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Day 2

Data Types

In the previous section, we mentioned a little bit about data types. Data or values have data types. Data types describe the characteristics of data. Data types can be divided into two:

1. Primitive data types
2. Non-primitive data types(Object References)

Primitive Data Types

Primitive data types in JavaScript include:

1. Numbers - Integers, floats
2. Strings - Any data under single quote, double quote or backtick quote
3. Booleans - true or false value
4. Null - empty value or no value
5. Undefined - a declared variable without a value
6. Symbol - A unique value that can be generated by Symbol constructor

Non-primitive data types in JavaScript includes:

1. Objects
2. Arrays

Now, let us see what exactly primitive and non-primitive data types mean. *Primitive* data types are immutable(non-modifiable) data types. Once a primitive data type is created we cannot modify it.

Example:

```
let word = 'JavaScript'
```

If we try to modify the string stored in variable *word*, JavaScript should raise an error. Any data type under a single quote, double quote, or backtick quote is a string data type.

```
word[0] = 'Y'
```

This expression does not change the string stored in the variable *word*. So, we can say that strings are not modifiable or in other words immutable. Primitive data types are compared by its values. Let us compare different data values. See the example below:

```
let numOne = 3
let numTwo = 3

console.log(numOne == numTwo)    // true

let js = 'JavaScript'
let py = 'Python'

console.log(js == py)            //false

let lightOn = true
let lightOff = false

console.log(lightOn == lightOff) // false
```

Non-Primitive Data Types

Non-primitive data types are modifiable or mutable. We can modify the value of non-primitive data types after it gets created. Let us see by creating an array. An array is a list of data values in a square bracket. Arrays can contain the same or different data types. Array values are referenced by their index. In JavaScript array index starts at zero. I.e., the first element of an array is found at index zero, the second element at index one, and the third element at index two, etc.

```
let nums = [1, 2, 3]
nums[0] = 10

console.log(nums) // [10, 2, 3]
```

As you can see, an array, which is a non-primitive data type is mutable. Non-primitive data types cannot be compared by value. Even if two non-primitive data types have the same properties and values, they are not strictly equal.

```
let nums = [1, 2, 3]
let numbers = [1, 2, 3]

console.log(nums == numbers) // false

let userOne = {
  name: 'Debasish',
  role: 'teaching',
  country: 'India'
}

let userTwo = {
  name: 'Debasish',
  role: 'teaching',
  country: 'India'
}

console.log(userOne == userTwo) // false
```

Rule of thumb, we do not compare non-primitive data types. Do not compare arrays, functions, or objects. Non-primitive values are referred to as reference types, because they are being compared by reference instead of value. Two objects are only strictly equal if they refer to the same underlying object.

```
let nums = [1, 2, 3]
let numbers = nums

console.log(nums == numbers) // true

let userOne = {
  name: 'Debasish',
  role: 'teaching',
  country: 'India'
}

let userTwo = userOne

console.log(userOne == userTwo) // true
```

If you have a hard time understanding the difference between primitive data types and non-primitive data types, you are not the only one. Calm down and just go to the next section and try to come back after some time. Now let us start the data types by number type.

Numbers

Numbers are integers and decimal values which can do all the arithmetic operations. Let's see some examples of Numbers.

Declaring Number Data Types

```
let age = 35
const gravity = 9.81 // we use const for non-changing values, gravitational
                    // constant in m/s2
let mass = 72        // mass in Kilogram
const PI = 3.14       // pi a geometrical constant

// More Examples
const boilingPoint = 100 // temperature in oC, boiling point of water which is a
                          // constant
const bodyTemp = 37      // oC average human body temperature, which is a constant

console.log(age, gravity, mass, PI, boilingPoint, bodyTemp)
```

