Q.No:1 Describe DNS, HTTP Status Code, Port Number and HTTP Request Methods.

Ans:

DNS:

The Domain Name System (DNS) is basically a large database which resides on various computers and it contains the names and IP addresses of various hosts on the internet and various domains.

The Domain Name System is used to provide information to the Domain Name Service to use when queries are made.

DNS is a globally distributed, scalable, reliable database, comprised of three components

A “name space”

Servers making that name space available

Resolvers (clients) which query the servers about the name space

Why we use?

- DNS as a Database

  Keys to the database are “domain names”

  Each domain name contains one or more attributes

  Known as “resource records”

  Each attribute is individually retrievable

- Global Distribution

  Data is maintained locally, but retrievable globally

- Loose Coherency

  The database is always internally consistent

  Each version of a subset of the database (a zone) has a serial number

  Which is incremented on each database change.

- Scalability

  No limit to the size of the database or number of queries.

  One server has over 20,000,000 names

  24,000 queries per second handled easily

- Reliability

  Data is replicated

  Data from master is copied to multiple slaves

- Dynamicity

  Database can be updated dynamically

Add/delete/modify of any record

Components:

There are 3 components:

Name Space:

Specifications for a structured name space and data associated with the names

Resolvers:

Client programs that extract information from Name Servers.

Name Servers:

Server programs which hold information about the structure and the names.

HTTP Status codes:

Status codes are open or closed sign from pages to the search crawlers(used by search engines e.g google, bing).

Status code tell the crawler to either continue or not, and also on how to deal with the content on the page.

The wrong status code cam send the wrong signal the a search crawler and a negatively affect crawlability and rankability of a website page.

Most common status codes:

200: status code 200 is response to the successful HTTP request.

301: It is known as a permanent redirect.

302: It is known as temporary redirect.

404: It is a response to notify that the page is no longer accessible to the search crawlers.

500: It is a response to notify that a server error exist and no content is accessible to the search crawlers / search engines.

Tools to check status code of page:

1. Screaming Frog
2. Xenu's Links Sleuth

Port Numbers:

A client machine is capable of browsing multiple webpages originated from different web servers simultaneously. Ports help to identify the process running on the host machine uniquely.

Every process is identified by a 16-bit port number. When a webpage is opened, a port number is created automatically to identify the process uniquely. And when the page is closed port gets released back automatically.

Ports are used on the transport layer by TCP and UDP protocols to choose among multiple processes running on destination host.

Port is represented by 16-bit integer value b/w 0 to 65535.

Some ports have been reserved to support common/well known services.

FTP:21/tcp

telnet: 23/tcp

smtp: 25/tcp

login: 513/tcp

IANA(Intenet assigned number authority) has divided port numbers iin to three ranges:

1. Well known ports_:
   RANGE FROM 0 TO 1023.
2. Registered ports:
   Ranges from 1024 to 49,151.
3. Dynamic ports:
   Ranges from 49152 to 65,535. They are used by any process temporarily.

HTTP Request methods:

HTTP defines a set of request methods to indicate the desired action to be performed for a given resource

1. **Get:**
   The GET method requests a representation of the specified resource. Requests using GET should only retrieve data.
2. HEAD
   The HEAD method asks for a response identical to a GET request, but without the response body.
3. POST

The POST method submits an entity to the specified resource, often causing a change in state or side effects on the server.

4. PUT
   The PUT method replaces all current representations of the target resource with the request payload.

5. DELETE
   The DELETE method deletes the specified resource.

6. CONNECT
   The CONNECT method establishes a tunnel to the server identified by the target resource.

7. OPTIONS
   The OPTIONS method describes the communication options for the target resource.
8. TRACE
   The TRACE method performs a message loop-back test along the path to the target resource.

9. PATCH
   The PATCH method applies partial modifications to a resource.

Q.No:2 What are Chrome DevTools? Also explain Different Tab

Ans: The chrome developer tool has made debugging a lot easier. The built-in developer tool allows us to edit the page, debug it and also gives access to work on the internal web browser and application.

Accessing developer tool is ver easy, we can right-click on an element on the website and select Inspect from there. We will see a lot of panels or tabs in devTool. These tabs give us a lot of functionalities. Some of them are discussed below:

1. Easy Access on Desktop or Mobile

   The second tab in the left corner is used to check your application view on mobile or desktop. It allows us to check how our application will look

on different devices or different screen sizes. It is mainly used to check the responsiveness of your website.

2. Element Tab

This tab is mainly used to debug the code of HTML and CSS in our website. Whenever we need to change something in the styling of your HTML and CSS and you want to see how it will reflect in our website, you can do that with the help of this tab. Elements tab allows you to interact with the DOM, change it and view it. This tab helps you in taking a closer look at DOM structure and identifying the HTML elements rendered in it.

3. Console

This tab helps us in debugging the JavaScript code. We can view the logged message and run the JavaScript code here. This tab helps us in showing the error along with the line number in our source code. This property is really helpful in debugging the source code.

