ASSIGNMENT 3

A well-structured report for **Assignment 3: Trends and Cloud Services Overview**:

Serverless Architecture is a cloud-native development model that allows developers to build and run applications without managing the underlying infrastructure. In serverless environments, cloud providers automatically allocate resources and scale applications based on demand. This leads to benefits such as reduced operational complexity, lower costs (pay-as-you-go model), and faster deployment cycles. Developers can focus purely on writing business logic, while the cloud handles provisioning, scaling, and maintenance.

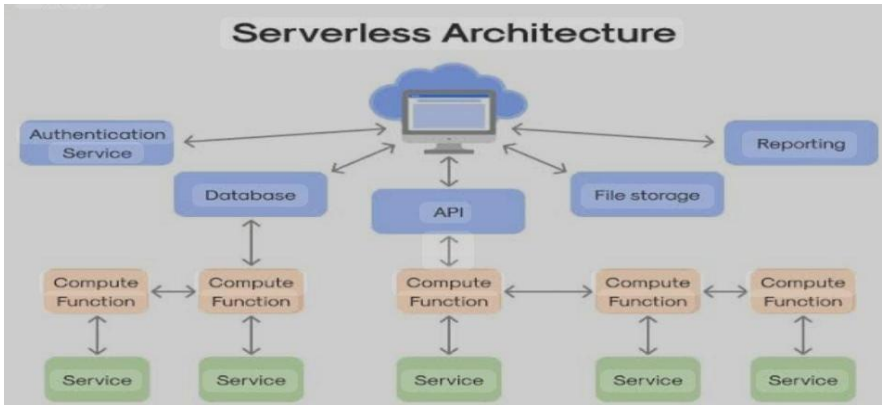

Fig 1.0 Severless Architecture(ref google)

Progressive Web Apps (PWAs) are web applications that provide a native app-like experience directly through a browser. PWAs use modern web capabilities like service workers, caching, and push notifications to enable offline access, quick loading, and re-engagement features. They can be installed on a user's home screen and work across devices and platforms without requiring app store downloads. PWAs are lightweight, secure (served via HTTPS), and provide a seamless user experience, especially in environments with limited connectivity.

Fig 1.1 **Progressive Web Apps PWAs(ref google)**

Artificial Intelligence (AI) and Machine Learning (ML) play a transformative role in modern software architecture. They enable applications to make intelligent decisions, automate processes, and improve over time through learning from data. AI/ML models can be integrated into systems for tasks such as recommendation engines, fraud detection, natural language processing, and predictive analytics. Architecturally, AI/ML often involves the use of data pipelines, model training platforms, and inference services that scale with user demand and data volume.

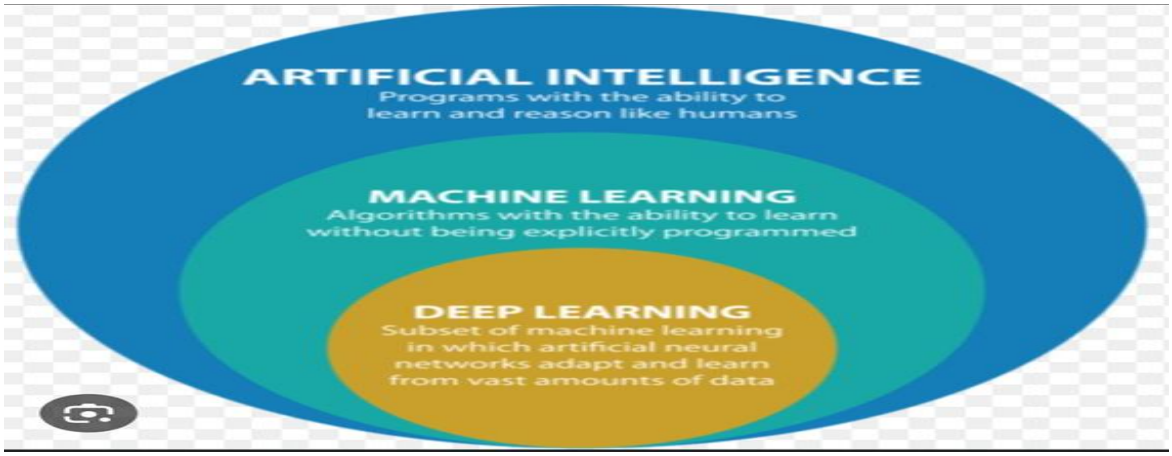

Fig 1.3 **Artificial Intelligence (AI) and Machine Learning (ML) (ref google)**

Cloud computing service models include **SaaS (Software as a Service)**, **PaaS (Platform as a Service)**, and **IaaS (Infrastructure as a Service)**. **SaaS** delivers ready-to-use applications over the internet (e.g., Gmail, Salesforce). **PaaS** provides a development platform with tools and frameworks to build, test, and deploy apps without worrying about infrastructure (e.g., Google App Engine, Heroku). **IaaS** offers virtualized computing resources like storage, networking, and VMs (e.g., AWS EC2, Microsoft Azure VM), giving users full control over the environment. Each model serves different needs, from end-user software to complete development and hosting environments.

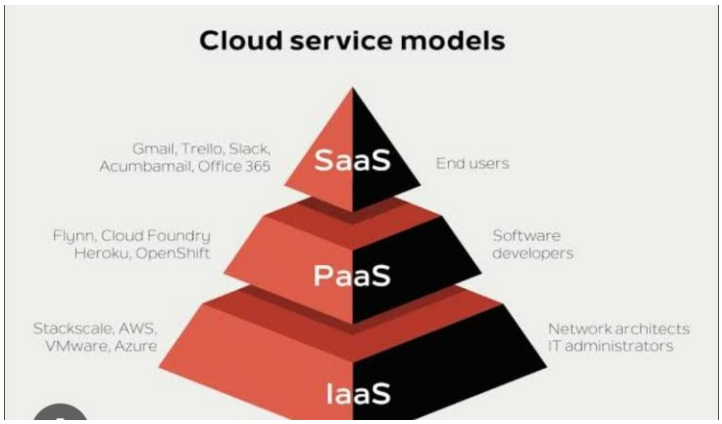

Fig 1.4 Cloud computing service models(ref google)