Đề 11/8 của coursera

1. Which architectural approach is characterised by a single, self-contained application?

Microservices

Monolith

Service-Oriented Architecture (SOA)

Hybrid Architecture

2. Lisa is tasked with scaling a Dockerized microservices application. She wants to ensure high availability and load balancing. Which Docker feature should she use for

this purpose?

Docker Compose

Docker Swarm

Docker Hub

Docker Registry

3. In Node.js, which keyword is used to import modules from external files?

import

require

include

use

4. What is the main purpose of the SQL INSERT statement?

To update existing records

To delete records from a table

To insert new records into a table

To sort the table data

5. What is the primary purpose of the 'kubectl' command-line tool in Kubernetes?

Creating container images

Managing and deploying Kubernetes objects

Monitoring container nerformance

Configuring network policies

6. Sophia is leading a high-profile open-source project on GitHub with contributors from around the world. The project involves sensitive code and data. What advanced

security strategies should Sophia implement to maintain the project's integrity and protect sensitive information?

Make the repository public for greater visibility and trust contributors to self-moderate.

Implement code signing for all contributions, use automated vulnerability scanning, and enforce strict access controls.

Rely solely on community policing for code review and security, avoiding direct involvement.

Share sensitive data openly in the repository and trust contributors to protect it.

7. In CSS, what is the "z-index" property used for?

Animating elements with a zoom effect

Defining the size and dimensions of elements

Controlling the stacking order of elements in a web page, determining which elements appear in front of others

Setting the background colour of elements

8. You are working on a microservices-based application with multiple backend services. How can an API Gateway enhance the architecture and implement features like

OAuth2 authentication, rate limiting, and request/response transformation to improve security and performance .?

By directly exposing all backend services to external clients

By simplifying client interactions and providing a single entry point to the microservices

By avoiding the use of microservices altogether

By increasing the complexity of the application

9.Alex is working on a high-performance database project and needs to improve query performance by creating an index on a specific column. Which SQL statement

should he use to create an index?

CREATE INDEX idx_name ON table_name(column_name)

ALTER TABLE table_name ADD INDEX (column_name)

ADD INDEX idx_name ON table_name(column_name)

INDEX CREATE idx name ON table name(column name)

10. Which microservices pattern is suitable when you need to ensure that a single instance of a service is running at all times and can be moved to another server if

needed?

API Gateway Pattern

Service Registry Pattern

Singleton Pattern

Circuit Breaker Pattern

11. Which software is commonly used to write and edit HTML code?

Word processing software

Web browsers

Integrated development environments (IDEs)

Graphic design software

12. Which cloud security model allows organisations to centralise security management, policies, and controls across multiple cloud providers?

CASB

IaaS

CCM

CSPM

13. What is the primary purpose of a GitHub pull request (PR) in a collaborative development workflow?

To delete a branch from the repository

To propose and discuss changes before merging them into the main branch

To merge changes automatically without review

To revert committed changes in the repository

14. What is a key consideration for cloud computing security?

Ignoring security altogether

Shared responsibility model

Using outdated hardware

Keeping all data on-premises

15. You are reviewing a Python codebase and discover that it lacks docstrings for functions and classes. Which Python coding practice does this omission violate and how

does it affect code quality?

Neglecting code comments makes it harder for developers to understand the code's purpose.

The omission of code comments improves code readability by removing distractions.

Lacking code comments simplifies code review and collaboration.

Omitting code comments reduces code complexity and improves performance.

16. Your organisation is deploying sensitive workloads in Docker containers and wants to ensure that container secrets are kept secure. Which Docker feature can you use

to manage and protect secrets within containers?

Docker Secrets Manager

Docker Compose

Docker Security Scanning

Docker Hub

17. In Docker, what is the primary role of the Docker Daemon (dockerd)?

Building container images

Running containerised applications

Managing container clusters

Orchestrating container deployments

18. You must update the 'price' column of all 'products' with a 'category' of 'Electronics' to set the price to $500. Which SQL statement should you use?

UPDATE products SET price = 500 WHERE category ='Electronics';

ALTER TABLE products SET price = 500 WHERE category = 'Electronics';

MODIFY products SET price = 500 WHERE category= 'Electronics';

UPDATE products FROM category = 'Electronics' SET price =500;

19. Olivia is developing a Django application that involves modelling complex relationships between users, groups, and permissions. What advanced Django ORM feature

should she use to define and manage these relationships effectively, considering scalability and maintainability?

