09/13/2022:

The lectures began with a review of layered architecture and application layering, after which we moved on to talk about the RESTful architecture. Layered architecture arranges many components in layers. Each layer communicates with the layer next to it by sending requests and receiving answers. A layered architecture is used to separate components into units. It is an effective way to communicate. Any layer cannot communicate directly with another layer. There are restrictions for building web services in distributed hypermedia systems according to the REST style, a set of software engineering standards. REST is a protocol, component, and language-neutral architecture; it is neither a tool nor a language.

The fact that REST is an architectural approach and not a toolbox must be emphasized. REST provides a collection of architectural guidelines for creating stateless services that are exposed as resources and, in some cases, sources of specialized data and functionality. A distinctive Uniform Resource Identifier is used to identify each resource. The architecture of Amazon's storage service S3 has since been demonstrated, showing how it aids in the development of scalable systems.

Next, we had a discussion regarding referential and temporal linkage. Direct coordination, which happens when processes are connected directly, occurs when processes are both temporally and referentially coupled. Referential coupling is most frequently observed in communication via explicit reference. For instance, in order to exchange information with another process, a process must first know the name or unique identification of that process. Communication mechanisms must be active simultaneously due to their temporal interdependence. The combination of referentially and temporally disconnected processes, as exemplified by Gelernter's Linda programming system's generative communication, is the most well-known coordination model. A collection of independent processes use a common, permanent dataspace of tuples, which is the fundamental idea of generative communication.

We spoke about the design of centralized systems. The benefit of a centralized strategy is that building synchronization primitives is simple. Process synchronization is possible without the need for process communication, for instance, by allowing a process to pause until the right data item is published before executing a destructive read to remove the matching tuple.

09/15/2022:

We talked about the algorithms for gossip. A peer-to-peer computer communication mechanism called an epidemic protocol, commonly referred to as a gossip protocol, is motivated by the spread of disease. Some distributed systems rely on peer-to-peer informal word-of-mouth for information delivery. Some ad hoc networks can only share information by having each node inform its neighbors since they lack a central database. It can be useful to use the example of office workers spreading rumors to explain the idea of gossip communication. One of the gossip-based aggregation methods that is based on the interactive pairwise distribution of aggregated data among specific entities is the push sum protocol, which we discussed.

The averaged quantity's value and its weight are stored by the entities in order for them to properly perform the functionality that was defined. Each entity is given an initial value, which is changed after each iteration based on the condition of the entity as well as the data collected from the nodes nearby. Each entity's weight parameter value is initially set to 1 at the start of the entire operation. It assigns to this entity the value and weight that are equal to half of its normal amount and size, respectively.