4. Network

This tab is mainly used to detect the upload or download request made by a webpage. We can log all network activity in the Network log. We can open the network panel and then reload the webpage.

5. Performance

As the name suggests, this tab is used to optimize the loading speed of our website. We can analyze the runtime performance of the web page. Capture setting allows us to capture the performance metrics settings.

6. Security

We will be using this tab for any kind of security concern. This tab is used to ensure that HTTPS is properly implemented on a page. We can also view the SSL certificate issued on the web page. The authenticity of the page gets certified with the help of this tab.

Q.No:3 What is ECMAScript? Discuss different ECMA Standards.

Ans:

ECMAScript is the scripting language standardized by Ecma International in the ECMA-262 specification. In short, ECMAScript is a language specification.

Many languages follow and implement the ECMAScript specification, e.g., JavaScript, ActionScript, Nashorn.
Ecma international releases standard specifications from time to time. The current edition is the Ecma-262 Edition 5.1. Currently, most browsers offer full support for JavaScript ECMAScript 5.1 edition.
Some Standadrs:

1. **ECMAScript 4 :**

ES4 was a proposed update to the JavaScript language that was never officially released. It was intended to add many new features and capabilities to the language, but it faced opposition from some members of the JavaScript community and was ultimately abandoned.

2. **ECMAScript 5:**

ES5 is also known as ECMAScript 2009 as it is released in 2009. It is a function contractors focus on how the objects are instantiated. For ES5 you have to write function keyword and return, to be used to define the function, like normal general JavaScript language.

3. **ECMAScript 6 :**

ES6 is also known as ECMAScript 2015 as it is released in 2015. Its class allows the developers to instantiate an object using the new operator, using an arrow function, in case it doesn't need to use function keyword to define the function, also return keyword can be avoided to fetch the computer value.

Q.No:7 Bootstrap vs Tailwind? Also provide code snippets for at least 3 different cases.

Ans:

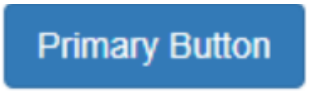
Tailwind CSS	Bootstrap
Tailwind offers predesigned widgets to build a site from scratch with fast UI development.	Bootstrap comes with a set of pre-styled responsive, mobile-first components that possess a definite UI kit.
Tailwind CSS uses a set of utility classes to create a neat UI with more flexibility and uniqueness.	Sites created using Bootstrap follow the generic pattern that makes them look identical.

Websites created using Tailwind CSS are much more customizable.	Websites created with Bootstraps are known for their responsiveness and flawless design, but the looks are generic and similar.
Tailwind CSS is relatively newer, and there is still much room to grow in terms of its community, however, it is growing day by day, and the number of users, references, tools, and websites related to it are also increasing.	Bootstrap is efficient and saves a lot of time. It has been around for more than nine years and being the most popular CSS Framework, it has a large community of developers, forums, tools, and so on.
Tailwind CSS only needs the base stylesheet file, which amounts up to 27kb making it lighter.	Bootstrap has four files that are required to include in project to get the full benefit of the CSS Framework. The total size of these files is 308.25kb including, jQuery, Popper.js, Bootstrap JS, and the main Bootstrap CSS file.
Tailwind CSS is used by BlaBlaCar, Exyplis, and Bazzite.	Spotify, Twitter, and Lyft are some of the famous companies that use Bootstrap.

Code exmaples:

1. Bootstrap:
   a. Button:

```
<button type="button" class="btn btn-primary">
        Primary Button
</button>
```



We can see it is quite simple to make a button in Bootstrap, but what if we need to change the styling of this button. We would need another unique class for doing that.

   b. Grid:

```
<div class="row"  style="background-color: skyblue;">
```

```
<div class="col-sm-4" > 1 </div>
<div class="col-sm-4" > 2 </div>
<div class="col-sm-4" > 3 </div>
<div class="col-sm-4" > 4 </div>
<div class="col-sm-4" > 5 </div>
<div class="col-sm-4" > 6 </div>
</div>
```

c. Simple label:

```
<span class="label label-default">Default Label</span>
```

2. Tailwind:
   a. Button:

```
<button class=" bg-blue-800
    hover:bg-green-600
    text-black
    font-italic
     py-2 px-4 rounded "> Button
</button>
```

Here we can see Tailwind is providing interesting customization without even touching stylesheet. These states like hovering and focusing using classes were never part of bootstrap.

   b. Grid:

```
<div class="grid  grid-cols-3  gap-4  bg-blue-400">
  <div> 1 </div>
  <div> 2 </div>
  <div> 3 </div>
  <div> 4 </div>
  <div> 5 </div>
  <div> 6 </div>
```

```
</div>
```

c. Simple label:

```
<span class="text-xs font-semibold inline-block py-1 px-2 uppercase rounded text-pink-600 bg-pink-200 uppercase last:mr-0 mr-1">
  pink
</span>
```

Conclusion:

we can conclude that if we are working as a new backend developer or a “Full-Stack” developer, we should opt for Bootstrap first. Whereas if we are working as front-end developer, then Tailwind CSS is the better option for the custom designs.