SRM VALLIAMMAI ENGEINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203.

(An Autonomous Institution)

DEPARTMENT OF COMPUTER APPLICATIONS

QUESTION BANK

II SEMESTER

MC4261 FULL-STACK WEB DEVELOPMENT

Regulation – 2024

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SUBJECT : MC4261-FULL-STACK WEB DEVELOPMENT
SEM / YEAR : II / I year MCA

UNIT I-INTRODUCTION TO CSS and JAVASCRIPT

Introduction to Web: Server - Client - Communication Protocol (HTTP) – Structure of HTML Documents – Basic Markup tags – Working with Text and Images with CSS– CSS Selectors – CSS Flexbox - JavaScript: Data Types and Variables - Functions - Events – AJAX: GET and POST

Q.No.	Question	Bloom's Taxonomy Level	Competence	Course Outcome
	PART – A			
1.	What is the role of client in web communication?	BTL -1	Remembering	CO 1
2	List the uses of HTTP protocol.	BTL -2	Understanding	CO 1
3	Distinguish between GET and POST methods in HTTP.	BTL -2	Understanding	CO 1
4	Define the term web server.	BTL -1	Remembering	CO 1
5	Expand the term URL.	BTL -2	Understanding	CO 1
6	What is the purpose of the <img> tag in HTML?	BTL -1	Remembering	CO 1
7.	Develop the structure of an HTML document.	BTL -2	Understanding	CO 1
8.	Define a CSS Flexbox.	BTL -1	Remembering	CO 1
.9	How do you link an external CSS file to an HTML document?	BTL -2	Understanding	CO 1
10	Write the role of the alt attribute in the <img> tag.	BTL -1	Remembering	CO 1
11	List the Data Types supported by JavaScript.	BTL -1	Remembering	CO 1
12	What does em do in HTML?	BTL -1	Remembering	CO 1
13	What does CSS stand for, and what is its role in web development?	BTL -2	Understanding	CO 1
14.	What is the difference between inline and block-level elements in HTML?	BTL -1	Remembering	CO 1
15.	Distinguish between an ID and a class selector in CSS.	BTL -2	Understanding	CO 1
16.	How do you center a div element using Flexbox?	BTL -2	Understanding	CO 1
17.	How do you declare a JavaScript variable?	BTL -2	Understanding	CO 1
18.	What is the difference between let and const in JavaScript?	BTL -1	Remembering	CO 1
19.	What is the purpose of the box-sizing property in CSS?	BTL -1	Remembering	CO 1
20.	What is the H1 to H6 tag?	BTL -1	Remembering	CO 1
21.	How can you declare a constant in JavaScript?	BTL -2	Understanding	CO 1
22.	How do you apply a CSS rule to an element using its class selector?	BTL -1	Remembering	CO 1
23.	Expand the term AJAX.	BTL -2	Understanding	CO 1
24.	What are events in JavaScript?	BTL -1	Remembering	CO 1
25.	In what way to create a JavaScript functions?	BTL -2	Understanding	CO 1
	PART – B			

1.	Explain the HTTP protocol, including its client-server model, and how communication takes place using GET and POST methods.	BTL -3	Applying	CO 1
2.	Discuss the structure of an HTML document. Explain the role of each section and their significance.	BTL -3	Applying	CO 1
3.	Describe the various HTML tags used to create hyperlinks, tables, and forms, with examples.	BTL -3	Applying	CO 1
4.	Explain how to work with text in HTML. Discuss the importance of tags like <h1>, <p>, and with examples.	BTL -3	Applying	CO 1
5.	Discuss how images are handled in HTML. Provide a detailed explanation of the <img> tag and its attributes.	BTL -4	Analyzing	CO 1
6.	Illustrate the different types of CSS with example code.	BTL5	Evaluating	CO 1
7.	Describe how to work with various CSS selectors with suitable example.	BTL -4	Analyzing	CO 1
8.	Analyze the concept of CSS Flexbox and how to create flexible layouts using it.	BTL -4	Analyzing	CO 1
9.	Discuss the main properties flex, justify-content, align-items of CSS Flexbox with suitable example.	BTL -3	Applying	CO 1
10.	Examine how to create a responsive layout using CSS Flexbox. Include examples of flex containers, flex items and different alignment strategies.	BTL -4	Analyzing	CO 1
11.	Describe the primitive data types in JavaScript and how they differ with coding examples.	BTL -3	Applying	CO 1
12.	Explain how JavaScript functions are declared, called and passed parameters along with examples.	BTL -3	Applying	CO 1
13.	Develop a detailed JavaScript code for mouse move event.	BTL6	Creating	CO 1
14.	Write a JavaScript code for Form validation of mandatory filed and display the message as “Input cannot be empty”.	BTL6	Creating	CO 1
15.	Explain the concept of asynchronous JavaScript, role of AJAX, get and post methods.	BTL -3	Applying	CO 1
16.	Explain how JavaScript interacts with the DOM. Discuss how to access, manipulate, and modify elements in the DOM using JavaScript.	BTL -4	Analyzing	CO 1
17.	(i) Write a JS code for Keyboard Event Handling Methods.(8) (ii) Write a JS code for Window Event Handling Methods.(8)	BTL6	Creating	CO 1
18.	(i) Develop a a basic web application using HTML and CSS. (10) (ii) Develop a a basic web application using Form Events.(6)	BTL6	Creating	CO 1

