https://developer.mozilla.org/en-US/docs/Learn/Common_questions/How_does_the_Internet_work

1) How does the Internet work?

+ The **Internet** is the backbone of the Web, the technical infrastructure that makes the Web possible. At its most basic, the Internet is a large network of computers which communicate all together.

https://www.youtube.com/watch?v=x3c1ih2NJEg

https://www.youtube.com/watch?v=7_LPdttKXPc

2) Website basics:

+ They are a collection of web pages and are referred to by a domain name (like google.com, facebook.com).

Each web page is referred to by its URL or Uniform Resource Locator.

a) **What is a web page and website?** A website is a collection of web pages. So website would be like a house and each webpage would be a room inside the house.

b) **Breakdown of a URL: URL** stands for *Uniform Resource Locator*. A URL is nothing more than the address of a given unique resource on the Web. In theory, each valid URL points to a unique resource. Such resources can be an HTML page, a CSS document, an image, etc. In practice, there are some exceptions, the most common being a URL pointing to a resource that no longer exists or that has moved. As the resource represented by the URL and the URL itself are handled by the Web server, it is up to the owner of the web server to carefully manage that resource and its associated URL.

example:

```
https://developer.mozilla.org

https://developer.mozilla.org/en-US/docs/Learn/
```

c) **Querying**: A **query string** is a part of a uniform resource locator (URL) that assigns values to specified parameters

example:

An address bar on Google Chrome showing a URL with the query string `title=Query_string&action=edit`.

d) Different parts of a website and how to mess with it (HTML, CSS, JS, Backend)

+ HTML breakdown: https://www.w3schools.com/html/html_basic.asp

+CSS breakdown: https://www.w3schools.com/css/css_intro.asp

e) Viewing source: By right clicking on Google Chrome you can select the option “View Page Source” to see the code that the website is running on your computer. It allows you to see the HTML and CSS that is running on the website and it will also let you see the Javascript scripts running on your computer. The best part is, that you can edit the HTML directly and see it affect the website, so it lets you modify the website as you desire. You can also select “Inspect Element” to see the code that is running in a specific part of a website.

f) JS breakdown: Javascript is used because it allows us to add interactivity between the user and the website. Javascript allows the user to interact with the website and have the website respond.

+Basics: https://www.w3schools.com/js/js_htmldom_html.asp

3) HTTP breakdown:

a) what is HTTP (Hypertext Transfer Protocol) : It provides a standardized way for computers to communicate with each other over the internet. HTTP is a communication protocol, that is used to deliver data (HTML files, image files, query results, etc.) over the internet. HTTP dictates how data is sent between clients (you) and servers.

Example: A client (browser) sends an HTTP request to the server; then the server returns a response to the client. The response contains status information about the request and may also contain the requested content.

b) GET and POST request:

Link: https://www.w3schools.com/tags/ref_httpmethods.asp

GET is used to request data from a specified resource.

GET is one of the most common HTTP methods.

Note that the query string (name/value pairs) is sent in the URL of a GET request:

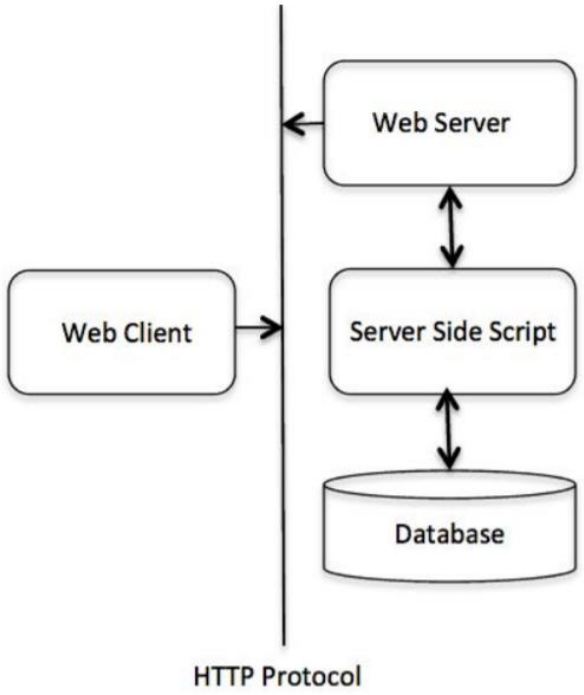
```
/test/demo_form.php?name1=value1&name2=value2
```

POST is used to send data to a server to create/update a resource.

