CORE SOFTWARE ENGINEERING QUESTIONS

Instructions

This is the hiring assignment for the Software Engineer Team at Neurafarm. It consists of 22 essay questions related to Software Engineering. You are permitted to search the web for information. Fill in the available boxes and answer the questions carefully. Answer as much as you can, do not hesitate to include images/GIF if you feel it's important to explain your answer.

No.	Question
1.	**Which application from your portfolio are you most proud of? Describe it.**
	Answer: Notes App. The reason is because this project is a personal project based on my desire to learn android. In addition, this application can also be used for me, my family, and friends. In contrast to my other projects based on organizational needs.
2.	**What did you learn yesterday/this week?**
	Answer: A lot of things. Especially when building a responsive web application. Another thing I learned is how to manage time.
3.	**What is a recent technical challenge you experienced and how did you solve it?**
	Answer: To be honest, making responsive web application is a new challenge for me. The way I get through is by re-exploring CSS and when I met another obstacle, I search the solution in online community like stackoverflow.
4.	**Mention the Frontend frameworks you have used most.**
	Answer: Bootsrap
5.	**What do you think about current Dr. Tania application? How could**

	you improve it?
	Answer: Dr. Tania is an application to diagnose plant diseases through photographs. This application uses Artificial Intelligence technology (artificial intelligence) so that it can identify accurately and quickly. How to improve it ? In addition to the chatbot application, it can also be web-based in order to be able to reach more users.
6.	**Have you done unit testing or automated testing? Explain your experience.**

	Answer: Yes, I've done unit testing. I use Junit for my java project. It's faster and more reliable than manual testing.
7.	**When building a new web site or maintaining one, can you explain some techniques you have used to increase performance?**
	Answer: 1. Avoid inline CSS and JavaScript – By default, external CSS and JavaScript files are cached by the user's browser. We won't be taking advantage of the web browser's caching features if we place a lot of CSS and JavaScript in HTML document. 2. Minimize HTTP requests – There are several tactics that we can use, like use queries to only load what's needed or reduce the number of images. 3. Browser caching Browser caching allows assets on the website to be downloaded to user hard drive once into a cache, or a temporary storage space. Those files are now stored locally on user system, which allows subsequent page loads to increase in speed
8.	**Describe how REST APIs work.**
	Answer: REST is a way for two computer systems to communicate over HTTP in a similar way to web browsers and servers. REST utilizes four methods in HTTP 1. GET - requests a representation of the specified resource. 2. POST - used to submit an entity to the specified resource. 3. PUT - replaces all current representations of the target resource with the request payload. 4. DELETE - deletes the specified resource.
9.	**What is MongoDB? How is it different with MySQL? Tell us what makes MongoDB best? Explain.**
	Answer: MongoDB is a cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with schema. There is a difference in the representation of data in the two databases. In MongoDB, data represents in a collection of JSON documents while in MySQL, data is in tables and rows. One of the best things about MongoDB is that you are not responsible for defining the schema. MongoDB's performance is better than that of MySQL and other relational DBs. This is because MongoDB sacrifices JOINS and other things and has excellent performance analysis tools.
10.	**What is Gitflow Workflow? Explain.**
	Answer: The Gitflow workflow is a strict branching model that provides a robust framework for managing large projects and teams. This workflow assigns

	specific responsibilities to named branches in the repository and defines how and when they should interact.
11.	**How would you design a chess game? What classes and objects would you use? What methods would they have? Write the classes in Node.js or Python.**
	Answer:
12.	**Explain the difference between cookies, session storage, and local storage?**
	Answer: The local storage stores the data with no expiration date. The data will not be deleted when the browser is closed, and will be available the next day, week, or year. The session storage is equal to the localStorage, except that it stores the data for only one session. The data is deleted when the user closes the specific browser tab. Cookies stores data that has to be sent back to the server with subsequent requests. Its expiration varies based on the type and the expiration duration can be set from either server-side or client-side (normally from server-side).
13.	**How is lazy loading achieved? When is it useful? What are its pitfalls?**
	Answer: Lazy loading (also called on-demand loading) is an optimization technique for the online content, be it a website or a web app. How It's achieved ? Instead of loading the entire web page and rendering it to the user in one go as in bulk loading, the concept of lazy loading assists in loading only the required section and delays the remaining, until it is needed by the user. It's usefull when not noticing any performance issue. For example, store a lot of data in the database sorted. What are it pittfals ? lazy loading may affect the website's ranking on search engines sometimes, due to improper indexing of the unloaded content
14.	**What are the differences between variables created using let, var or const? (Javascript)**
	Answer: - **var** variables can be updated and re-declared within its scope; **let** variables can be updated but not re-declared; **const** variables can neither be updated nor re-declared. - While **var** and **let** can be declared without being initialized, **const** must be initialized during declaration.
15.	**Explain how prototypal inheritance works (Javascript)**
	Answer: Prototypal Inheritance is that an object can point to another object and inherit all its properties. The main purpose is to allow multiple instances of an object to share common properties, hence, the Singleton Pattern. For instance, we have a **user** object with its properties and methods, and want to make **admin** and **guest** as slightly modified variants of it. We'd like to reuse what we have in user, not copy/reimplement its methods, just build a

	new object on top of it.
16.	**Imagine there's a perfect clone of yourself. Imagine that that clone is your boss. Would you like to work for him/her? Why?**
	Answer: Yes. Because I know what responsibility is, both as a team member, and also as a leader.
17.	**Explain how this works in JavaScript.** ● **Can you give an example of one of the ways that working with**

		this has changed in ES6?
		Answer: In JavaScript, the property of an object can be a method or a simple value. When an object's method is invoked, then **this** refers to the object which contains the method being invoked.
18.	**What are some of the testing best practices?**	
	Answer: Plan and Define Strategy, Design Scenarios and Enforce Reviews, Identification of Test Data, Communication	
19.	**What tools would you use to test your code's functionality?**	
	Answer: JEST	
20.	**What are some ways you may improve your website's scrolling performance?**	
	Answer: use : `will-change: transform;`	
21.	**Traditionally, why has it been better to serve site assets from multiple domains?**	
	Answer: 1. Reduce header overhead. 2. Parallelization	
22.	**What is a CDN and what is the benefit of using one?**	
	Answer: A CDN can ensure that a network has a high data threshold. A large number of users can thus access the network at the same time without delays. By enabling a high traffic flow, CDN allows people from all over the world to access our website simultaneously. Benefits : Because CDNs are placed closest to the user, it's possible to reduce latency when the distance that your content needs to travel is shorter. Thus, CDN can make our website load much faster.	