UNIT II SERVER-SIDE PROGRAMMING WITH NODE JS

Introduction to Web Servers – JavaScript in the Desktop with NodeJS – NPM – Serving files with the http module – Introduction to the Express framework – Server-side rendering with Templating Engines – Static Files - async/await - Fetching JSON from Express

Q.No.	Question	Bloom’s Taxonomy Level	Competence	Course Outcome
	PART – A			
1.	How does Node.js allow JavaScript to run on the desktop?	BTL-2	Understanding	CO 2
2.	Expand the term NPM.	BTL-2	Understanding	CO 2

3.	Distinguish between Express.js and Node.js.	BTL-2	Understanding	CO 2
4.	Define node package manager in the context of Node.js.	BTL-1	Remembering	CO 2
5.	Why templating engines used in web development?	BTL-2	Understanding	CO 2
6.	What is the purpose of the http module in Node.js?	BTL-1	Remembering	CO 2
7.	Give an example of a templating engine commonly used with Node.js.	BTL-1	Remembering	CO 2
8.	How to serve static files using the http module in Node.js?	BTL-2	Understanding	CO 2
9.	In what way to handle asynchronous operations in Node.js using callbacks?	BTL-2	Understanding	CO 2
10.	Distinguish between client-side and server-side rendering.	BTL-2	Understanding	CO 2
11.	Expand the term JWT.	BTL-2	Understanding	CO 2
12.	What server-side rendering is in web development?	BTL-1	Remembering	CO 2
13.	State the difference between synchronous and asynchronous programming in JavaScript.	BTL-2	Understanding	CO 2
14.	What is the role of static files in web development?	BTL-1	Remembering	CO 2
15.	How to improve asynchronous programming in JavaScript?	BTL-2	Understanding	CO 2
16.	Write the use of express.static() function.	BTL-1	Remembering	CO 2
17.	Infer the	BTL-2	Understanding	CO 2
18.	What is JSON?	BTL-1	Remembering	CO 2
19.	What is the purpose of the app.listen() function in Express?	BTL-1	Remembering	CO 2
20.	List the advantages of using Express.	BTL-1	Remembering	CO 2
21.	When would you use res.json() method in Express?	BTL-2	Understanding	CO 2
22.	State the role of a routing middleware in Express.js.	BTL-1	Remembering	CO 2
23.	What is async/await?	BTL-1	Remembering	CO 2
24.	Specify the main features of the Express framework.	BTL-1	Remembering	CO 2
25.	Infer how to integrate MongoDB with Express.js.	BTL-2	Understanding	CO 2
	PART –B			
1.	Compare the client-side and server-side applications.	BTL5	Evaluating	CO 2
2.	Describe how to set up and use Node.js with NPM to manage dependencies in a web project.	BTL -3	Applying	CO 2
3.	Explain the process of serving files using the http module in Node.js.	BTL -3	Applying	CO 2
4.	Discuss the Express framework and how it simplifies web server development in Node.js.	BTL -3	Applying	CO 2
5.	Discuss the benefits and challenges of using server-side rendering with templating engines in Node.js.	BTL-4	Analyzing	CO 2
6.	Discuss how you can use Express and a templating engine to serve dynamic content.	BTL-4	Analyzing	CO 2
7.	Explain how you can fetch JSON data from an API using the fetch function in JavaScript.	BTL-3	Applying	CO 2
8.	Discuss the NPM package management system in detail.	BTL-3	Applying	CO 2
9.	Discuss about the routing in Express, handle HTTP methods and create route parameters.	BTL -3	Applying	CO 2
10.	Discuss how to use middleware for error handling and send appropriate error messages to clients.	BTL-4	Analyzing	CO 2
11.	Illustrate the integration of databases with Express.js with suitable example.	BTL -3	Applying	CO 2
12.	Explain the following methods in Express: (8+8)	BTL -3	Applying	CO 2