Complex recursive relationships

Custom SQL queries for relationship management

Django's 'ManyToManyField' for handling many-to-many relationships

Using raw SQL for complex relationship queries

20. What is the primary goal of unit testing in Python development?

Testing the entire application's functionality

Identifying and fixing bugs in the code

Optimising the code for better performance

Creating user interfaces for the application

21. James is working on an enterprise-level React application with complex state management requirements. Which statement accurately describes why he might prefer

Redux over the React Context API for state management?

Redux offers simpler integration with React components compared to the React Context API.

Redux provides a more efficient solution for managing deeply nested state and handling complex updates.

Redux is a built-in part of the React framework, ensuring seamless state management.

Redux is known for its superior performance and faster rendering compared to the React Context API.

22. Alex is optimising the loading speed of a complex web application. What are the techniques and strategies he can employ to achieve this, considering both client-side

and server-side optimisations?

Optimising client-side rendering

Leveraging browser caching

Implementing lazy loading for assets

Using server-side rendering and content delivery networks (CDNs)

23. What is the primary benefit of using React Hooks for state management in functional components?

React Hooks simplify the creation of class components.

React Hooks allow functional components to manage state and side effects without the need for class components.

React Hooks provide enhanced styling capabilities for components.

React Hooks enables functional components to define complex props.

26. What is a primary advantage of using a public cloud service for hosting web applications compared to traditional on-premises hosting?

Increased hardware ownership

Reduced upfront infrastructure costs

Extended data center control

Complex software licencing

27. How does the 'abort' function in Flask contribute to error handling and the overall robustness of a web application?

By terminating the entire application in case of an error

By logging error messages to a file for analysis

By raising an HTTP error with a specific status code and optional description

By triggering a system-level exception when an error occurs

28. What is the primary purpose of using the CSS "position" property in web development?

To set the font size for text elements.

To control the placement and layout of HTML elements within a web page.

To specify the color of text and backgrounds.

To define the width and height of images.

29. Which is a step involved in creating REST APIs?

Writing HTML code for user interfaces

Designing database schemas

Defining API endpoints and HTTP methods

Installing operating systems

30. What is the primary purpose of containerisation?

Isolating applications from the host system

Optimising CPU usage

Running multiple containers on the same port

Managing server hardware

31.

You are designing a RESTful API for a financial application that deals with sensitive customer data. What security measures should you consider when designing the

authentication system for this API?

Use HTTP Basic Authentication with SSL/TLS for all requests.

Implement OAuth 2.0 with JWT (JSON Web Tokens) for secure authentication and authorisation.

Use a custom authentication mechanism with a shared secret key for all clients.

No authentication is needed since SSL/TLS provides sufficient security

32. Winston is planning to implement serverless architecture for the back end of a web application. What are the key considerations he should take into account when

designing a serverless infrastructure, including scalability, data storage, and event triggers.

Winston should focus on using serverless functions without considering scalability, as serverless inherently handles scalability effortlessly.

Scalability is a critical factor for serverless. Winston should ensure that the architecture can seamlessly handle varying loads. He should also evaluate and

choose a suitable data storage solution and configure event triggers for serverless functions.

Winston should rely on traditional monolithic databases for data storage as serverless architecture is primarily about function execution, not data management.

Event triggers are irrelevant in serverless architecture. Winston should focus solely on function deployment and execution.

33. What is the primary goal of Emotion Detection based on text input in Al applications?

Identifying user demographics

Creating complex Al models

Analysing emotions conveyed in text input

Building web interfaces.

34. Sophia is considering using a front-end framework for an upcoming web development project. She wants a framework that provides server-side rendering (SSR) and

seamless integration with a back-end server. Which front-end framework would you recommend to Sophia?

React.js

Angular

Next.js

Vue.js

35.

How can data be passed from one React component to another?

By using a server as a mediator

By using a parent component to pass data as props to its child component

By using direct method calls between components

By storing data in a global variable accessible to all components

36. Alex is working on a high-performance database project and needs to improve query performance by creating an index on a specific column. Which SQL statement

should he use to create an index?