Math Object

In JavaScript the Math Object provides a lots of methods to work with numbers.

```
const PI = Math.PI

console.log(PI) // 3.141592653589793

// Rounding to the closest number
// if above .5 up if less 0.5 down rounding

console.log(Math.round(PI)) // 3 to round values to the nearest
number

console.log(Math.round(9.81)) // 10

console.log(Math.floor(PI)) // 3 rounding down

console.log(Math.ceil(PI)) // 4 rounding up

console.log(Math.min(-5, 3, 20, 4, 5, 10)) // -5, returns the minimum value

console.log(Math.max(-5, 3, 20, 4, 5, 10)) // 20, returns the maximum value

const randNum = Math.random() // creates random number between 0 to 0.999999
```

```

console.log(randNum)

// Let us create random number between 0 to 10

const num = Math.floor(Math.random() * 11) // creates random number between 0 and 10
console.log(num)

//Absolute value
console.log(Math.abs(-10)) // 10

//Square root
console.log(Math.sqrt(100)) // 10

console.log(Math.sqrt(2)) // 1.41421356237Welcome to951

// Power
console.log(Math.pow(3, 2)) // 9

console.log(Math.E) // 2.718

// Logarithm
// Returns the natural logarithm with base E of x, Math.log(x)
console.log(Math.log(2)) // 0.6931471805599453
console.log(Math.log(10)) // 2.Welcome to2585092994046

// Returns the natural logarithm of 2 and 10 respectively
console.log(Math.LN2) // 0.6931471805599453
console.log(Math.LN10) // 2.Welcome to2585092994046

// Trigonometry
Math.sin(0)
Math.sin(60)

Math.cos(0)
Math.cos(60)

```

Random Number Generator

The JavaScript Math Object has a random() method number generator which generates number from 0 to 0.999999999...

```
let randomNum = Math.random() // generates 0 to 0.999...
```

Now, let us see how we can use random() method to generate a random number between 0 and 10:

```
let randomNum = Math.random() // generates 0 to 0.999
let numBtnZeroAndTen = randomNum * 11
```

```
console.log(numBtnZeroAndTen)           // this gives: min 0 and max 10.99

let randomNumRoundToFloor = Math.floor(numBtnZeroAndTen)
console.log(randomNumRoundToFloor)      // this gives between 0 and 10
```

Strings

Strings are texts, which are under **single**, **double**, **back-tick** quote. To declare a string, we need a variable name, assignment operator, a value under a single quote, double quote, or backtick quote. Let's see some examples of strings:

```
let space = ' '           // an empty space string
let firstName = 'Debasish'
let lastName = 'Sahoo'
let country = 'India'
let city = 'Kolkata'
let language = 'JavaScript'
let job = 'teacher'
let quote = "The saying, 'Seeing is Believing' is not correct in 2020."
let quotWithBackTick = `The saying, 'Seeing is Believing' is not correct in 2020.`
```

String Concatenation

Connecting two or more strings together is called concatenation. Using the strings declared in the previous String section:

```
let fullName = firstName + space + lastName; // concatenation, merging two string
together.
console.log(fullName);
```

Debasish Sahoo

We can concatenate strings in different ways.

Concatenating Using Addition Operator

Concatenating using the addition operator is an old way. This way of concatenating is tedious and error-prone. It is good to know how to concatenate this way, but I strongly suggest to use the ES6 template strings (explained later on).

```
// Declaring different variables of different data types
let space = ' '
let firstName = 'Debasish'
```

```
let lastName = 'Sahoo'
let country = 'India'
let city = 'Kolkata'
let language = 'JavaScript'
let job = 'teacher'
let age = 250

let fullName = firstName + space + lastName
let personInfoOne = fullName + '. I am ' + age + '. I live in ' + country; // ES5
string addition

console.log(personInfoOne)
```

