Introducing JSON

How JavaScript Works by Douglas Crockford

العربية Български 中文 Český Dansk Nederlands English Esperanto Français Deutsch Ελληνικά עברית Magyar Indonesia Italiano 日本 한국어 فارسی Polski Português Română Русский Српско-хрватски Slovenščina Español Svenska Türkçe Tiếng Việt

ECMA-404 The JSON Data Interchange Standard.

JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate. It is based on a subset of the JavaScript Programming Language Standard ECMA-262 3rd Edition - December 1999. JSON is a text format that is completely language independent but uses conventions that are familiar to programmers of the C-family of languages, including C, C++, C#, Java, JavaScript, Perl, Python, and many others. These properties make JSON an ideal data-interchange language.

JSON is built on two structures:

> A collection of name/value pairs. In various languages, this is realized as an *object*, record, struct, dictionary, hash table, keyed list, or associative array.
> An ordered list of values. In most languages, this is realized as an *array*, vector, list, or sequence.

These are universal data structures. Virtually all modern programming languages support them in one form or another. It makes sense that a data format that is interchangeable with programming languages also be based on these structures.

In JSON, they take on these forms:

An *object* is an unordered set of name/value pairs. An object begins with { *left brace* and ends with } *right brace*. Each name is followed by : *colon* and the name/value pairs are separated by , *comma*.

json
- element

value
- object
- array
- string
- number
- "true"
- "false"
- "null"

object
- '{' ws '}'
- '{' members '}'

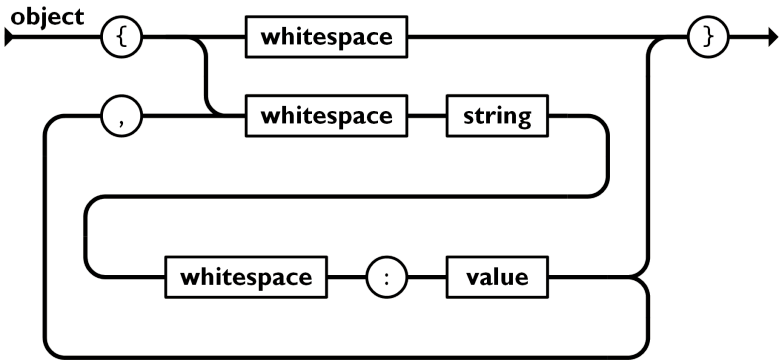
members
- member
- member ',' members

member
- ws string ws ':' element

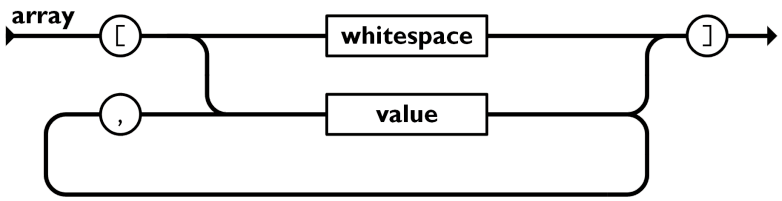
array
- '[' ws ']'
- '[' elements ']'

elements
- element
- element ',' elements

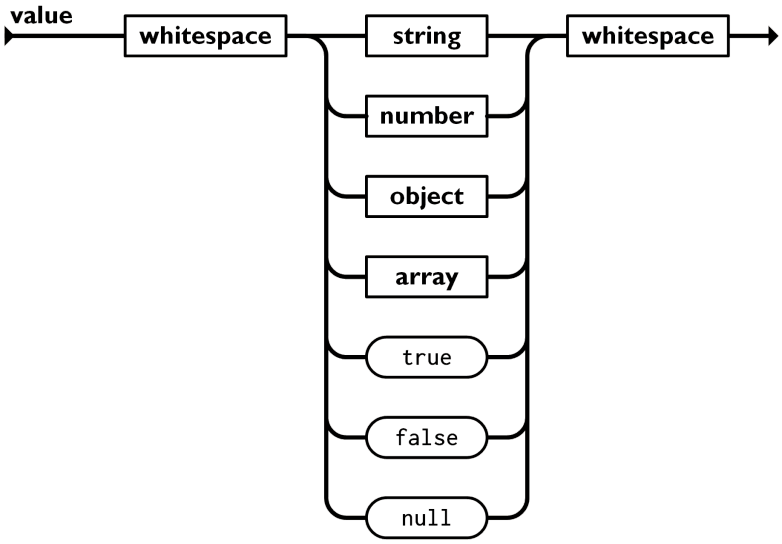
element
- ws value ws



An *array* is an ordered collection of values. An array begins with `[` *left bracket* and ends with `]` *right bracket*. Values are separated by `,` *comma*.



A *value* can be a *string* in double quotes, or a *number*, or `true` or `false` or `null`, or an *object* or an *array*. These structures can be nested.