	(i) res.send() (ii) res.json()			
13.	Discuss using middleware and session management, including JSON Web Tokens (JWT) for secure authentication.	BTL-3	Applying	CO 2
14.	Discuss how you would use the async/await syntax to fetch data from a remote API and render it dynamically in an Express application.	BTL-3	Applying	CO 2
15.	Explain how you can deploy a Node.js application with Express to a production.	BTL-4	Analyzing	CO 2
16.	Develop a Node.js program that reads the contents of a text file and writes the same content to another text file.	BTL6	Creating	CO 2
17.	Write a Node.js program using the Express.js framework to create a REST API that returns a JSON object when accessed at /data.	BTL6	Creating	CO 2
18.	(i) Write a Node.js program to create a basic HTTP server that listens on port 3000 and returns a "Hello World!" message when accessed via a browser or a tool like curl.(9) (ii) Write a express program to handle different HTTP methods (GET, POST) on different routes.(7)	BTL6	Creating	CO 2

UNIT – III ADVANCED NODE JS AND DATABASE Introduction to NoSQL databases – MongoDB system overview - Basic querying with MongoDB shell – Request body parsing in Express – NodeJS MongoDB connection – Adding and retrieving data to MongoDB from NodeJS – Handling SQL databases from NodeJS – Handling Cookies in NodeJS – Handling User Authentication with NodeJS.

Q.No.	Question	Bloom's Taxonomy Level	Competence	Course Outcome
	PART – A			
1.	Differentiate between SQL and NoSQL databases.	BTL-2	Understanding	CO 3
2.	How do you create a database in MongoDB?	BTL-2	Understanding	CO 3
3.	How do you connect a NodeJS application to MongoDB?	BTL-2	Understanding	CO 3
4.	Define NoSQL database.	BTL-1	Remembering	CO 3
5.	How would you update a document in MongoDB?	BTL-2	Understanding	CO 3
6.	List the advantages of using MongoDB over traditional relational databases.	BTL-1	Remembering	CO 3
7.	What is the role of the MongoDB shell in interacting with the database?	BTL-1	Remembering	CO 3
8.	Write the purpose of the find() method in MongoDB.	BTL-1	Remembering	CO 3
9.	How can you delete a document in MongoDB?	BTL-2	Understanding	CO 3
10.	What does the insertOne() method do in MongoDB?	BTL-1	Remembering	CO 3
11.	How does MongoDB support indexing?	BTL-2	Understanding	CO 3
12.	State the purpose of the aggregate() method in MongoDB.	BTL-1	Remembering	CO 3
13.	How are cookies managed in NodeJS?	BTL-2	Understanding	CO 3
14.	Mention the common operators used in MongoDB queries.	BTL-1	Remembering	CO 3
15.	How does user authentication work in a NodeJS application	BTL-2	Understanding	CO 3
16.	What is the significance of cookies in web development?	BTL-1	Remembering	CO 3