Debasish Sahoo. I am 250. I live in India

Long Literal Strings

A string could be a single character or paragraph or a page. If the string length is too big it does not fit in one line. We can use the backslash character (\) at the end of each line to indicate that the string will continue on the next line. **Example:**

```
const paragraph = "My name is Debasish Sahoo. I live in India, Kolkata.\
I am a teacher and I love teaching. I teach HTML, CSS, JavaScript, React, Redux, \
Node.js, Python, Data Analysis and D3.js for anyone who is interested to learn. \
In the end of 2019, I was thinking to expand my teaching and to reach \
to global audience and I started a Python challenge from November 20 - December \
19.\
It was one of the most rewarding and inspiring experience.\
Now, we are in 2020. I am enjoying preparing the World of Javascript challenge and \
I hope you are enjoying too."

console.log(paragraph)
```

Escape Sequences in Strings

In JavaScript and other programming languages \ followed by some characters is an escape sequence. Let's see the most common escape characters:

- \n: new line
- \t: Tab, means 8 spaces
- \\: Back slash
- \': Single quote (')
- \": Double quote (")

```

console.log('I hope everyone is enjoying the World Of JavaScript challenge.\nDo
you ?') // line break
console.log('World\tTopics\tExercises')
console.log('Day 1\t3\t5')
console.log('Day 2\t3\t5')
console.log('Day 3\t3\t5')
console.log('Day 4\t3\t5')
console.log('This is a backslash  symbol (\\)') // To write a backslash
console.log('In every programming language it starts with \"Hello, World!\"')
console.log("In every programming language it starts with 'Hello, World!'")
console.log('The saying \'Seeing is Believing\' isn\'t correct in 2020')

```

Output in console:

```

I hope everyone is enjoying the World Of JavaScript challenge.
Do you ?
World  Topics  Exercises
Day 1 3 5
Day 2 3 5
Day 3 3 5
Day 4 3 5
This is a backslash  symbol (\\)
In every programming language it starts with "Hello, World!"
In every programming language it starts with 'Hello, World!'
The saying 'Seeing is Believing' isn't correct in 2020

```

Template Literals (Template Strings)

To create a template strings, we use two back-ticks. We can inject data as expressions inside a template string. To inject data, we enclose the expression with a curly bracket({}) preceded by a \$ sign. See the syntax below.

```

//Syntax
`String literal text`
`String literal text ${expression}`

```

Example: 1

```

console.log(`The sum of 2 and 3 is 5`) // statically writing the data
let a = 2
let b = 3
console.log(`The sum of ${a} and ${b} is ${a + b}`) // injecting the data
dynamically

```

Example:2


```
let firstName = 'Debasish'
let lastName = 'Sahoo'
let country = 'India'
let city = 'Kolkata'
let language = 'JavaScript'
let job = 'teacher'
let age = 250
let fullName = firstName + ' ' + lastName

let personInfoTwo = `I am ${fullName}. I am ${age}. I live in ${country}.` //ES6 -
String interpolation method
let personInfoThree = `I am ${fullName}. I live in ${city}, ${country}. I am a
${job}. I teach ${language}.`
console.log(personInfoTwo)
console.log(personInfoThree)
```

```
I am Debasish Sahoo. I am 250. I live in India.
I am Debasish Sahoo. I live in Kolkata, India. I am a teacher. I teach JavaScript.
```

Using a string template or string interpolation method, we can add expressions, which could be a value, or some operations (comparison, arithmetic operations, ternary operation).

```
let a = 2
let b = 3
console.log(`${a} is greater than ${b}: ${a > b}`)
```

```
2 is greater than 3: false
```

String Methods

Everything in JavaScript is an object. A string is a primitive data type that means we can not modify it once it is created. The string object has many string methods. There are different string methods that can help us to work with strings.

1. *length*: The string *length* method returns the number of characters in a string included empty space.

Example:

```
let js = 'JavaScript'
console.log(js.length) // 10
let firstName = 'Debasish'
console.log(firstName.length) // 8
```

2. *Accessing characters in a string*: We can access each character in a string using its index. In programming, counting starts from 0. The first index of the string is zero, and the last index is the length of the string minus one.

