JSON INTRODUCTION

JSON (JavaScript Object Notation)
is a lightweight, text-based data interchange file format for storing and interchanging data.

JSON uses key value pairs and arrays, making it easy for humans to read/write to (compare to ANSI!) AND machine systems to parse and generate.

JSON is widely used in web applications for data transfer between servers and web pages, acting as a common language for APIs, especially those following the REST architecture style.

It should be noted that the common types and architectures of web APIs are:
- REST
- SOAP
- GraphQL
- gRPC
- WebSocket

Each style is designed to address specific communication needs and performance requirements, with the choice depending heavily on the use case.

REST APIs are the most common type. REST APIs use JSON data storage.

SOAP APIs use XML for data exchange.

graphQL does not have a data storage method, it serves as a functioning layer.

gRPC uses **Protocol Buffers (Protobuf)** as its primary data serialization format and Interface Definition Language (IDL). The data is ultimately stored and transmitted as a compact, efficient **binary format**.

WebSocket can use either JSON or raw binary data storage.

So understanding JSON is the beginning of understanding APIs. JSON is an API data storage method, at its core. APIs send and receive data to and from servers. JSON is currently the standard for data file storage, REST APIs are the most common.

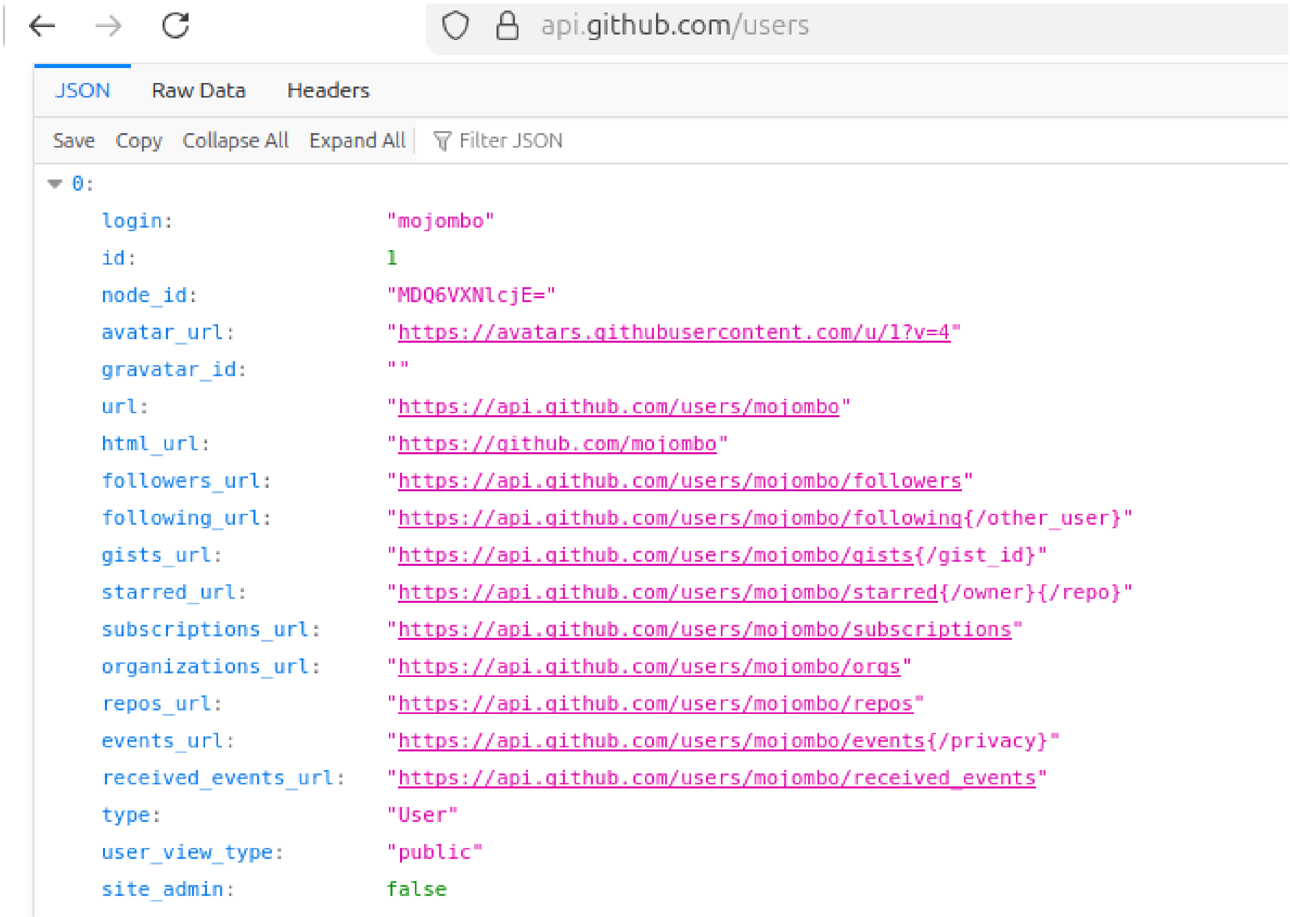
Backend APIs typically fetch data from or post data to a server (see HTTP for more on this.)

APIs can be public or private. A public API may be used by developers openly.

Syntax: The syntax of JSON is very similar to Javascript object literals.

Example of an API listing from Github (Github lists the first 20):

notice the use of key value pairs in the syntax.



```
▾ 0:
    login:                  "mojombo"
    id:                     1
    node_id:                "MDQ6VXNlcjE="
    avatar_url:             "https://avatars.githubusercontent.com/u/1?v=4"
    gravatar_id:            ""
    url:                    "https://api.github.com/users/mojombo"
    html_url:               "https://github.com/mojombo"
    followers_url:          "https://api.github.com/users/mojombo/followers"
    following_url:          "https://api.github.com/users/mojombo/following{/other_user}"
    gists_url:              "https://api.github.com/users/mojombo/gists{/gist_id}"
    starred_url:            "https://api.github.com/users/mojombo/starred{/owner}{/repo}"
    subscriptions_url:      "https://api.github.com/users/mojombo/subscriptions"
    organizations_url:      "https://api.github.com/users/mojombo/orgs"
    repos_url:              "https://api.github.com/users/mojombo/repos"
    events_url:             "https://api.github.com/users/mojombo/events{/privacy}"
    received_events_url:    "https://api.github.com/users/mojombo/received_events"
    type:                   "User"
    user_view_type:         "public"
    site_admin:             false
```

There is a distinction made between JSON data and JSON files. They are not exactly the same thing.

A JSON file typically has an array of JSON objects within it.

JSON files are typically system-generated, not hand coded by the user. However, user actions may lead to the creation or updating of JSON files.

Purposes:

JSON (JavaScript Object Notation) is primarily used for **exchanging structured data** between a server and a web application (APIs), storing **configuration settings**, and **transferring data** in a language-independent, human-readable format, making it ideal for web apps, mobile apps, and various software systems. Its simplicity, efficiency, and broad support allow different technologies to communicate seamlessly.