

## Understanding JavaScript

**Objectives :** At the end of this lesson you shall be able to

- define programming and scripting languages
- know what is JavaScript and history of Java Script
- explain how to run JavaScript
- list out tools you need to run JavaScript
- view sample JavaScript Program
- know features of JavaScript
- describe advantages and disadvantages of JavaScript
- explain JavaScript Versions.

### Introduction to programming and scripting languages

Computer **programming** is the process of writing instructions that get executed by computers. The instructions, also known as code, are written in a **programming** language which the computer can understand and use to perform a task or solve a problem.

A **script** or **scripting language** is a computer language with a series of commands within a file that is capable of being executed without being compiled. Good examples of server-side scripting languages include Perl, PHP, and Python. The best example of a client side scripting language is JavaScript.

### Advantages of scripts

- Open source, allowing users to view and edit the **script** if needed.
- Does not require the file to be compiled, but may be when necessary.
- Easy to learn and write.
- Easy to port between different operating systems.
- Much faster to develop than an actual program - some individuals and companies write scripts as a prototype for actual programs.

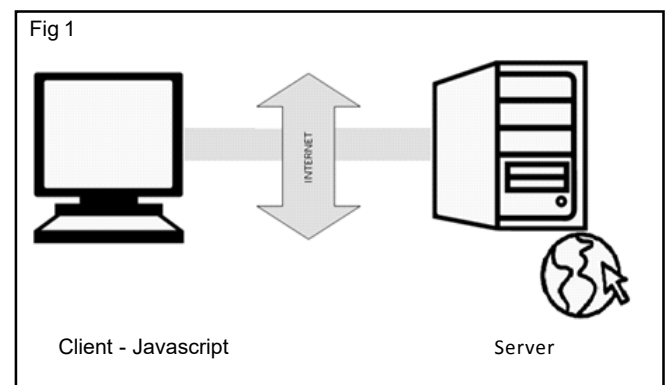
### Disadvantages of scripts

- Open source, allows others to view source code, which may be prohibited by some companies.
- Requires the user to install an interpreter or separate program before the script can be run.
- In some situations, they may be slower than a compiled program.

### What is Java Script?

JavaScript is a very powerful **client-side scripting language**. JavaScript is used mainly for enhancing the interaction of a user with the webpage (Fig 1). In other

words, you can make your webpage more lively and interactive, with the help of JavaScript. JavaScript is also being used widely in game development and Mobile application development.



### JavaScript History

JavaScript was developed by Brendan Eich in 1995, which appeared in Netscape, a popular browser of that time. The language was initially called Live Script and was later renamed JavaScript. There are many programmers who think that JavaScript and Java are the same. In fact, **JavaScript and Java are very much unrelated. Java is a very complex programming language whereas JavaScript is only a scripting language.** The syntax of Java Script is mostly influenced by the programming language C.

### How to Run JavaScript?

Being a scripting language, **JavaScript cannot run on its own. In fact, the browser is responsible for running JavaScript code.** When a user requests an HTML page with JavaScript in it, the script is sent to the browser and it is up to the browser to execute it. The main advantage of JavaScript is that **all modern web browsers support JavaScript.** So, you do not have to worry about whether your site visitor uses Internet Explorer, Google Chrome, Firefox or any other browser. JavaScript will be supported. Also, JavaScript **runs on any operating system** including Windows, Linux or Mac.