`let string = 'JavaScript'`

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

JavaScript

Let us access different characters in 'JavaScript' string.

```
let string = 'JavaScript'
let firstLetter = string[0]

console.log(firstLetter)           // J

let secondLetter = string[1]       // a
let thirdLetter = string[2]
let lastLetter = string[9]

console.log(lastLetter)            // t

let lastIndex = string.length - 1

console.log(lastIndex)             // 9
console.log(string[lastIndex])     // t
```

3. *toUpperCase()*: this method changes the string to uppercase letters.

```
let string = 'JavaScript'

console.log(string.toUpperCase())   // JAVASCRIPT

let firstName = 'Debasish'

console.log(firstName.toUpperCase()) // Debasish

let country = 'India'

console.log(country.toUpperCase())  // India
```

4. *toLowerCase()*: this method changes the string to lowercase letters.

```
let string = 'JavaScript'

console.log(string.toLowerCase())    // javascript

let firstName = 'Debasish'

console.log(firstName.toLowerCase()) // Debasish

let country = 'India'

console.log(country.toLowerCase())   // India
```

5. *substr()*: It takes two arguments, the starting index and number of characters to slice.

```
let string = 'JavaScript'
console.log(string.substr(4,6))    // Script

let country = 'India'
console.log(country.substr(3, 4))  // land
```

6. *substring()*: It takes two arguments, the starting index and the stopping index but it doesn't include the character at the stopping index.

```
let string = 'JavaScript'

console.log(string.substring(0,4))    // Java
console.log(string.substring(4,10))   // Script
console.log(string.substring(4))      // Script

let country = 'India'

console.log(country.substring(0, 3))   // In
console.log(country.substring(3, 7))   // land
console.log(country.substring(3))      // land
```

7. *split()*: The split method splits a string at a specified place.

```
let string = 'World Of JavaScript'

console.log(string.split())           // Changes to an array -> ["World Of JavaScript"]
console.log(string.split(' '))        // Split to an array at space -> ["World", "Of", "JavaScript"]

let firstName = 'Debasish'

console.log(firstName.split())         // Change to an array - > ["Debasish"]
```

```

console.log(firstName.split('')) // Split to an array at each letter -> ["A",
"s", "a", "b", "e", "n", "e", "h"]

let countries = 'India, Sweden, Norway, Denmark, and Iceland'

console.log(countries.split(',')) // split to any array at comma -> ["India", "
Sweden", " Norway", " Denmark", " and Iceland"]
console.log(countries.split(', ')) // ["India", "Sweden", "Norway", "Denmark",
"and Iceland"]

```

8. *trim()*: Removes trailing space in the beginning or the end of a string.

```

let string = '   World Of JavaScript   '

console.log(string)
console.log(string.trim(' '))

let firstName = ' Debasish '

console.log(firstName)
console.log(firstName.trim()) // still removes spaces at the beginning and the
end of the string

```

```

   World Of JavaScript
World Of JavaScript
  Debasish
Debasish

```

9. *includes()*: It takes a substring argument and it checks if substring argument exists in the string.
includes() returns a boolean. If a substring exist in a string, it returns true, otherwise it returns false.

```

let string = 'World Of JavaScript'

console.log(string.includes('World')) // true
console.log(string.includes('World')) // false - it is case sensitive!
console.log(string.includes('Script')) // true
console.log(string.includes('script')) // false
console.log(string.includes('java')) // false
console.log(string.includes('Java')) // true

let country = 'India'

console.log(country.includes('In')) // false
console.log(country.includes('In')) // true
console.log(country.includes('land')) // true
console.log(country.includes('Land')) // false

```

10. `replace()`: takes as a parameter the old substring and a new substring.

```
string.replace(oldsubstring, newsubstring)
```

```
let string = 'World Of JavaScript'
console.log(string.replace('JavaScript', 'Python')) // Welcome to World Of Python

let country = 'India'
console.log(country.replace('In', 'Deb'))           // InDeb
```

11. `charAt()`: Takes index and it returns the value at that index

```
string.charAt(index)
```

```
let string = 'World Of JavaScript'
console.log(string.charAt(0))           // 3

let lastIndex = string.length - 1
console.log(string.charAt(lastIndex)) // t
```