A *string* is a sequence of zero or more Unicode characters, wrapped in double quotes, using backslash escapes. A character is represented as a single character string. A string is very much like a C or Java string.

string
'"' characters '"'

characters
""
character characters

character
'0020' . '10FFFF' - '"' - '\'
'\' escape

escape
'"'
'\'
'/'
'b'
'f'
'n'
'r'
't'
'u' hex hex hex hex

hex
digit
'A' . 'F'
'a' . 'f'

number
integer fraction exponent

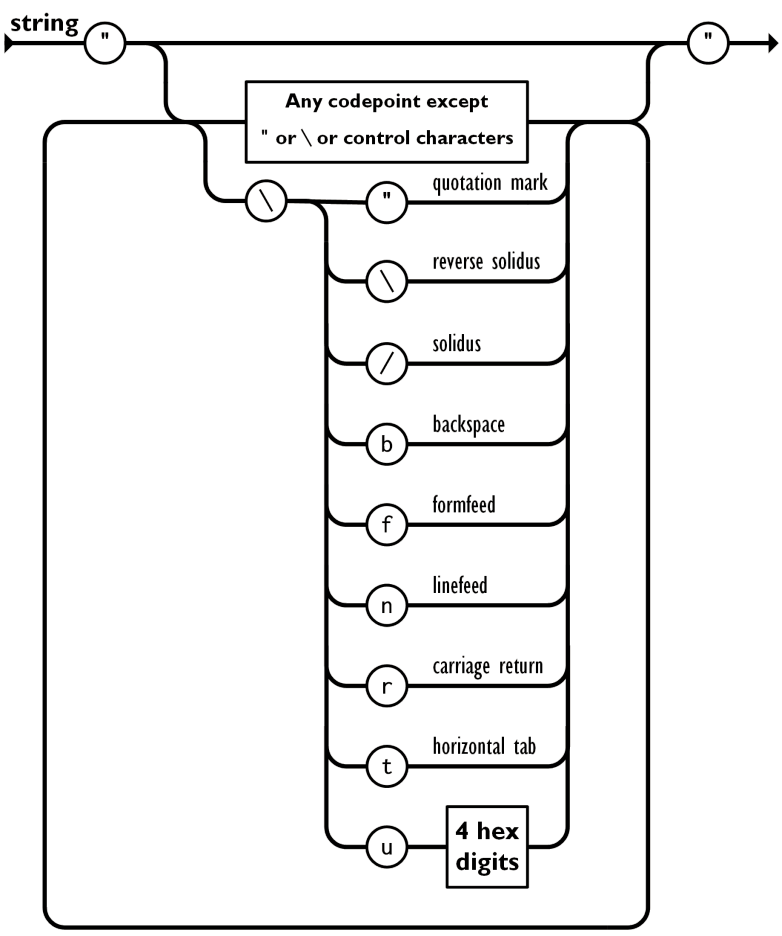
integer
digit
onenine digits
'-' digit
'-' onenine digits

digits
digit
digit digits

digit
'0'
onenine

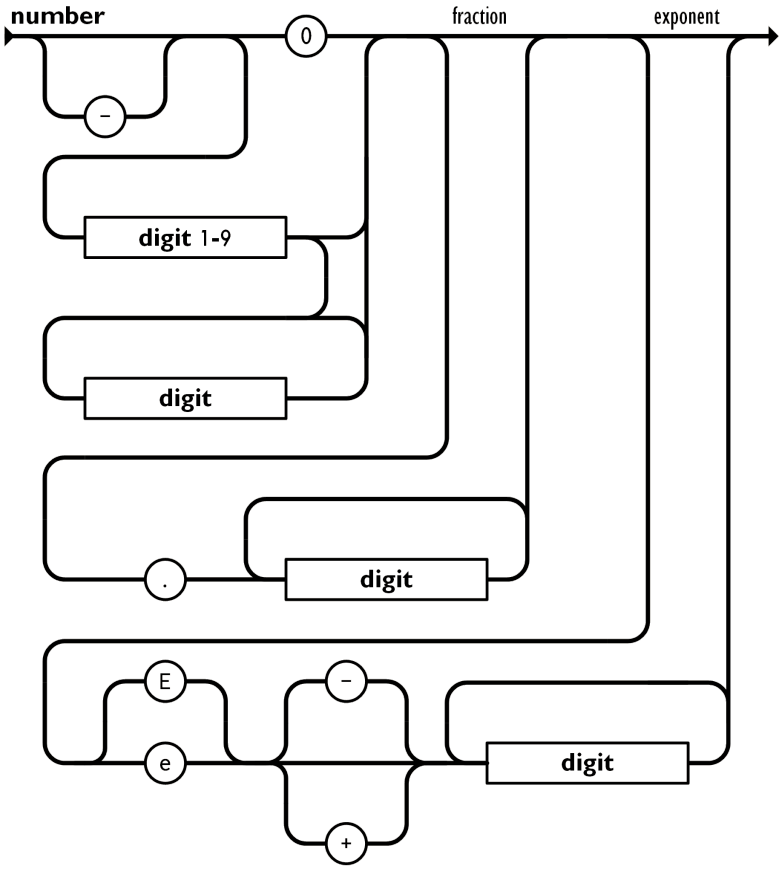
onenine
'1' . '9'

