1. Do some research on the Python requests module. Explain what it is, and how it is used to make HTTP requests.
   - The Python requests module is a library tool that sends Hypertext Transfer Protocol (HTTP) requests and interacts with web resources to allow a user to easily send GET, POST, PUT, PATCH, HEAD, and DELETE requests to web servers, handle responses, and work with REST APIs and web scraping tools.
   - GET is used to retrieve information from the server
   - POST is used to send data to the server to create or update resources
   - PUT is used to replace the target resource with new data
   - PATCH is used to apply partial modifications to a resource
   - HEAD is used to retrieve headers ONLY
   - DELETE is used to delete specified resources
2. Document your independent findings on the JSON and XML data formats and what they are used for. List at least four advantages and four disadvantages of each data format.
   - A **JSON** file is a file that stores simple data structures and objects in JavaScript Object Notation (JSON) format, which is a standard data interchange format. It is primarily used for transmitting data between a web application and a server.
     - ***Advantages:***
       Simple Syntax: Easy to read and write due to its minimal structure
       Lightweigh**t**: Less verbose than XML, making it faster to transmit and parse.
       Native JavaScript Support: Seamlessly integrates with JavaScript-based applications.
       Human-Readable: Clean formatting makes it easy for developers to debug and understand.
     - ***Disadvantages:***
       Verbose Syntax: More characters and tags make XML larger and slower to parse.
       Complexity: Harder to read and write compared to JSON.
       Slower Performance: Parsing XML takes more time and resources.
       Less Natural Integration: Not as seamless with modern web technologies such as JavaScript.

   - **XML** is a markup language that is designed to store data. It is case sensitive. XML allows you to define markup elements and generate customized markup language.

- **_Advantages:_**
  ~ Platform Independence: XML works across different operating systems, programming languages, and applications, making it ideal for data exchange between heterogeneous systems.
  ~ Extensibility: You can define your own tags and structure, allowing XML to adapt to various data formats and domains.
  ~ Self-Descriptive Structure: XML documents describe their own structure through tags, which makes them easier to understand and debug.
  ~ Schema Support: XML supports validation through DTD (Document Type Definition) or XSD (XML Schema Definition), ensuring data integrity and consistency.
- **_Disadvantages:_**
  ~ Verbosity: XML files are often large due to excessive tagging, which increases bandwidth usage and slows down processing.
  ~ Complexity: Designing and parsing XML can be more complex compared to simpler formats like JSON or CSV.
  ~ Slower Performance: XML parsing is slower and more resource-intensive, especially for large datasets.
  ~ Not Ideal for Binary Data: Encoding binary data (like images or files) in XML is inefficient and can double the data size.

3. Provide a brief explanation of what a RESTful API is, how it works and what it is used for. List at least four advantages and four disadvantages of RESTful APIs.
   - RESTful API is an interface that 2 computer systems use to exchange information in a secure manner, over the internet.
   - A client must follow the API documentation to format and send a request to the server. The server verifies the client and confirms whether or not the client has the right to make a request. Once the verification is passed, the server receives the request and processes it . The server then returns a response that contains information to tell the client whether the request was successful or not . The response will also include any requested information.
   - Advantages:
     ~ It is easy to understand and implement
     ~ Fast data interchange format
     ~ It is easy to modify (flexible)
     ~ Caching is easier
   - Disadvantages
     ~Design complexity

~ Requires a constant internet connection
~ No built-in security
~ Limited Functionality for Complex Operations