API DOCUMENTATION:

WHAT IS AN API:

Application Programming Interface (API), is a set of protocols that lead different pieces of software, communicate with each other and share data.

Developers use APIs to connect chunks of code from different places in order to create the web and mobile applications we use everyday. APIs are commonly used to enable integration between different software systems allowing them to work seamlessly.

Why do we really need AN API:

APIs allow developers to access the functionality or data of one system from another. APIs support scalability, Integration, Reuse, Modularity. APIs are meticulously documented to provide developers with clear guidelines on usage, endpoints, parameters, authentication methods, and response formats, ensuring smooth integration and efficient development processes.

The process of using API typically involves the following steps,

- Understanding the API.
- Authentication
- Making requests
- Handling responses
- Error handling
- Iterating and testing

Types of API:

APIs come in various types for different needs and functionalities.

- **Web APIs-** These are APIs accessed over the web using HTTP/HTTPS protocols
- **RESTful APIs-** They use standard HTTP methods like GET, POST, PUT, and DELETE for crud operations.
- **SOAP APIs-** Simple object access protocol (SOAP) APIs use XML as their messaging format and can operate over various protocols.
- **JSON-RPC (Remote procedure call) and XML-RPC APIs-** These APIs allow programs to execute procedures or functions on remote servers.
- **Backend-as-a-service(BaaS)-** BaaS APIs provide cloud-based backend services such as user authentication, database storage, and push notifications, which developers can use for the development of mobile and web applications.
- **Service APIs-** Service APIs expose the functionality of a specific service or application, allowing clients to interact with its features programmatically.

Components of APIs:

APIs consist of several components. Let's explore the components of REST APIs,

API requests:

An API request is a message sent from a client application to a server application to request specific functionality or data provided by the server's API. An API request to REST API consists of the following components,

- **Endpoint:** Every API request is directed to the API endpoint. It tells the API server where the request should go and what action it should take. They help ensure that each request is handled properly and efficiently, directing it to the appropriate part of the API server.
- **Request methods:** Every API request must include a method, which defines the operation that the client would like to perform on the specified resource. REST APIs are accessible through standard HTTP methods, such as GET, POST, PUT, and DELETE.
- **Request header:**
  API headers provide additional information about the request. There are two main types of headers,
  Content-Type header-The header which specifies the format of data you're sending in the request body such as json or XML and **Authorization-** The header which provides the authentication credentials like an API key or oAuth2 token to authenticate the requester.
- **Request body:** In an API request, the request body includes the specific details or the data necessary for the server to perform a certain action such as creating, updating, or deleting a resource.
- **Authentication and Authorization:** Authentication and Authorization are essential aspects of API requests that ensure the security and integrity of the communication between the client application and the server application.
- **Request parameters:** In an API, a parameter is a piece of information that you can include with your request to provide specific instructions or data to a server. Parameters allow you to customize the behavior of the API or to filter the data you receive in the response.

- **Response format:** In an API the response format refers to the way the server formats the data and it sends back to the client in response to a request.
- **Documentation:** Documentation in an API refers to the collection of information, guides and instructions provided by the help API creators to help developers. It includes such as overview, endpoints, methods, parameters, authentication and error handling.

HTTP Methods:

Hypertext transfer protocol (HTTP) is fundamental when it comes to API development and usage because it serves as a foundation for communication between clients and servers over the internet. It defines the operation that the client would like to perform on the specified resource.HTTP provides Standardized protocol, Stateless communication, Versatility, Uniform resource identification, Security.

Restful web services use HTTP method and client request. The most common methods being used is,

- GET (fetch is a resource from the server)
- POST (Requests for a resource to be created on the server)
- PUT (Request for a resources to be updated)
- DELETE (Request for a resource to be deleted)

API Response:

HTTP status code:

HTTP and HTTP status code are intertwined together as they both play a very important role in communication between client and servers.

API status codes are HTTP status codes that are returned by an API to indicate the status of a client's request. Some of the most commonly used status codes are,

- 200 OK
- 404 error found
- 401 unauthorized
- 500 internal server error (represents service side error)

Conclusion:

APIs simplify the design and development of new applications and services, and the integration and management of existing ones. They also offer significant benefits to developers and organizations at large. By providing comprehensive documentation, developers can accelerate the development process, ensure seamless integration, and enhance the overall user experience. Well documented APIs enable businesses to unlock new opportunities, efficiently scale their services, and deliver value to users.