fraction
""
'.' digits

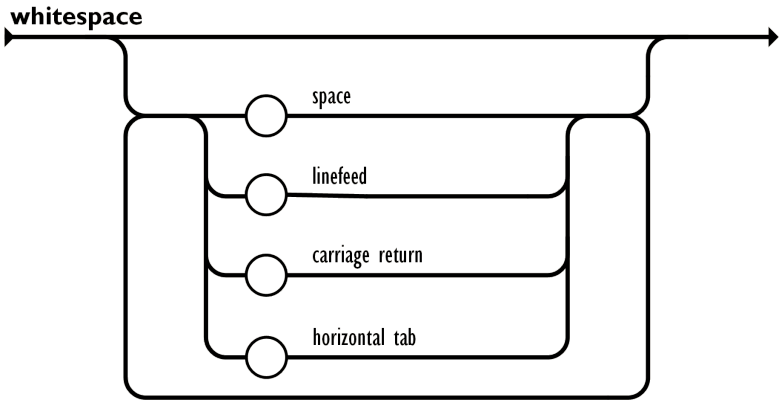



```
exponent
    ""
    'E' sign digits
    'e' sign digits

sign
    ""
    '+'
    '-'

ws
    ""
    '0020' ws
    '000A' ws
    '000D' ws
    '0009' ws
```

A *number* is very much like a C or Java number, except that the octal and hexadecimal formats are not used.



Whitespace can be inserted between any pair of tokens. Excepting a few encoding details, that completely describes the language.



8th
- json

ActionScript
- ActionScript3

Ada
- GNATCOLL.JSON

AdvPL
- JSON-ADVPL

APL
- JSON

ASP
- JSON for ASP
- JSON ASP utility class

AWK
- JSON.awk
- rhawk

BlitzMax
- bmx-rjson

C
- JSON_checker
- YAJL
- LibU
- json-c
- json-parser
- jsonsl
- WJElement
- M's JSON parser
- cJSON
- Jansson
- jsmn
- parson
- ujson4c
- nxjson
- frozen
- microjson
- mjson
- progbase

C++
- JSONKit
- jsonme--
- ThorsSerializer
- JsonBox
- jvar
- rapidjson
- JSON for Modern C++

ColdFusion
- SerializeJSON
- toJSON

D:
- Libdjson

Dart
- json library

Delphi
- Delphi Web Utils
- JSON Delphi Library

E
- JSON in TermL

Fantom
- Json

FileMaker
- JSON

Fortran
- json-fortran
- YAJL-Fort
- jsonff

Go
- package json

Groovy
- groovy-io

Haskell
- RJson package
- json package

Java
- JSON-java
- JSONUtil
- jsonp
- Json-lib
- Stringtree
- SOJO
- json-taglib
- Flexjson
- Argo
- jsonij
- fastjson
- mjson
- jjson
- json-simple
- json-io
- google-gson
- FOSS Nova JSON

- minijson
- jsoncons
- jsoncpp
- univalue
- ArduinoJson
- QJson
- CAJUN
- libjson
- nosjob
- JSON++
- JSON library for IoT
- qmjson
- JSON Support in Qt
- JsonWax for Qt
- progbase
- Qentem-Engine

C#
- fastJSON
- JSON_checker
- Jayrock
- Json.NET - LINQ to JSON
- JSON for .NET
- Manatee Json
- FastJsonParser
- LightJson
- liersch.json
- progbase

Clojure
- data.json

Cobol
- XML Thunder
- Redvers COBOL JSON Interface

- Corn CONVERTER
- Apache johnzon
- Genson
- cookjson
- progbase

JavaScript
- JSON
- json2.js
- clarinet
- Oboe.js
- progbase

LabVIEW
- flatten

Lisp
- Common Lisp JSON
- Emacs Lisp

LiveCode
- mergJSON

LotusScript
- JSON LS

Lua
- JSON Modules

M
- DataBallet

Matlab
- JSONlab
- 20565
- 23393

Net.Data
- netdata-json

Nim
- Module json

Objective C
- NSJSONSerialization
- json-framework
- JSONKit
- yajl-objc
- TouchJSON

OCaml
- jsonm

PascalScript
- JsonParser

Perl
- CPAN

Photoshop
- JSON Photoshop Scripting

PHP
- PHP 5.2

PicoLisp
- picolisp-json

Pike
- Public.Parser.JSON
- Public.Parser.JSON2

PL/SQL
- pljson

Prolog
- JSON
- JSON Logo
- Heresy

- Jekejeke

PureBasic
- JSON

Puredata
- PuRestJson

Python
- The Python Standard Library
- simplejson
- pyson
- Yajl-Py
- ultrajson
- metamagic.json
- progbase

R
- rjson
- jsonlite

Racket
- json-parsing

Rebol
- json.r

RPG
- JSON Utilities

Rust
- Serde JSON
- json-rust

Ruby
- yajl-ruby
- json-stream
- progbase

Scala
- circe

Scheme
- MZScheme
- PLT Scheme

Shell
- Jshon
- JSON.sh
- jwalk

Squeak
- Squeak

Tcl
- JSON

Visual Basic
- VB-JSON
- PW.JSON
- .NET-JSON-Transformer
- progbase

Visual FoxPro
- fwJSON
- JSON
- vfpjson