## Tools You Need to run JavaScript

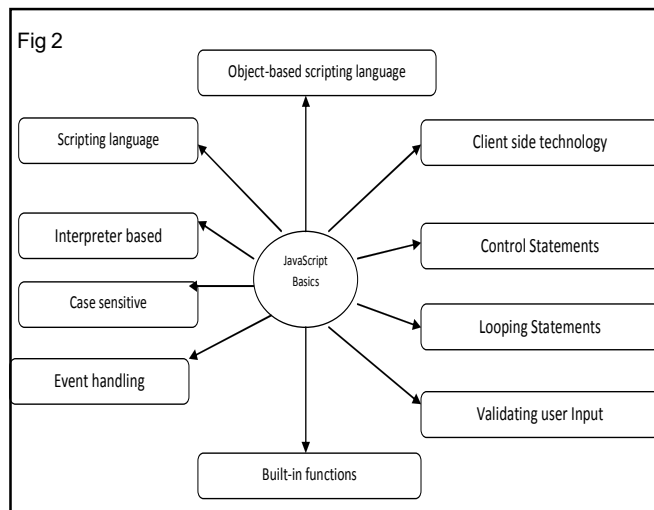
To start with, a text editor to write the code and a browser to display the web pages. A text editor uses of choice including Notepad++, Visual Studio Code, Sublime Text, Atom or any other text editor is comfortable with. And also, can use any web browser including Google Chrome, Firefox, Microsoft Edge, Internet Explorer etc.

## Sample JavaScript program

```
<html>
<head>
<title>My First JavaScript code!!!</title>
<script type="text/javascript">
alert("Welcome to JavaScript Program!");
</script>
</head>
<body>
</body>
</html>
```

## Features of JavaScript

JavaScript is a client side technology, it is mainly used for client side validation, but it has lot of features which are shown in Fig 2.



- JavaScript is a object-based scripting language.
- It gives the user more control over the browser.
- It Handles dates and time.
- It detects the user's browser and OS,
- It is light weighted.
- It is a scripting language and it is not java.
- It is interpreter based scripting language.
- It is case sensitive.

- It is object based language as it provides predefined objects.
- Every statement in JavaScript must be terminated with semicolon (;).
- Most of the JavaScript control statements syntax is same as syntax of control statements in C language.
- An important part of JavaScript is the ability to create new functions within scripts.

## Advantages of JavaScript

- Executed on the client side: For example, user can validate any user input before sending a request to the server. This makes less load on the server.
- Relatively an easy language: This is quite easy to learn and the syntax that is close to English.
- Instance response to the visitors: Without any server interaction, don't have to wait for a page reload to get the desire result.
- Fast to the end user: As the script is executed on the user's computer, depending on task, the results are completed almost instantly.
- Interactivity increased: Creating interfaces that can react when the user hovers over them or activates them using the keyboard.
- Rich interfaces: Drag and drop components or slider may give a rich interface to site visitors.

## Disadvantages of JavaScript

- Security issues: Any JavaScript snippets, while appended onto web pages on client side immediately can also be used for exploiting the user's system.
- Doesn't have any multiprocessor or multi threading capabilities.
- As no supports are available, JavaScript cannot be used for any networking applications.
- JavaScript does not allow us to read or write files.
- JavaScript render varies: JavaScript may be rendered by different layout engines differently. As a result, this causes inconsistency in terms of interface and functionality.

## JavaScript Versions

JavaScript was invented by Brendan Eich in 1995, and became an ECMA standard in 1997. ECMA Script is the official name of the language.

From 2015 ECMA Script is named by year (ECMA Script 2015).

## ECMA Script Editions

Ver	Official Name	Description
1	ECMA Script 1 (1997)	First Edition.
2	ECMA Script 2 (1998)	Editorial changes only.
3	ECMA Script 3 (1999)	Added Regular Expressions. Added try/catch.
4	ECMA Script 4	Never released.
5	ECMA Script 5 (2009)	Added "strict mode". Added JSON support. Added String.trim(). Added Array.isArray(). Added Array Iteration Methods.
5.1	ECMA Script 5.1 (2011)	Editorial changes.
6	ECMA Script 2015	Added let and const. Added default parameter values. Added Array.find(). Added Array.findIndex().
7	ECMA Script 2016	Added exponential operator (**). Added Array.prototype.includes.
8	ECMA Script 2017	Added string padding. Added new Object properties. Added Async functions. Added Shared Memory.
9	ECMA Script 2018	Added rest/spread properties. Added Asynchronous iteration. Added Promise.finally(). Additions to Reg Exp.