How the Web Works?

1. entering URL:
- ~~enter~~ A website's address or URL (Uniform Resource Locator, which is a unique identifier to locate resource on the Internet) is searched in a brower

2. Requesting IP address:
- your computer needs the website's IP address to find the location
- it asks DNS Server (Domain Name System) to translate the URL into an IP address like 192.168.1.1.

3. DNS LookUP:
- The DNS Server looks up its records and finds and sends back the IP adress to the computer.

4. Connection:
- Once the browsers gets back IP address to the website, it finds the server on the Internet and estabish a connection.
- Using the public Internet routing infrastructure, packets from a client browser request get routed through the router, the ISP, through an internet exchange to switch ISP or networks, all using transmission control protocol (TCP), to find the server with the IP to connect to. But its very roundabout & inefficient
- Instead, many websites ~~use~~ uses a CDN (Content Delivery Network) to cache static and dynamic content closer to the browser.

- Once the browsers finds the server, it establishes a TCP connection with the servers and if HTTPS is being used, a TLS handshake takes place to secure connection (Transport Layer Security)

5. HTTP/HTTPS Request:
- Browser sends HTTP (HyperText Transfer Protocol) requests to the server, asking for the page you want to view.
- HTTPS (Secure) adds encryption to keep data safe.

6. Server responds:
- The server receives the request, and based on the info in the request line, headers, and body, decides how to process the request, and sends back to browser.

IP: 192 (1st octet) . 168 (2nd octet) . 1 (3rd octet) . 1 (4th Octet) → IPV4
: 2001:0db8:85a3:0000:0000:8a2e:0370:7334 (IPv6)
URL: www (sub-domain) . example (Second-Level SLD) . com (Top-level TLD)

7. Downloading files and rendering content:
- Once the response is received, the browser inspects the response headers for info on how to process or render the resource.
- The Content-Type header tells the browser that it has received HTML resource in the response body.
- Browser reads the HTML file first.
- As it is passing and rendering the HTML, it makes additional requests to get Javascript, CSS and images, and data.
- Browser combines all these files and displays a fully rendered web page.

8. Interaction:
- Browser may need to send more requests to the server for additional resources as we interact with links and buttons.

9. Closing connection: or tabs terminated
- When the browser's closed, the connection is closed too.