**Task 1:**

**1. Difference between HTTP1 and HTTP2**

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| **HTTP1** | **HTTP2** |
| It uses text command to complete request response cycle | It uses binary command (0s and 1s) to complete request response cycle |
| If there aretwo requests to be performed, HTTP1 requires two separate connections to perform the two different tasks | Server push capability allows the server to send additional cacheable information to the client that isn’t requested but is anticipated in future requests |
| Files in HTTP1 protocol are downloaded one by one. | It allows asynchronous file downloading |
| The server can accept the resources in the order they are pushed | The server can prioritize pushed resources. |
| Reusing resources in the cache is not possible as the cache memory is under- utilized in HTTP1 | The client saves pushed resources in the cache. The client can reuse these cached resources across different pages. |
| Headers are used as they are received and hence redundant header frames are not ignored. | HTTP/2 compress a large number of redundant header frames. It uses the HPACK specification as a simple and secure approach to header compression. |

**2. HTTP Version history**

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| **Version** | **Year** | **Methods** |
| 0.9 | 1991 | GET |
| 1.0 | 1996 | GET, HEAD, POST |
| 1.1 | 1997 | GET, HEAD, POST, PUT, DELETE, TRACE, OPTIONS |
| 2.0 | 2015 | GET, HEAD, POST, PUT, DELETE, TRACE, OPTIONS, CONNECT, PATCH |
| 3.0 | 2020 | **NA** |

**3. Differences between JS and NodeJs**

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| **JS(Console)** | **NodeJs** |
| Javascript is a programming language that is used for writing scripts on the website. | NodeJS is a Javascript runtime environment. |
| It is basically used on the client-side. | It is mostly used on the server-side. |
| Javascript is capable enough to add HTML and play with the DOM. | Nodejs does not have capability to add HTML tags. |
| It is the upgraded version of ECMA script that uses Chrome’s V8 engine written in C++. | Nodejs is written in C, C++ and Javascript. |
| JavaScript running any engine like Spider monkey (FireFox), JavaScript Core (Safari), V8 (Google Chrome). | Node JS only run in a V8 engine which mainly used by google chrome. And javascript program which will be written under this Node JS will be always run in V8 Engine. |

**4. What happens when an url is typed in the address bar in the browser?**

URL stands for Uniform Resource Locator. URL is the address of the website which you can find in the address bar of your web browser. It is a reference to a resource on the internet, be it images, hypertext pages, audio/video files, etc.

DNS is short for Domain Name System. Like a phonebook, DNS maintains and maps the name of the website, i.e. URL, and particular IP address it links to. Every URL on the internet has a unique IP address which is of the computer which hosts the server of the website requested.

Steps for what happens when we enter a URL :

1. Browser checks cache for DNS entry to find the corresponding IP address of website.
2. It looks for following cache. If not found in one, then continues checking to the next until found.

* Browser Cache
* Operating Systems Cache
* Router Cache
* ISP Cache

1. If not found in cache, ISP’s (Internet Service Provider) DNS server initiates a DNS query to find IP address of server that hosts the domain name.
2. The requests are sent using small data packets that contain information content of request and IP address it is destined for.
3. Browser initiates a TCP (Transfer Control Protocol) connection with the server using synchronize (SYN) and acknowledge (ACK) messages.
4. Browser sends an HTTP request to the web server. GET or POST request.
5. Server on the host computer handles that request and sends back a response. It assembles a response in some format like JSON, XML and HTML.
6. Server sends out an HTTP response along with the status of response.
7. Browser displays HTML content