**QUIZ - Individual**

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1. Please explain and compare:

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|  | **Monolith** | **SOA** | **Micro services** |
| Description | A single tiered website application that combines User Interface and data access code from a single platform. | Service oriented architecture is a software design where services are provided for other components of applications | Are software development technique that arranges an application as a collection of loosely coupled services |
| When to use it | If it’s a new idea or business model and will be evolved over time | When you want to reduce cost and developing custom solutions | When we want to deliver new features daily |
| Benefits (3 benefits) | Simple to develop, test and deploy | Services are reusable, easily maintained due to self-contained program, and increase the scalability and availability of the service | Enable services to be developed, scaled and deployed independently |
| Drawbacks (3 drawbacks) | Has limitation in size and complexity, complex to fully understand, the size of the app can slow down the startup time | High cost in terms of human resource, development and technology, high bandwidth server and extra overload due to validations of input before sending to service | More complex due to distributed system, more complex in testing and its more difficult to implement changes that span multiple services |
| Example | a single directory hierarchy of Rails or NodeJS code | POS (Point of Sale) | Spring Boot |

1. What are the differences between API and REST?

API is basically set of functions that allows an application to access the features of other applications, while on the other hand, REST is a guidelines to build a web API.

1. Please explain:
   1. RESTFUL : is an application program interface (API) that uses HTTP requests to GET, PUT, POST AND DELETE data.
   2. Load Balancer : process of distributing a set of tasks with the aim of making overall process more efficient
   3. CDN : stands for Content Delivery Network is a geographically distributed network of proxy servers and their data centers. The goal is to provide high availability and performance by distributing the service to end users.
   4. JWT : JSON Web Token is an internet standard for creating JSON-based access tokens that assert some numbers of claims.
   5. Hashing : Generating a value or values from a string of text by using mathematical function.
   6. Encryption : Conversion of something to code so that the contents cannot be displayed or understood if intercepted.
2. Can MVC be categorized as a framework? Give the reasons!

Yes, Model View Controller can be categorized as a framework, because all the components can be designed interface-based and tested using mock objects. By definition framework is a software providing generic functionality can be selectively changed by additional user written code.

1. Please explain on which conditions you need to use XML instead of JSON?

Web agents or robots ( web searches or other tasks ) should use XML, because XML provides a standard method to access information, making it easier for applications and devices of all kinds to use, store, transmit, and display data.

1. Please compare between Content Management Application and Content Delivery Application!

Content Management Application is the front end component of a CMS. The CMA interface allows user to create and manage website’s content. While on the other hand content delivery application is the service of copying the pages of a web site to geographically dispersed server’s end.

1. Please explain the following status code in error message and give the example!

|  |  |  |
| --- | --- | --- |
| **Status Code** | **Description** | **Example (on which conditions you can see the error message)** |
| 400 | Bad Request | When server cannot or will not process the request due to something that is perceived to be a client **error** |
| 404 | Page Not Found | When you try to access a web page that is already gone. |
| 500 | Internal Server Error | When something has gone wrong on the website’s server |
| 502 | Bad Gateway Error | When one server on the internet received an invalid **response** from another server |
| 504 | Gateway Timeout | When one server didn't receive a timely **response** from another server that it was accessing while attempting to load the web page or fill another request by the browser |

1. What are the differences between Apache and NGINX?

* Apache is an open-source HTTP server whereas Nginx is a high-performance asynchronous web server and reverse proxy server.
* Apache provides a variety of multiprocessing modules to handle client requests and web traffic, Nginx is so designed to handle multiple client requests simultaneously with minimal hardware resources
* In Apache HTTP server, single thread is associated with only one connection, whereas a single thread in Nginx can handle multiple connections
* Apache has a multi-threaded architecture which lacks scalability. Nginx, on the other hand, follows an asynchronous event-driven approach to handle multiple client requests.

1. Please explain on which conditions you need to use NGINX instead of Apache?

You need to use NGINX when a program designed by considering the performance and low memory consumption techniques. Because Apache’s performance starts decreasing once many concurrent users jump on your site where NGINX’s performance doesn’t drop.

1. Explain the technologies behind Single Page Application! (how to implement it)

Single Page Application is an app that works inside a browser and do not need page reloading during usage. Down below are the technologies that can be used to develop a single page application:

* MySQL Database

In order to implement mysql database, you just have to download xampp and turn on the mysql, and go to your browser and enter localhost/phpmyadmin and you are good to go.

* Apache Web Server

In order to implement apache web server, you just have to download xampp and turn on the apache, and go to your browser and enter localhost/php/ and you are good to go.

* PHP Programming Language Framework ( e.g. Laravel )

In order to implement PHP Programming Language Framework, you need to install the Laravel framework first using Composer and install the dependencies on your desired target. Open the web app through localhost/php and you are good to go.