17.	Define Cookies.	BTL-1	Remembering	CO 3
18.	Specify the way of securely store passwords in a NodeJS application.	BTL-2	Understanding	CO 3
19.	How can you send and receive them in a Node.js application?	BTL-1	Remembering	CO 3
20.	How do you handle request bodies in Express?	BTL-2	Understanding	CO 3
21.	What is the role of body-parser in an Express application?	BTL-1	Remembering	CO 3
22.	Infer the purpose of the mysql package in NodeJS	BTL-2	Understanding	CO 3
23.	How to switch database in mongoose?	BTL-1	Remembering	CO 3
24.	Name the command to display all databases in MongoDB.	BTL-1	Remembering	CO 3
25.	Why do use Mongoose?	BTL-2	Understanding	CO 3
	PART –B			
1.	Explain the architecture and components of MongoDB. How does MongoDB handle data storage and retrieval	BTL-3	Applying	CO 3
2.	Discuss the MongoDB aggregate() method with anexample.	BTL-3	Applying	CO 3
3.	Describe the process of inserting data into MongoDB with example.	BTL-3	Applying	CO 3
4.	Explain how to delete data from MongoDB with example code.	BTL-3	Applying	CO 3
5.	Discuss how request body parsing works in Express.	BTL-4	Analyzing	CO 3
6.	Explain how to create and manage routes in an Express application.	BTL-3	Applying	CO 3
7.	(i)Describe how to connect NodeJS with a SQL database (MySQL). (6) (ii) Discuss the process of creating, reading, updating, and deleting records. (10)	BTL-3	Applying	CO 3
8.	Discuss how to handle user authentication in a NodeJS application using sessions.	BTL-4	Analyzing	CO 3
9.	(i) Explain the role of middleware in an Express application.(6) (ii)How to use middleware for tasks like logging, authentication and error handling. (10)	BTL-3	Applying	CO 3
10.	How can you manage environment variables in NodeJS applications? Discuss the use of the dotenv package.	BTL-3	Applying	CO 3
11.	Explain the process of handling file uploads in NodeJS using Express.	BTL-3	Applying	CO 3
12.	Execute the method to remove a single document or multiple documents from a MongoDB collection using Node.js.	BTL-3	Applying	CO 3
13.	Discuss how to create and use APIs in a NodeJS application.	BTL-3	Applying	CO 3
14.	Implement a NodeJS Express application where users can register and log in and the session information is stored in a MongoDB database.	BTL6	Creating	CO 3
15.	Create a NodeJS application with Express to handle password reset functionality using an email link.	BTL6	Creating	CO 3
16.	Explain and develop a MongoDB shell query for the following:	BTL6	Creating	CO 3

	(i) To find all documents in the users collection where the age is greater than 25. (8) (ii) To update the email field of the user with the name "Bob" to "bob@example.com" in the users collection. (8)			
17.	Write and explain a MongoDB shell query for the following: (i) To insert a new document into a collection called users with the following fields: name, email, and age. (8) (ii) Add a new field address to all documents in the users collection. (8)	BTL6	Creating	CO 3
18.	(ii) Write and explain a MongoDB shell query to find users in the users collection whose name contains the string "Jo". (8) (ii) Write and explain a MongoDB shell query to find users in the users collection who have a name that contains at least one space. (8)	BTL6	Creating	CO 3

UNIT – IV ADVANCED CLIENT-SIDE PROGRAMMING

React JS: ReactDOM - JSX - Components - Properties – Fetch API - State and Lifecycle -JS Local storage - Events - Lifting State Up - Composition and Inheritance

Q.No.	Question	Bloom's Taxonomy Level	Competence	Course Outcome
	PART – A			
1.	What is ReactDOM in React JS?	BTL-1	Remembering	CO 4
2.	What is JSX in React JS?	BTL-1	Remembering	CO 4
3.	Differentiate between JSX and HTML.	BTL-1	Remembering	CO 4
4.	What is React JS?	BTL-1	Remembering	CO 4
5.	What are components in React JS?	BTL-1	Remembering	CO 4
6.	What is a class component in React JS?	BTL-1	Remembering	CO 4
7.	What is state in React JS?	BTL-1	Remembering	CO 4
8.	Mention the function of the render() method in React.	BTL-2	Understanding	CO 4
9.	Infer the functional component in React JS.	BTL-2	Understanding	CO 4
10.	Infer the purpose of props in React.	BTL-2	Understanding	CO 4
11.	What is the useState hook in React?	BTL-1	Remembering	CO 4
12.	How can you pass data between components in React?	BTL-2	Understanding	CO 4
13.	How do you handle events in React?	BTL-2	Understanding	CO 4
14.	How do you make a GET request using the Fetch API in React?	BTL-2	Understanding	CO 4
15.	Distinguish between props and state.	BTL-2	Understanding	CO 4
16.	What are synthetic events in React?	BTL-1	Remembering	CO 4
17.	What is the Fetch API used for in React JS?	BTL-1	Remembering	CO 4
18.	What are lifecycle methods in React?	BTL-1	Remembering	CO 4
19.	How do you use local storage in React?	BTL-2	Understanding	CO 4
20.	How do you retrieve data from localStorage in React?	BTL-2	Understanding	CO 4
21.	What is lifting state up in React?	BTL-1	Remembering	CO 4
22.	Differentiate between component inheritance and component composition in React.	BTL-2	Understanding	CO 4
23.	What is the role of keys in React lists?	BTL1	Remembering	CO 4
24.	What are controlled components in React?	BTL2	Understanding	CO 4