12. `charCodeAt()`: Takes index and it returns char code (ASCII number) of the value at that index

```
string.charCodeAt(index)
```

```
let string = 'World Of JavaScript'
console.log(string.charCodeAt(3))       // D ASCII number is 68

let lastIndex = string.length - 1
console.log(string.charCodeAt(lastIndex)) // t ASCII is 116
```

13. `indexOf()`: Takes a substring and if the substring exists in a string it returns the first position of the substring if does not exist it returns -1

```
string.indexOf(substring)
```

```
let string = 'World Of JavaScript'

console.log(string.indexOf('D'))           // 3
console.log(string.indexOf('World'))       // 3
console.log(string.indexOf('World'))       // -1
console.log(string.indexOf('a'))           // 4
console.log(string.indexOf('JavaScript'))  // 11
console.log(string.indexOf('Script'))      // 15
console.log(string.indexOf('script'))      // -1
```

14. *lastIndexOf()*: Takes a substring and if the substring exists in a string it returns the last position of the substring if it does not exist it returns -1

```
//syntax
string.lastIndexOf(substring)
```

```
let string = 'I love JavaScript. If you do not love JavaScript what else can you love.'

console.log(string.lastIndexOf('love'))    // 67
console.log(string.lastIndexOf('you'))     // 63
console.log(string.lastIndexOf('JavaScript')) // 38
```

15. *concat()*: it takes many substrings and joins them.

```
string.concat(substring, substring, substring)
```

```
let string = 'Welcome to'
console.log(string.concat("World", "Of", "JavaScript")) // World of Javascript

let country = 'In'
console.log(country.concat("land")) // India
```

16. *startsWith()*: it takes a substring as an argument and it checks if the string starts with that specified substring. It returns a boolean(true or false).

```
//syntax
string.startsWith(substring)
```

```
let string = 'Love is the best to in this world'

console.log(string.startsWith('Love')) // true
console.log(string.startsWith('love')) // false
console.log(string.startsWith('world')) // false

let country = 'India'

console.log(country.startsWith('In')) // true
console.log(country.startsWith('In')) // false
console.log(country.startsWith('land')) // false
```

17. *endsWith*: it takes a substring as an argument and it checks if the string ends with that specified substring. It returns a boolean(true or false).

```
string.endsWith(substring)
```

```
let string = 'Love is the most powerful feeling in the world'

console.log(string.endsWith('world')) // true
console.log(string.endsWith('love')) // false
console.log(string.endsWith('in the world')) // true

let country = 'India'

console.log(country.endsWith('land')) // true
console.log(country.endsWith('In')) // false
console.log(country.endsWith('In')) // false
```

18. *search*: it takes a substring as an argument and it returns the index of the first match. The search value can be a string or a regular expression pattern.

```
string.search(substring)
```

```
let string = 'I love JavaScript. If you do not love JavaScript what else can you love.'
console.log(string.search('love')) // 2
console.log(string.search(/javascript/gi)) // 7
```

19. *match*: it takes a substring or regular expression pattern as an argument and it returns an array if there is match if not it returns null. Let us see how a regular expression pattern looks like. It starts with / sign and ends with / sign.

```
let string = 'love'  
let patternOne = /love/    // with out any flag  
let patternTwo = /love/gi  // g-means to search in the whole text, i - case  
insensitive
```

Match syntax

```
// syntax  
string.match(substring)
```

```
let string = 'I love JavaScript. If you do not love JavaScript what else can you  
love.'  
console.log(string.match('love'))
```

```
["love", index: 2, input: "I love JavaScript. If you do not love JavaScript what  
else can you love.", groups: undeIned]
```

```
let pattern = /love/gi  
console.log(string.match(pattern))    // ["love", "love", "love"]
```