The data sent to the server with POST is stored in the request body of the HTTP request:

```
POST /test/demo_form.php HTTP/1.1
Host: w3schools.com
name1=value1&name2=value2
```

c) Basic architecture:



d) Basic idea of a proxy: A proxy server is a computer on the web that redirects your web browsing activity. When you try to access any website,

your Internet Service Provider (ISP) makes the request for you and gives the website your IP address. So when you use a proxy, your request goes from your ISP to the proxy server to the website you want to go to. This way allows you to mask your IP address as another address so that the websites you access don't know who you are.

Một số hãng hoặc công ty sử dụng proxy với mục đích: Giúp nhiều máy tính của công ty truy cập Internet thông qua một máy tính đại diện cùng với tài khoản truy cập nhất định, đại diện máy tính này được gọi là Proxy server. Chỉ duy nhất máy Proxy này cần modem và account truy cập Internet, các máy client (các máy trực thuộc) muốn truy cập Internet qua máy này chỉ cần nối mạng LAN tới máy Proxy và truy cập địa chỉ yêu cầu. Những yêu cầu của người sử dụng sẽ qua trung gian proxy server thay thế cho server thật sự mà người sử dụng cần giao tiếp, tại điểm trung gian này công ty kiểm soát được mọi giao tiếp từ trong công ty ra ngoài Internet và từ Internet vào máy của công ty. Sử dụng Proxy, công ty có thể cấm nhân viên truy cập những địa chỉ web không cho phép, cải thiện tốc độ truy cập nhờ sự lưu trữ cục bộ các trang web trong bộ nhớ của proxy server và giấu định danh địa chỉ của mạng nội bộ gây khó khăn cho việc thâm nhập từ bên ngoài vào các máy của công ty.

4) Database breakdown

+ What they are and why they are useful ?? A database is a collection of information that is organized so that it can be easily accessed, managed and updated. Databases can quickly query data and add/delete data instantly. They are used to hold every kind of data.

+ SQL and others:

SQL is Structured Query Language (SQL), a programming language used for managing relational databases. Relational databases are tabular database in which data is defined so that it can be reorganized and accessed in a number of different ways. Relational databases are easy to extend, and a new data category can be added after the original database creation without requiring that you modify all the existing applications. Relational databases are made up of a set of tables with data that fits into a predefined category. Each table has at least one data category in a column, and each row has a certain data instance for the categories which are defined in the columns.

+ How they integrate into sites??

Databases are integrated into websites because they are the most optimal way to display/store data. User information like passwords are stored using databases. Databases also allow for quickly modifying the data displayed on the website. So if someone wants to update information on a website instead of modifying the HTML on the website, they can just change the data on the database that is displayed on the website.

+ Basic SQL syntax:

- SELECT: extracts data
- ORDER BY: Orders the results gotten from SELECT in a specific manner. For example, if one has a table of countries and their populations. One can select the countries starting with the letter R and then order them by their population.
- JOIN: Joins data from two tables depending on a certain characteristic on the table. So if a theres two table one with customer IDs and their addresses and another table with customer IDs and their purchases. You can join both tables so that the customer addresses match their purchases.
- DELETE, INSERT: Allows you to delete data or add new data to a table
- AND,OR: Allows you to modify queries so that they return information depending on multiple categories.
- MIN,MAX: They return the smallest or largest value of a query

5) Perform a PHP object injection? Follow this link: https://www.tarlogic.com/blog/how-php-object-injection-works-php-object-injection/