25.	How do you update the state of a component in React?	BTL2	Understanding	CO 4
	PART –B			
1.	(i)Explain the architecture of a React application.(10) (ii)How React interacts with the DOM?.(6)	BTL3	Applying	CO 4
2.	Compare Functional vs Class Components in React.	BTL5	Evaluating	CO 4
3.	(i) Explain the concept of JSX in React with example. (10) (ii) How is JSX different from HTML? (6)	BTL4	Analyzing	CO 4
4.	Discuss how React uses props to pass data between components. Give an example of passing data from parent to child component.	BTL4	Analyzing	CO 4
5.	Explain the difference between state and props with examples.	BTL4	Analyzing	CO 4
6.	Explain React's component lifecycle methods. Provide an example of using componentDidMount() and componentWillUnmount().	BTL3	Applying	CO 4
7.	Describe the use of the useState hook. Provide an example of how state can be modified using this hook.	BTL3	Applying	CO 4
8.	Explain the useEffect hook. How is it used to manage side effects in functional components?	BTL3	Applying	CO 4
9.	How can you handle events in React? Provide examples of common events like onClick, onChange, and onSubmit.	BTL4	Analyzing	CO 4
10.	What is the Fetch API in React? Discuss how do you use it to fetch data from an external API with an example.	BTL3	Applying	CO 4
11.	Illustrate with an example of using localStorage.setItem() and localStorage.getItem().	BTL4	Analyzing	CO 4
12.	What is the significance of keys in React lists? Explain why keys are important for optimizing performance in dynamic lists.	BTL3	Applying	CO 4
13.	Evaluate the concept of controlled components and uncontrolled components in React.	BTL5	Evaluating	CO 4
14.	Discuss how controlled components are used to handle form inputs and submission.	BTL4	Analyzing	CO 4
15.	Examine how you can implement conditional rendering in React. Provide examples using both if-else statements and ternary operators.	BTL4	Analyzing	CO 4
16.	Develop the code for the following : Create a Vehicle class with a method move(). Then create a Car class that inherits from Vehicle. The Car class should have a method drive() that overrides the move() method to print "Car is moving".	BTL6	Creating	CO 4
17.	Implement the following: Create a base class Shape with a method area(). Then create two derived classes Circle and Rectangle. The Circle class should calculate the area of a circle, and the Rectangle class should calculate the area of a rectangle.	BTL6	Creating	CO 4
18.	Implement a Composition Library class, which contains a list of Book objects. Each Book should have a title and an author. The Library should be able to print all books.	BTL6	Creating	CO 4