Let us extract numbers from text using a regular expression. This is not the regular expression section, do not panic! We will cover regular expressions later on.

```
let txt = 'In 2019, I ran Welcome to World of Python. Now, in 2020 I am super  
exited to start this challenge'  
let regEx = /\d+/  
  
// d with escape character means d not a normal d instead acts a digit  
// + means one or more digit numbers,  
// if there is g after that it means global, search everywhere.  
  
console.log(txt.match(regEx))    // ["2", "0", "1", "9", "3", "0", "2", "0", "2",  
"0"]  
console.log(txt.match(/\d+/g)) // ["2019", "Welcome to", "2020"]
```

20. *repeat()*: it takes a number as argument and it returns the repeated version of the string.

```
string.repeat(n)
```



```
let string = 'love'  
console.log(string.repeat(10)) // lovelovelovelovelovelovelovelovelove
```

Checking Data Types and Casting

Checking Data Types

To check the data type of a certain variable we use the *typeof* method.

Example:

```
// Different javascript data types  
// Let's declare different data types  
  
let firstName = 'Debasish'    // string  
let lastName = 'Sahoo'       // string  
let country = 'India'        // string  
let city = 'Kolkata'         // string  
let age = 250                 // number, it is not my real age, do not worry  
about it  
let job                       // undeIned, because a value was not assigned  
  
console.log(typeof 'Debasish') // string  
console.log(typeof firstName)  // string  
console.log(typeof 10)         // number  
console.log(typeof 3.14)       // number  
console.log(typeof true)       // boolean  
console.log(typeof false)      // boolean  
console.log(typeof NaN)        // number  
console.log(typeof job)        // undeIned  
console.log(typeof undeIned)   // undeIned  
console.log(typeof null)      // object
```

Changing Data Type (Casting)

- Casting: Converting one data type to another data type. We use *parseInt()*, *parseFloat()*, *Number()*, *+* *sign*, *str()* When we do arithmetic operations string numbers should be first converted to integer or float if not it returns an error.

String to Int

We can convert string number to a number. Any number inside a quote is a string number. An example of a string number: '10', '5', etc. We can convert string to number using the following methods:

- *parseInt()*
- *Number()*
- Plus sign(+)

```
let num = '10'  
let numInt = parseInt(num)  
console.log(numInt) // 10
```

```
let num = '10'  
let numInt = Number(num)  
  
console.log(numInt) // 10
```

```
let num = '10'  
let numInt = +num  
  
console.log(numInt) // 10
```

String to Float

We can convert string float number to a float number. Any float number inside a quote is a string float number. An example of a string float number: '9.81', '3.14', '1.44', etc. We can convert string float to number using the following methods:

- parseFloat()
- Number()
- Plus sign(+)

```
let num = '9.81'  
let numFloat = parseFloat(num)  
  
console.log(numFloat) // 9.81
```

```
let num = '9.81'  
let numFloat = Number(num)  
  
console.log(numFloat) // 9.81
```

```
let num = '9.81'  
let numFloat = +num  
  
console.log(numFloat) // 9.81
```

Float to Int

We can convert float numbers to integers. We use the following method to convert float to int:

- `parseInt()`

```
let num = 9.81
let numInt = parseInt(num)

console.log(numInt) // 9
```

👏 You are awesome. You have just completed day 2 challenges and you are two steps ahead on your way to greatness. Now do some exercises for your brain and for your muscle.



