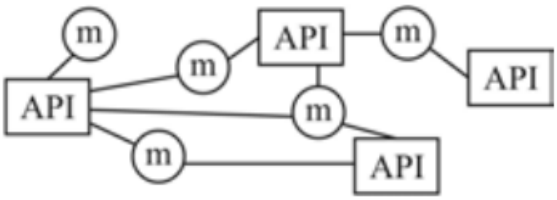
Q1. Explain the AJAX Web application model.

Ans. The AJAX application eradicates the start-stop-start-stop nature or the click, wait, and refresh criteria of the client-server interaction. Instead of loading the Web page during the beginning of the session, the browser loads the ASP engine written in JavaScript. The Web page sends its requests using a JavaScript function. This JavaScript code makes a request to the server. The server response comprises data and not the presentation, which implies that the data required by the page is provided by the server as the response and the style or presentation is implemented on that data with the help of the markup language. Most of the page does not change. Only parts of the page that need to change are updated. The JavaScript dynamically updates the Web page without redrawing everything. For the Web server, nothing has changed; it still responds to each request, just as it did before.

Q2. Define and describe mashups. What are the primary reasons for the success of mashups?

Ans. Mashups are based on the principle of using others' work to build on and thrive our own applications, and this principle is getting noticed worldwide, especially on the Internet. Mashups are expected to grow more in the times to come. The mashup ecosystem can be displayed as an interconnection of mashups (represented by m) and APIs, as shown in the following figure:



The reasons for astounding success of mashup ecosystems are:

- End users are activated as designers/developers
- Popular APIs, including Google Maps, Twitter, YouTube, etc., attract users
- Simplicity of copying helps everyone in reusing existing resources

Q3. List the usage of JavaScript.

Ans. The uses of JavaScript are as follows:

- JavaScript is simpler, so anyone can put the small snippets of the code into their HTML pages.
- JavaScript enables writing of dynamic text into HTML page. The variable text can also be written in HTML page; example

document.write("<h1>" +name + "</h1>").

This command will write the text of the name variable into the HTML page.

- JavaScript enables you to read and change the content of HTML controls.

For example, the text inserted in the text field of an HTML page can be read with the help of JavaScript.

- Certain validations to be performed on the client side, such as not leaving any text field blank, match of the password, and the confirmation of password fields, can be checked at client side by using JavaScript as the scripting language.

- JavaScript is also helpful in creating cookies. It can be used to either store or retrieve relevant information on the client's computer.
- JavaScript also enables you to load a specific page depending upon the client's request.
- JavaScript is used to write functions that are embedded in or included from HTML pages and interact with the Document Object Model (DOM) of the page.
- JavaScript is also helpful in changing the image as the mouse cursor moves over them.
- JavaScript is also helpful in calling the new Web page according to the client or user's action

Q4. List the levels of DOM.

Ans. The levels of DOM are as follows:

Level 0: The application supports an intermediate DOM, which existed before the creation of DOM Level 1. Examples include the DHTML object model or the Netscape intermediate DOM. Level 0 is not a formal specification published by the W3C, but rather a shorthand that refers to what existed before the standardization process.

Level 1: It includes the navigation of DOM (HTML and XML) document (tree structure) and content manipulation (includes adding elements). HTML-specific elements are included as well.

Level 2: XML namespace supports filtered views and events.

Level 3: This level consists of the following six different specifications:

1. DOM Level 3 Core
2. DOM Level 3 Load and Save
3. DOM Level 3 XPath
4. DOM Level 3 Views and Formatting
5. DOM Level 3 Requirements
6. DOM Level 3 Validation, which further enhances the DOM

Q5. List the conditional statements used in JavaScript.

Ans. The conditional statements used in JavaScript are as follows:

1. if statement
2. if-else statement
3. switch statement
4. while loop
5. do-while loop for loop

Q6. Define CGI.

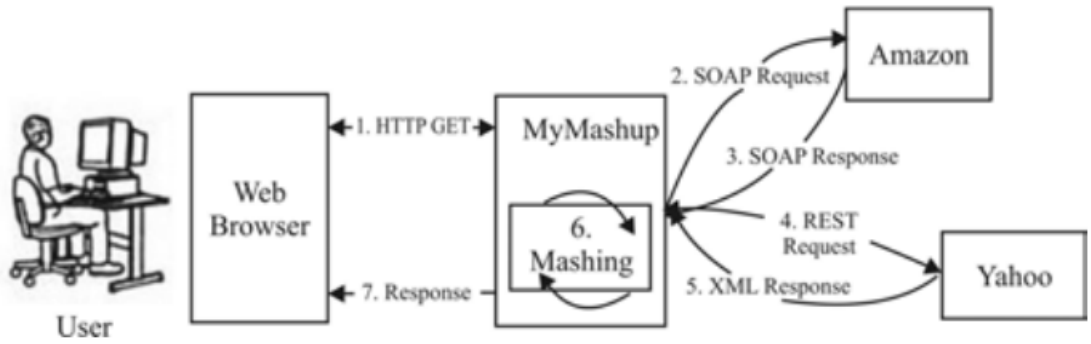
Ans. Common Gateway Interface (CGI) is a standard protocol for interfacing the external application software with an information server, commonly known as Web server. CGI is not a programming language; rather, it is a protocol that defines a set of rules on how the Web server communicates with the program. This functionality allows the server to pass the request from the client Web browser to the external application. In fact, CGI is a specification used to transfer information between the Web server and the CGI program. A CGI program is written in any programming language, like C, Perl, and Java.

Q7. Explain the relationship of JavaScript and AJAX.

