

## Internet Technologies Assignment

Ans 1. It is important to combine mobile and web applications to ensure they work seamlessly on both platforms involving adopting responsive web design and potentially utilizing hybrid app development.

- Responsive Web Design - Implement responsive styles using CSS media queries. These queries allow you to apply different styles based on the characteristics of device. Fluid grids also allow to adapt to different screen size.
- Mobile-optimized layouts - Design layouts optimized for various screen sizes rearrange elements / prioritize content based on available dimensions of the screen.
- Hybrid App Development - Frameworks like React Native, Flutter and Xamarin allow building cross-platform mobile apps with a single codebase.
- Progressive Web Apps - PWAs can work offline and low network conditions and help to provide app-like experience with features like push notifications and home-screen installment.
- APIs and Backend Integration - They develop a unified set of APIs that both web and mobile applications can consume and utilize BaaS solutions for unified backend.
- User Authentication and Data Sync - Single sign on allows user to sign in across both web and app platforms. They also sync data, app states and preferences.
- Cross-Browser and Cross-Platform Testing - Lastly, a testing is required to understand user experience and make personalized changes if needed for the platforms.

Ans 2

The easiest way to read a file in Node.js is to use the `fs.readFile()` method, passing it the file path, encoding and a callback function that will be called with the file data and the error.

Ex:

```
const fs = require('node:fs');
fs.readFile('/users/xyz/test.txt', 'utf8', (err, data) => {
  if (err) {
    console.error(err);
    return;
  }
  console.log(data);
})
```

Alternatively, we can use the synchronous version for reading files, that is, `fs.readFileSync()`

Ex:

```
const fs = require('node:fs');
try {
  const data = fs.readFileSync('/users/xyz/test.txt',
    'utf8');
  console.log(data);
} catch (err) {
  console.error(err);
}
```

You may also use promise-based `fsPromises.readFile()` method using `fs/promises` module:

Ex:

```
const fs = require('node:fs/promises');
```

```
async function example() {
```

```

try {
    const data = await fs.readFile('/users/xyz/test.txt',
        { encoding: 'utf8' });
    console.log(data);
} catch (err) {
    console.log(err);
}
example();

```

Ans 3

A search engine is a software program that extracts information from the web pages available on the internet according to the user query.

### Components of Search Engine:

- Web crawler - A search engine uses <sup>many</sup> web crawlers to crawl across world wide web and gather information.
- Database - The information gathered by web crawler is stored in a database.
- Indexer - The indexer provides analysis of the text, metadata and information gathered and then it creates an organized index/database for the information.
- Query Processor - The query processor receives user information and determines which pages are most relevant in the index according to the user query.
- Ranking algorithm - It determines the order in which search results should be presented based on the key word and other factors deemed important according to the coding of the algorithm.
- User interface - User interface is the platform where user can search for the information.

## How Does Search Engine work?

1. The web crawler begins by visiting a set of seed URLs and then follows links on these pages to discover new URLs. It continues crawling through the web, discovering and indexing new pages.
2. The indexer processes the content gathered by the crawler and creates an organized index of words and their locations on different pages. The index serves as a reference for responding to user queries.
3. When a user enters a search query, the query processor analyses the query terms and searches for the index with the term.
4. The ranking algorithm assigns scores to relevant pages based on factors according to code like relevance, page authority, user engagement, etc.
5. The search engine's user interface displays the ranked results.

Ans 4

Blogs

Forums

→ Blogs are usually one-way communication medium where an individual shares their thoughts, ideas on topics of their choice. → Forums are meant for multi-way communication. They provide users a platform to hold discussions on various topics.

→ The authors of blogs are usually individuals or a group of individuals who create and publish content. → Forums have distributed authorship. An initial post has replies by several other forum members, thus multiple contributors.

Teacher's Sign .....

- The content of blogs is usually in-depth knowledge / insight on specific topics or personal experiences or content sharing.
- Forums have diverse content because of user-focused discussions which may be questions, opinions or thoughts.
- Bloggers have control over the content as well as comments over the blog.
- Forum users do not have this control. Their posts are overseen by moderators.
- Blogs, typically, appear in a latest to oldest chronological order.
- Forums are organized by topics and threads rather than time.

