**Web API**

**Data Science Master’s Assignment**

**18th Feb 2023**

**Q1. What is an API? Give an example, where an API is used in real life.**

**Sol.** An API is a communication interface that **allows two separate software components to share data**. An API operates as a bridge between internal and external software operations, allowing for a fluid interchange of data that frequently passes undetected by the end-user.

Example :- Weather Snippets

**Q2. Give advantages and disadvantages of using API.**

**Sol.** **Advantages of using API.**

It offers several benefits for both developers and businesses:

#### Increased Visibility and Traffic

First, it allows you to share your data and functionality with a broader audience, increasing traffic and visibility for your website or app.

#### Seamless Integration

It makes it easy to integrate with other applications and services, saving you time and money.

#### Increased Efficiency

It allows you to access data and functionality without navigating multiple menus or screens. This can speed up the development process and make your app or website more user-friendly.

#### Easier Maintenance

It reduces the amount of work needed on the back-end, making maintenance and updates more effortless and less time-consuming.

#### Reduced Costs

It allows developers to reuse code and functionality in multiple applications, saving time and money.

#### Improved Customer Experience

It makes it easier for users to access your data and functionality across multiple devices or platforms, improving the user experience and increasing customer satisfaction.

**Disadvantages of using API.**

There are some disadvantages to using Application Programmable Interfaces:

#### Increased Complexity

First, they can be complex and challenging to use, making them challenging for novice developers.

#### Limited Functionality

They may not have all the functionality you need, requiring additional development work.

#### Dependency on Third Party Services

If it depends on a third-party service, your application will also be unavailable.

#### Security and Privacy Risks

They can pose security and privacy risks if they’re not implemented correctly. Therefore, it’s essential to carefully consider these risks before using them in your application.

**Q3. What is a Web API? Differentiate between API and Web API.**

**Sol.** A Web API stands for Application Programming Interface. It is a software application that allows two different applications or machines to interact with each other without any user interference. The API contains a complete set of rules and specifications used when interacting with any web application.

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| **Web Services** | **Web API** |
| Web service is used to communicate between two machines on a network. | Web API is used as an interface between two different applications for communicating with each other. |
| It uses HTML requests that can be compressed, but XML data cannot be compressed. | Data can be compressed. |
| Generally, it uses the HTTP protocol for communication. It also uses SOAP, REST, and XML-RPC as communication. | It may use any means of communication protocols such as HTTP/HTTPS to initiate the interaction between applications. |
| A web service is just an API wrapped in HTTP. | It's not always be a web-based |
| All Web Services are APIs. | All APIs are not web services. |
| It does not have a complete set of specifications, and sometimes it cannot perform all the functions that can be executed by the WEB API. | An API is a complete set of rules and specifications that follow to facilitate the interaction. |
| It uses XML as structured data for exchanging information and communication. | It uses XML, JSON or plain data as structured data. |

**Q4. Explain REST and SOAP Architecture. Mention shortcomings of SOAP.**

**Sol.** **SOAP** is a protocol which was designed before REST and came into the picture. The main idea behind designing SOAP was to ensure that programs built on different platforms and programming languages could exchange data in an easy manner. SOAP stands for Simple Object Access Protocol.

**REST** was designed specifically for working with components such as media components, files, or even objects on a particular hardware device. Any web service that is defined on the principles of REST can be called a RestFul web service. A Restful service would use the normal HTTP verbs of GET, POST, PUT and DELETE for working with the required components. REST stands for Representational State Transfer.

**Q5. Differentiate between REST and SOAP.**

**Sol.**

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| **SOAP API** | **REST API** |
| Relies on SOAP (Simple Object Access Protocol) | Relies on REST (Representational State Transfer) architecture using HTTP. |
| Transports data in standard XML format. | Generally transports data in JSON. It is based on URI. Because REST follows stateless model, REST does not enforces message format as XML or JSON etc. |
| Because it is XML based and relies on SOAP, it works with WSDL | It works with GET, POST, PUT, DELETE |
| Works over HTTP, HTTPS, SMTP, XMPP | Works over HTTP and HTTPS |
| Highly structured/typed | Less structured -> less bulky data |
| Designed with large enterprise applications in mind | Designed with mobile devices in mind |