UNIT – V APP IMPLEMENTATION IN CLOUD Cloud providers Overview – Virtual Private Cloud – Scaling (Horizontal and Vertical) – Virtual Machines, Ethernet and Switches – Docker Container – Kubernetes.				
Q.No.	**Question**	**Bloom's Taxonomy Level**	**Competence**	**Course Outcome**
	PART – A			
1.	What is a Cloud Service Model?	BTL-1	Remembering	CO 5
2.	Name the three main types of Cloud Service Model.	BTL-1	Remembering	CO 5
3.	Differentiate between Public Cloud and Private Cloud.	BTL-2	Understanding	CO 5
4.	Define the term "Virtual Private Cloud"	BTL-1	Remembering	CO 5
5.	What is horizontal scaling in cloud computing?	BTL-1	Remembering	CO 5
6.	Define vertical scaling in the context of cloud computing.	BTL-2	Understanding	CO 5
7.	What is the role of a virtual machine in a cloud environment?	BTL-1	Remembering	CO 5
8.	What is the significance of an Ethernet switch in a cloud network?	BTL-2	Understanding	CO 5
9.	How do Virtual Machines differ from containers in cloud environments?	BTL-2	Understanding	CO 5
10.	How docker assist in cloud computing?	BTL-2	Understanding	CO 5
11.	List the basic function of a container in cloud infrastructure.	BTL-1	Remembering	CO 5
12.	What is Kubernetes?	BTL-1	Remembering	CO 5
13.	What is meant by "cloud scalability"?	BTL-1	Remembering	CO 5
14.	Mention the advantages of using Docker over traditional virtual machines.	BTL-2	Understanding	CO 5
15.	What is load balancing in cloud computing?	BTL-1	Remembering	CO 5
16.	Differentiate between cloud storage and on-premises storage.	BTL-2	Understanding	CO 5
17.	What is an instance in cloud computing?	BTL-1	Remembering	CO 5
18.	Infer the concept of serverless computing in the cloud.	BTL-2	Understanding	CO 5
19.	State the role of API gateways in cloud-based applications.	BTL-2	Understanding	CO 5
20.	How does Kubernetes handle load balancing within clusters?	BTL-2	Understanding	CO 5
21.	Infer the security concerns in cloud computing.	BTL-2	Understanding	CO 5
22.	What are the main differences between a VPC and VLAN?	BTL-2	Understanding	CO 5
23.	How does Kubernetes manage containerized applications?	BTL-1	Remembering	CO 5
24.	What is Docker?	BTL-2	Understanding	CO 5
25.	Infer the concept of virtualization in cloud computing.	BTL-1	Remembering	CO 5
	PART –B			
1.	Explain the architecture and working of a Virtual Private Cloud (VPC) in a cloud computing environment. Discuss its components and how they interact.	BTL-3	Applying	CO 5
2.	Compare and contrast horizontal scaling and vertical scaling in cloud computing.	BTL5	Evaluating	CO 5
3.	Explain the role of hypervisors and how virtualization impacts the provisioning of resources.	BTL-3	Applying	CO 5
4.	(i)Describe the differences between Docker containers and Virtual Machines (12). (ii)What are the advantages of using Docker in cloud environments? (4)	BTL-4	Analyzing	CO 5

5.	(i) Explain Kubernetes in detail.(7) (ii)Discuss its architecture, components, and how it manages the lifecycle of containerized applications. (9)	BTL-4	Analyzing	CO 5
6.	Discuss how cloud computing enables the deployment of scalable applications. Focus on both horizontal and vertical scaling techniques.	BTL-4	Analyzing	CO 5
7.	Describe the benefits of using cloud computing for hosting web applications.	BTL-4	Analyzing	CO 5
8.	Explain the concept of container orchestration. How does Kubernetes facilitate orchestration, and what problems does it solve?	BTL-3	Applying	CO 5
9.	(i) Discuss the concept of networking in cloud environments. (7) (ii) Describe the roles of Ethernet switches and routers in a cloud infrastructure. (9)	BTL-3	Applying	CO 5
10.	Explain the principles behind load balancing in cloud computing. Discuss various load balancing algorithms and their impact on cloud-based application performance.	BTL-3	Applying	CO 5
11.	Describe the security measures that should be taken when deploying applications in the cloud.	BTL-3	Applying	CO 5
12.	Discuss how cloud providers ensure high availability and fault tolerance in their services.	BTL-4	Analyzing	CO 5
13.	(i) Describe the concept of a microservices architecture. (8) (ii) How does it work in cloud computing and what are the advantages? (8)	BTL-3	Applying	CO 5
14.	Explain the concept of serverless computing in cloud environments. How does it work and what are the advantages and challenges of using serverless architectures?	BTL-4	Analyzing	CO 5
15.	Discuss the role of API Gateways in cloud-native applications. How do they contribute to application management and scalability?	BTL-3	Applying	CO 5
16.	Discuss the differences between Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Give examples of each type of service.	BTL-4	Analyzing	CO 5
17.	Discuss the concept of multi-cloud and hybrid cloud environments. Explain how they differ and the advantages of using a combination of multiple cloud providers.	BTL-3	Applying	CO 5
18.	Create and Deploy a virtual machine using a virtual box that can be accessed from the host computer using SSH.	BTL6	Creating	CO 5

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