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ALTER TABLE table_name ADD INDEX (column_name)

ADD INDEX idx_name ON table_name(column_name)

INDEX CREATE idx_name ON table_name(column_name)

37. Which HTML attribute links an external JavaScript file to an HTML document?

src

alt

href

rel

38. In Kubernetes, what is the primary purpose of a Service object?

Defining containerised applications

Storing configuration data

Exposing a stable network endpoint to access pods

Managing container replicas

39

Damon is leading a team of developers building a real-time collaborative platform that processes and synchronises JSON data between clients. What strategies should

Damon suggest to efficiently handle JSON data synchronisation, concurrency, and minimise conflicts in a real-time environment?

Implement 'CRDTs' (Conflict-Free Replicated Data Types) for conflict resolution and use 'WebSocket' for real-time data synchronisation.

Use 'MongoDB Change Streams' for real-time database updates and 'WebRTC' for peer-to-peer data synchronisation.

Apply 'JSON-Patch' and 'Operational Transformation' (OT) for fine-grained updates and conflict resolution in real-time data synchronisation.

Perform differential synchronisation with 'Delta Encoding' to optimise real-time JSON data updates and minimise bandwidth usage.

40. John is working on an loT project that involves collecting sensor data from various remote locations and requires real-time data processing and analytics. Which

advanced loT data processing solution should John consider for this project?

Use traditional data centers for centralised processing

Leverage edge computing with cloud integration

Use a single cloud server for data processing

Employ batch processing for data analysis

41.

Alice is a project manager overseeing a GitHub repository that contains sensitive customer data. What advanced security measures and best practices should Alice

implement to protect sensitive data from security threats and breaches?

Implement encryption for the entire repository and use GitHub's default access controls.

Enforce branch protection rules, conduct regular security audits, and educate contributors on secure coding practices.

Share sensitive data openly with contributors and trust their actions without additional security measures.

Implement a simple username and password system for access control and rely on GitHub's default security features.

43. What is the primary focus of back-end development?

Designing user interfaces

Managing server-side logic and databases

Optimising website performance

Creating visual elements on web pages

44.How can you handle form submissions in a React component?

By using the 'handleFormSubmit' method

45. What is the purpose of Python packages in software development?

Creating graphical user interfaces

Distributing and organising Python code and modules

Running unit tests on the Python code

Optimising the code for better performance

46. Diana is explaining the concept of semantic HTML to a group of junior web developers. They are discussing the concept of Semantic HTML. What explanation should se

provide of semantic HTML and its importance in web development?

Semantic HTML refers to using meaningful tags to convey the structure of a web page and its content. It is important for accessibility and SEO. Examples include

 and .

Semantic HTML refers to using non-meaningful tags like and . It is not important for web development.

Semantic HTML is not relevant in modern web development.

Semantic HTML refers to using anv HTML tags without specific meaning.

47. What does the 'componentDidMount' lifecycle method in a React component typically handle?

Updating component data

Setting initial component state and performing side effects

Rendering child components

Handling user interactions

48. Aiden is developing a web application for an e-commerce platform. He needs to provide a seamless shopping experience with real-time product availability updates.

Which technology or approach should he consider for this complex requirement?

Building a monolithic application

Implementing a microservices architecture with message queues

Conducting static code analysis

Focusing on unit testing for code quality

49. Louis is leading a team of developers tasked with optimising a Node.js application for high concurrency and low latency. What strategies should Louis recommend for

optimising the application's performance while handling a large number of concurrent requests?

Analyse application bottlenecks and implement microservices using 'Express.js' to distribute requests efficiently.

Include 'Cluster' module to leverage multiple CPU cores for parallel processing and apply 'Nginx' for load balancing.

Perform code profiling with 'node-inspect' to identify performance bottlenecks and refactor code accordingly.

Implement 'CQRS' and 'Event Sourcing' patterns for command and query separation and scalable data handling.

50. David wants to update the 'quantity' of a product in his database to reflect the new stock availability. Which SQL statement should David use?

UPDATE product SET quantity = 50 WHERE product_id = 123;

INSERT INTO product (quantity) VALUES (50) WHERE product_id = 123;

DELETE FROM product WHERE quantity = 50 AND product_id = 123;

ALTER TABLE product SET quantity = 50 WHERE product_id = 123;