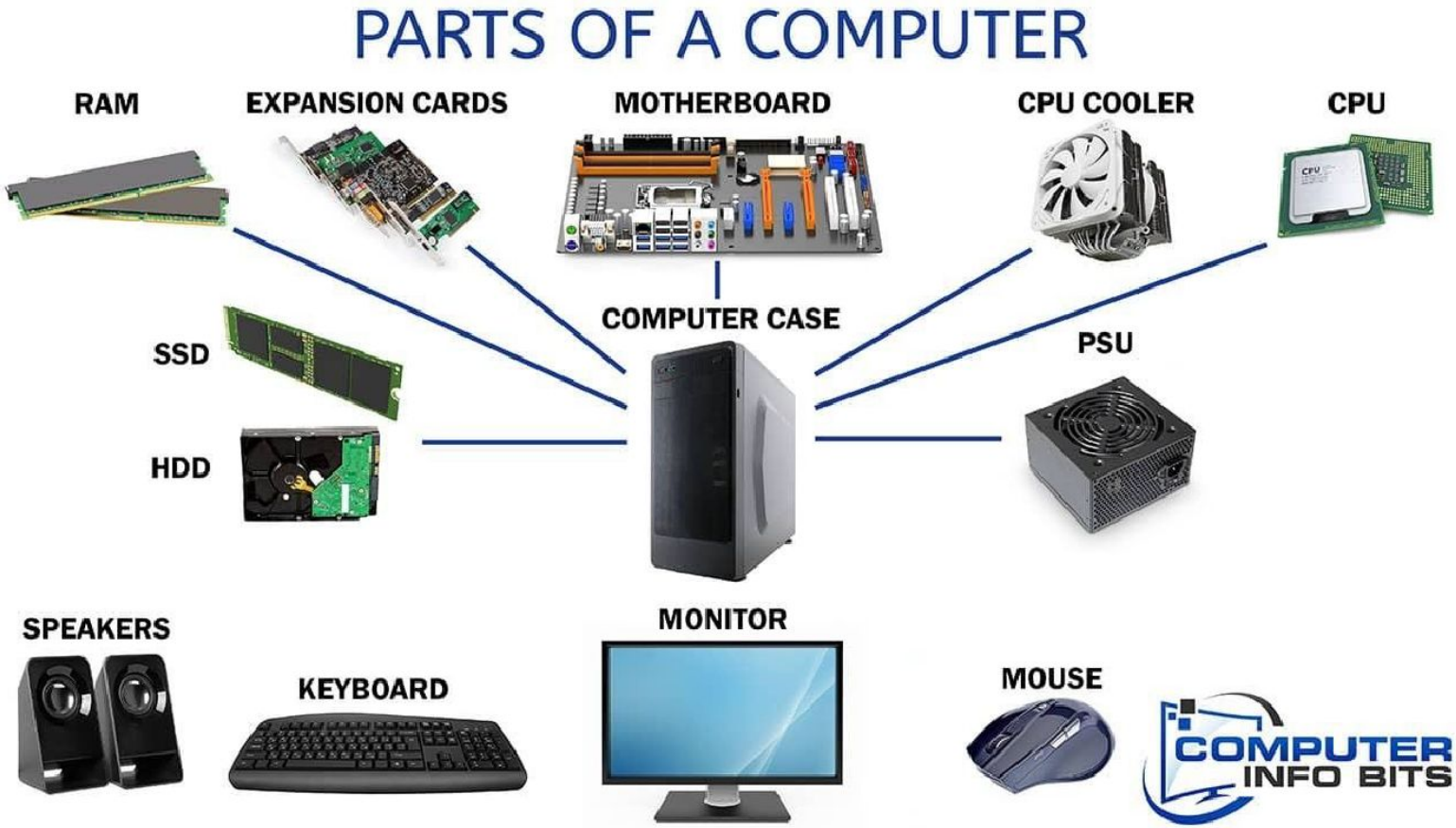
Functions

When we consume service:

- we are not interested in the way it is done;
- we can call it multiple times;



Introduction



Example 1: Parts of a Computer that perform some specific task

Introduction

Example 2: ATM machine

What is JavaScript function?

A **function** is a block of a program code designed to perform a specific task.

The functions are used to provide:

- *Reusability*: to use the same code multiple times in the program
- *Abstraction*: to hide the internals of the code for end user
- *Modularity*: to organize and divide the program into sub tasks

Function usage

The usage of a function is a two phase process:

1 – Function declaration (or definition)

2 – Function invocation (or execution, or call)

Function declaration

```
function multiplyByTwo(a)

{

    return a * 2;

}
```

Function call

```
function multiplyByTwo(a)
{
    return a * 2;
}
let a = 3;
let b = multiplyByTwo(a);
console.log(b);
```

Function declaration

```
const multiplyByThree = function(a)

{

    return a * 3;

}
```

Function call

```
const multiplyByThree = function(a)

{

    return a * 3;

}

let a = 3;

let b = multiplyByThree(a);

console.log(b);
```

Function declaration and call comparison

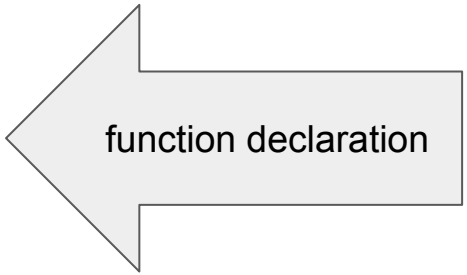
```
function multiplyByTwo(a)
{
    return a * 2;
}
let a = 3;
let b = multiplyByTwo(a);
console.log(b);
```

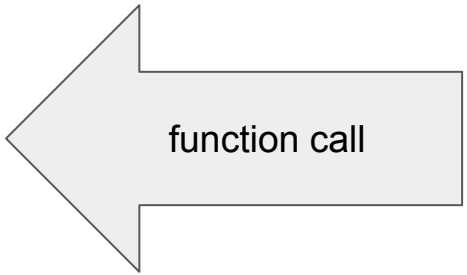
```
const multiplyByThree = function(a)
{
    return a * 3;
}
let a = 3;
let b = multiplyByThree(a);
console.log(b);
```

9.html, 10.html

Function parameters and arguments

```
function functionName(parameter)
{
    //do something
    return something;
}
let a = 3;
let b = functionName(argument);
```





https://www.w3schools.com/js/js_function_parameters.asp

Function arguments

- *The arguments are passed by values and not visible to the outside of the function*
- *If a function changes an object property, it changes the original value*
- *The functions can be passed as the arguments*

11.html, 12.html

Scope

Scope determines the accessibility (visibility) of variables.

JavaScript has 3 types of scope:

- Global scope – visible everywhere
- Block scope – visible within a block “{}”
- Function scope – visible within a function

https://www.w3schools.com/js/js_scope.asp

Scope

Global Scope. A variable declared outside a function, have Global Scope. Global variables can be accessed from anywhere in a JavaScript program.

Block Scope. Let and Const variables declared inside a { } block cannot be accessed from outside the block.

Function Scope. Variables declared within a JavaScript function, can only be accessed from within the function.

*variables assigned without var, let and const automatically have a global scope;

https://www.w3schools.com/js/js_scope.asp

13.html, 15.html

Summary

Key takeaways:

• A function is block of code to perform specific task and used for:

reusability, abstraction and modularity

• Remember 2-step function usage: declare and call

• The arguments are passed by value, though object and array arguments can be changed inside a function

• JavaScript has 3 types of scope: block, function, global

• Visibility of variables differs depending on scope