Ans. JavaScript is an essential part of AJAX. The JavaScript code in an AJAX application sends the requests of the client to be processed by the server, but doesn't wait for an answer. Even better, JavaScript can also work with the server's response that comes in the form of XML instead of reloading the entire page when the server is finished with your request. In this case, the JavaScript processes the XML document according to DOM model.

Q8. Describe the Web-server mashup architecture.

Ans. The typical Web-server mashup architecture is shown in the following figure:



The architecture of Web-server mashups works in the following steps:

1. The Web browser uses HTTP or HTTPs to send request for a page to the server.

2. The Web server constructs the page by connecting to the source or partner sites, which include Google, Amazon, Yahoo, etc. In our example, Amazon gets the first request from the browser using SOAP over HTTP.

3. The Web server gets the SOAP response back from Amazon.

4. Our example has the second request being sent to Yahoo through REST.

5. The Web server receives Plain Old XML over HTTP from Yahoo.

6. The Web server, now, combines and rationalizes the data in the most suitable manner and sends the response back.

7. The data resulting from the Web server is combined in an HTML format and the response is sent back to the browser.

Q 9. What are the characteristics of REST WSs?

Ans. WSs based on REST architecture encapsulate a lot of functionality. The characteristics of REST are as follows: Pull-based interaction between the client and server means that the client actively requests changes on the server side, based on some time interval. The client will not automatically get recent changes about some activity continuously changing on the server side. In this interaction, the user interface matters are kept separate from the data storage matters, thereby enhancing portability across various platforms Stateless nature means that every request from a client to a server has information required to understand the request, and the session state is maintained on the client side. Responses should be able to cache. The benefit of caching is that it removes the need for further interactions and results in greater efficiency and scalability. All

resources are accessed using uniform interface. Resources can be named using URL. Client state can be changed from one to another. REST system is divided into layers, and each layer cannot see the functionality of the other layers, except that of the adjacent layers. There are proxy servers between clients and resources for features like security. This existence of proxy permits increasing of client functionality by downloading and executing code in applets.

Q10 Differentiate between Angular and Node.js.

AngularJS is a Javascript open-source front-end framework that is mainly used to develop Single Page Applications(SPAs). It is a continuously growing and expanding framework which provides better ways for developing web applications. It changes the static HTML to dynamic HTML. It is an open-source project which can be freely used and changed by anyone. It extends HTML attributes with Directives, and data is bound with HTML.

Features of AngularJS:

It facilitates the Model View Controller that helps to connect the model and the view components that manage & responsible for rendering the application data.

It provides the concept of Data Binding which is a two-way process, i.e the view layer of the MVC architecture is an exact copy of the model layer, there is no need to write special code to bind data to the HTML controls.

It makes use of the templates, that are passed by the browser into DOM, then DOM becomes the input of the AngularJS compiler and then AngularJS traverses the DOM template for rendering instructions which are called directives.

It provides the routing concept that helps to navigate one page to another, without actually refreshing the page. For this, it helps to develop single-page web applications(SPAs).

Node.js is a cross-platform JavaScript runtime environment. It allows the creation of scalable Web servers without threading and networking tools using JavaScript and a collection of “modules” that handle various core functionalities. It can make console-based and web-based node.js applications.

Features of NodeJS:

It implements single-threaded architecture with event looping, making it very scalable. In contrast to typical servers, which create limited threads to process requests, the event mechanism allows the node.js server to reply in a non-blocking manner and makes it more scalable.

It provides the scalability that helps to develop scalable software. NodeJS can also handle concurrent requests efficiently. It has a cluster module that manages load balancing for all CPU cores that are active.

It facilitates the quick execution of the code by making use of the V8 JavaScript Runtime motor.

When data is transmitted in multiple streams, processing them takes a long time. Node.js processes data at a very fast rate. It processes and uploads a file simultaneously, thereby saving a lot of time.

Q11. Define any two features of MongoDB.

Q12 Explain the term indexing in MongoDB.

Features of MongoDB –

Schema-less Database: It is the great feature provided by the MongoDB. A Schema-less database means one collection can hold different types of documents in it. Or in other words, in the MongoDB database, a single collection can hold multiple documents and these documents may consist of the different numbers of fields, content, and size. It is not necessary that the one document is similar to another document like in the relational databases. Due to this cool feature, MongoDB provides great flexibility to databases.

Document Oriented: In MongoDB, all the data stored in the documents instead of tables like in RDBMS. In these documents, the data is stored in fields(key-value pair) instead of rows and columns which make the data much more flexible in comparison to RDBMS. And each document contains its unique object id.

Indexing: In MongoDB database, every field in the documents is indexed with primary and secondary indices this makes easier and takes less time to get or search data from the pool of the data. If the data is not indexed, then database search each document with the specified query which takes lots of time and not so efficient.

Scalability: MongoDB provides horizontal scalability with the help of sharding. Sharding means to distribute data on multiple servers, here a large amount of data is partitioned into data chunks using the shard key, and these data chunks are evenly distributed across shards that reside across many physical servers. It will also add new machines to a running database.

Replication: MongoDB provides high availability and redundancy with the help of replication, it creates multiple copies of the data and sends these copies to a different server so that if one server fails, then the data is retrieved from another server.

Aggregation: It allows to perform operations on the grouped data and get a single result or computed result. It is similar to the SQL GROUPBY clause. It provides three different aggregations i.e, aggregation pipeline, map-reduce function, and single-purpose aggregation methods

High Performance: The performance of MongoDB is very high and data persistence as compared to another database due to its features like scalability, indexing, replication, etc.