Regular Expressions

This lesson is a brief introduction to Regular Expressions and their importance in JavaScript.

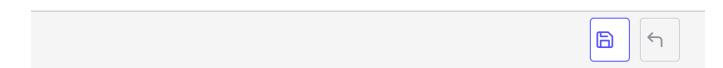
The previous validations were quite primitive: many strings containing a @ character are not valid email addresses. To perform more advanced checks, you can use a powerful tool: regular expressions.

A regular expression defines a *pattern* to which strings are compared, searching for matches. Many programming languages support them. A powerful addition to a programmer's toolbelt, they can nonetheless take quite a bit of time to be comfortable with. What follows is just an introduction to the vast domain of regular expression.

Let's get started by trying to create a regular expression checking for the presence of an @ character inside a string. Here's the associated JavaScript code.

```
JavaScript

const regex = /@/; // String must contain @
console.log(regex.test("")); // false
console.log(regex.test("@")); // true
console.log(regex.test("sophie&mail.fr")); // false
console.log(regex.test("sophie@mail.fr")); // true
```



A JavaScript regular expression is defined by placing its pattern between a pair of / characters. It's an object whose test() method checks matches between the pattern and the string passed as a parameter. If a match is detected, this method returns true, and false otherwise.

The following table presents some of the numerous possibilities offered by regular expressions.

Pattern	Matches if	Match	No Match
abc	String contains "abc"	"abc", "abcdef", "123abc456"	"abdc", "1bca", "adbc", "ABC"
[abc]	String contains either "a", "b" or "c"	"abc", "daef", "bbb", "12c34"	"def", "xyz", "1 23456", "BBB"
[a-z]	String contains a lowercase letter	"abc", "12f43", "_r_"	"123", "ABC", "_ "
[0-9] or \d	String contains a digit	"123", "ab4c", " a56"	"abc"
a.c	String contains "a", followed by any character, followed by "c"	"abc", "acc", "1 2a.c34"	"ac", "abbc", "A BC"
a\.c	String contains "a.c"	"a.c", "a.cdef", "12a.c34"	"ac", "abc"
a.+c	String contains "a", followed by at least one character, followed by "c"	"abc", "abbc", " 12a\$ùc34"	"ac","bbc"
a.*c	String contains "a", followed by zero or more characters,	"abc", "abbc", " ac"	"ABC", "bbc"

followed by "c"

Observing these examples leads us to the following rules:

- Brackets [] define a character interval. Any string with at least a character in this interval will match the pattern.
- The [a-z] and [A-Z] patterns are used to search for the presence of any letter, respectively lowercase and uppercase.
- The [0-9] and \d patterns are essentially identical and match a digit in a string.
- The . character replaces any one character.
- The \ (backslash) character indicates that the following character should be searched as-if. . For example, \.\ is used to match the . character itself.
- The + character matches one or several instances of the preceding expression.
- The * character matches zero, one, or several instances of the preceding expression.

T> The site https://regex101.com is useful to understand, test and debug regular expressions.

Let's get back to our example and check the email address field. Here's a possible regular expression (among many others) to test it against:

```
/.+@.+\..+/
```

Q> Before reading further, can you decode this pattern to understand what conditions a string must respect to match it?

OK, here is the answer. This pattern matches a string that:

- Starts with one or several characters (.+)
- Next, contains the @ character (@)
- Next, contains one or several characters (.+)
- Next, contains the . character (\.)
- Finishes with one or several characters (.+)

In other words, any string of the form xxx@yyy.zzz will match this pattern. This is not the end-all, be-all way to validate an email address, but it's a start.

Check out how to put this solution into practice.

```
JavaScript

HTML

// Check email validity when field loses focus
document.getElementById("emailAddress").addEventListener("blur", e => {
    // Match a string of the form xxx@yyy.zzz
    const emailRegex = /.+@.+\..+/;
    let validityMessage = "";
    if (!emailRegex.test(e.target.value)) {
       validityMessage = "Invalid address";
    }
    document.getElementById("emailHelp").textContent = validityMessage;
});
```