### Ans 5

A cookie is an item of data that a web server saves to your computer's hard disk via a web browser. It can contain almost any alphanumeric information (under 4 KB) and can be retrieved from your computer and returned to the server.

A session is a mechanism that allows to maintain certain information about user interaction with a website across multiple requests and responses.

Cookies and sessions improved user experience by:

→ Tracking - Information such as how many times a webpage is visited, how long time was spent on it, user activity on particular sites is tracked in order to personalize according to user preferences.

→ User Identification - Within a session or for a particular time in case of cookies, the users are identified and recognized to take care of user information, authentication and staying logged in across visits.

→ Maintaining sessions - Cookies link the user to a specific session on server and allows user's interaction with the site to be stored for awhile.

Ans 6

JavaScript Object Notation (JSON) is basically a text format that makes it easy to share data between devices such as clients and servers. JSON is text-based format and consists of key-value pairs.

Major differences between JSON and JavaScript object are:-

→ Syntax: JSON object's key must be a string written within double quotes while in JavaScript a key can be string, numbers or identifier names and the strings may be in single/double quotes.

→ Data Types: While JavaScript objects can accept functions and other JavaScript-specific datatypes, JSON has limited datatypes: string, number, object, array, boolean, null.

Example of JSON object:

{

```
"Name": "John Doe",
"Age": "20",
"Grades": [90, 20, 80],
"Address": {
    "Street": "123 XYZ",
    "ZipCode": "111183"
}
```

}

Ans 7

```

<html>
  <head>
    <title> Ques7 </title>
  </head>
  <body>
    <input type = "text" id = "1">
    <button onclick = "add TextBox()"> Add TextBox </button>

    <script>
      function add TextBox(){
        var n = document.createElement("input");
        n.type = "text";
        document.getElementById("1").appendChild(n);
      }
    </script>
  </body>
</html>

```

Ans 8

To use Jquery in our code, we first need to include the Jquery library in HTML file. This can be done by including the Jquery script from CDN (Content Delivery Network) or by downloading the Jquery library and hosting it locally.

Adding CDN:

```

<html>
  <head> <title> Jquery </title>
    <script src = "https://code.jquery.com/jquery-3.6.4.min.js">
    </script>
  </head>

```

```

<body>
  <p>Hello!</p>
  <script>
    $(p).css('background-color', 'blue');
  </script>
</body>
</html>

```

## Attribute Manipulation using Jquery methods

- ① : attr() - Used to get or set value of attributes for selected elements.

```


<script>
  var src1 = $("#1").attr("src");
  console.log("Image source:", src1);
</script>

```

- ② .removeAttr() - used to remove an attribute from the selected elements.

```

<div id="2" data-info="xyz"> Content </div>
<script>
  $("#2").removeAttr("data-info");
</script>

```

- ③ .addClass() - used to add new value to the existing value of the class attribute

```

<p id="3"> Hi! </p>
<script>

```

```
$("#3").addClass("highlight");
</script>
```

- ④ removeClass() - used to remove a value from the class attribute, leaving any other class names within that attribute intact.

```
<p id="4" class="highlight"> hi! </p>
<script>
```

```
$("#4").removeClass("highlight");
</script>
```

Ans 9

JQuery methods for DOM Traversal:

For DOM traversal, each method finds elements that have a different relationship to those in current selection.

The methods that require CSS-style selector as argument are:

- .find() - finds all elements within the current selection that match selector.
- .closest() - finds nearest ancestor that matches selector.

In "rest" methods, CSS-style selector is optional. But if selector is present both the method and selector must match in order for element to be added to selection.

- .parent() - finds direct parent of current selection
- .parents() - finds all parents of current selection
- .children() - finds all children of current selection
- .siblings() - finds all siblings of current selection
- .next() - finds next sibling of current element
- .nextAll() - finds all subsequent siblings of current element

Topic..... Date.....

- · prev() - finds previous siblings of current element
- · prevAll() - finds all previous siblings of current element.