Homework

1- **Conway's Law** is an IT theory created by computer scientist/programmer Melvin Conway in 1967. Conway's Law states that "Organizations, who design systems, are constrained to produce designs which are copies of the communication structures of these organizations."

2- **Software as a Service(SaaS)** is a method of software delivery that allows data to be accessed from any device with an internet connection and a web browser. In this web-based model, software vendors host and maintain the servers, databases, and the code that makes up an application.

   Platform as a Service (PaaS), provide cloud components to certain software while being used mainly for applications. PaaS delivers a framework for developers that they can build upon and use to create customized applications. All servers, storage, and networking can be managed by the enterprise or a third-party provider while the developers can maintain management of the applications.

   Infrastructure as a Service (IaaS), are made of highly scalable and automated compute resources. IaaS is fully self-service for accessing and monitoring computers, networking, storage, and other services. IaaS allows businesses to purchase resources on-demand and as-needed instead of having to buy hardware outright.

   On-premises software is installed and runs on computers on the premises of the person or organization using the software, rather than at a remote facility such as a server farm or cloud. On-premises software is sometimes referred to as "shrinkwrap" software, and off-premises software is commonly called "software as a service" ("SaaS") or "cloud computing".

3- **Continuous integration** is a coding philosophy and set of practices that drive development teams to implement small changes and check in code to version control repositories frequently. Because most modern applications require developing code in different platforms and tools, the team needs a mechanism to integrate and validate its changes.

   The goal of **continuous delivery** is to deliver a packaged artifact into a production environment. CD automates the entire delivery process, including the deployment process. CD responsibilities can include provisioning infrastructure, managing changes (ticketing), deploying artifacts, verifying and monitoring those changes, and ensuring these changes do not happen if there are any issues.

   Continuous Deployment (CD) is a software release process that uses automated testing to validate if changes to a codebase are correct and stable for immediate autonomous deployment to a production environment. The software release cycle has evolved over time.

4- An **API gateway** provides a single endpoint or URL for the client applications, and it internally maps the requests to internal microservices. A layer of abstraction is provided by hiding certain implementation details (for example, the Lambda function name and version), and additional functionality can also be added on top of the backend service, such as response and request transformations, endpoint access authorization, or tracing.

5- **Backend For Frontend** is a design pattern created with not only the developer but, more importantly, the user and their experience in mind. It is the answer to the ever-growing adoption of applications to meet, interact, and serve customers, ensuring consistency while still meeting their diverse and evolving needs.

6- **The Circuit Breaker pattern** is a popular design pattern used in Microservices Architecture, that falls under the Sustainable Design Patterns category. In Microservices architecture, a service usually calls other services to retrieve data, and there is the chance that the downstream service may be down.

7- **Microservice chassis pattern** cuts down on the redundancy factor and complexity across services by abstracting the common logic to a separate layer. If you have a very generic chassis, it could even be used across platforms or organizations and wouldn't need to be limited to a specific project. It depends on how you write it and what piece of logic you move to this framework.