Day 2: Exercises

Exercise: Level 1

1. Declare a variable named `challenge` and assign it to an initial value **'World Of JavaScript'**.
2. Print the string on the browser console using **`console.log()`**
3. Print the **length** of the string on the browser console using **`console.log()`**
4. Change all the string characters to capital letters using **`toUpperCase()`** method
5. Change all the string characters to lowercase letters using **`toLowerCase()`** method
6. Cut (slice) out the first word of the string using **`substr()`** or **`substring()`** method
7. Slice out the phrase *World Of JavaScript* from *World Of JavaScript*.
8. Check if the string contains a word **Script** using **`includes()`** method
9. Split the **string** into an **array** using **`split()`** method
10. Split the string *World Of JavaScript* at the space using **`split()`** method
11. 'Facebook, Google, Microsoft, Apple, IBM, Oracle, Amazon' **split** the string at the comma and change it to an array.
12. Change *World Of JavaScript* to *Welcome to World Of Python* using **`replace()`** method.
13. What is character at index 15 in 'World Of JavaScript' string? Use **`charAt()`** method.
14. What is the character code of J in 'World Of JavaScript' string using **`charCodeAt()`**
15. Use **`indexOf`** to determine the position of the first occurrence of **a** in *World Of JavaScript*
16. Use **`lastIndexOf`** to determine the position of the last occurrence of **a** in *World Of JavaScript*.
17. Use **`indexOf`** to find the position of the first occurrence of the word **because** in the following sentence: **'You cannot end a sentence with because because because is a conjunction'**
18. Use **`lastIndexOf`** to find the position of the last occurrence of the word **because** in the following sentence: **'You cannot end a sentence with because because because is a conjunction'**
19. Use **`search`** to find the position of the first occurrence of the word **because** in the following sentence: **'You cannot end a sentence with because because because is a conjunction'**
20. Use **`trim()`** to remove any trailing whitespace at the beginning and the end of a string. E.g ' World Of JavaScript '.
21. Use **`startsWith()`** method with the string *World Of JavaScript* and make the result true
22. Use **`endsWith()`** method with the string *World Of JavaScript* and make the result true
23. Use **`match()`** method to find all the **a's** in *World Of JavaScript*
24. Use **`concat()`** and merge 'Welcome to World of' and 'JavaScript' to a single string, 'World Of JavaScript'

25. Use **repeat()** method to print World Of JavaScript 2 times

Exercise: Level 2

1. Using console.log() print out the following statement:

```
The quote 'There is no exercise better for the heart than reaching down and lifting people up.' by John Holmes teaches us to help one another.
```

2. Using console.log() print out the following quote by Mother Teresa:

```
"Love is not patronizing and charity isn't about pity, it is about love. Charity and love are the same -- with charity you give love, so don't just give money but reach out your hand instead."
```

3. Check if typeof '10' is exactly equal to 10. If not make it exactly equal.
4. Check if parseFloat('9.8') is equal to 10 if not make it exactly equal with 10.
5. Check if 'on' is found in both python and jargon
6. *I hope this course is not full of jargon.* Check if *jargon* is in the sentence.
7. Generate a random number between 0 and 100 inclusively.
8. Generate a random number between 50 and 100 inclusively.
9. Generate a random number between 0 and 255 inclusively.
10. Access the 'JavaScript' string characters using a random number.
11. Use console.log() and escape characters to print the following pattern.

```
1 1 1 1 1
2 1 2 4 8
3 1 3 9 27
4 1 4 16 64
5 1 5 25 125
```

12. Use **substr** to slice out the phrase **because because because** from the following sentence: **'You cannot end a sentence with because because because is a conjunction'**

Exercises: Level 3

1. 'Love is the best thing in this world. Some found their love and some are still looking for their love.'
Count the number of word **love** in this sentence.

2. Use **match()** to count the number of all **because** in the following sentence: **'You cannot end a sentence with because because because is a conjunction'**
3. Clean the following text and find the most frequent word (hint, use replace and regular expressions).

```
const sentence = '%I $am@% a %tea@cher%, &and& I lo%#ve %te@a@ching%;.  
The@re $is no@th@ing; &as& mo@re rewarding as educa@ting &and&  
@emp%o@weri@ng peo@ple. ;I found tea@ching m%o@re interesting tha@n any  
ot#her %jo@bs. %Do@es thi@s mo@tiv#ate yo@u to be a tea@cher!? %Th#is  
Welcome to#World&OfJavaScript &is al@so $the $resu@lt of &love& of  
tea&ching'
```

4. Calculate the total annual income of the person by extracting the numbers from the following text. 'He earns 5000 euro from salary per month, 10000 euro annual bonus, 15000 euro online courses per month.'