

Graphs



Introduction

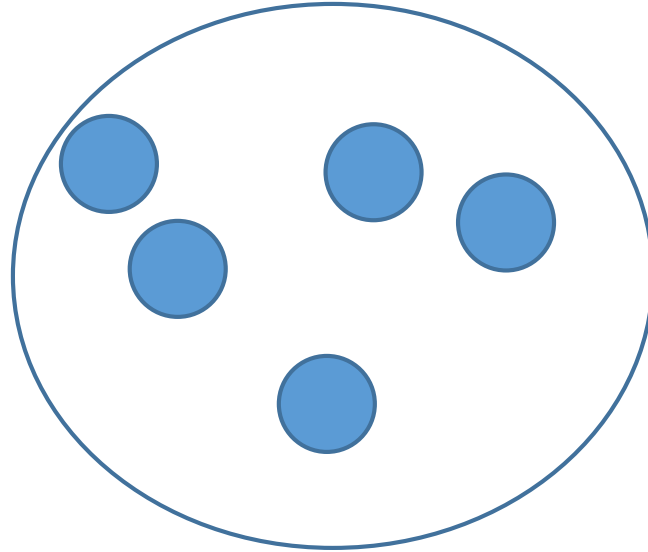


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by Christine Alvarado, Mia Minnes, and Leo Porter, 2015.**

By the end of this video you will be able to...

- Explain when the Graph ADT is useful
- Compare the Graph ADT with other ADTs

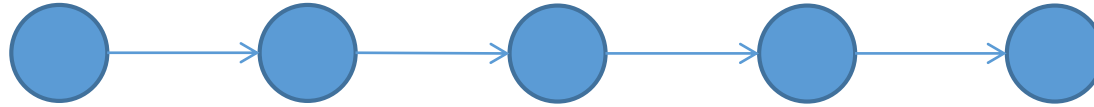
ADTs



Unstructured structures

Sets

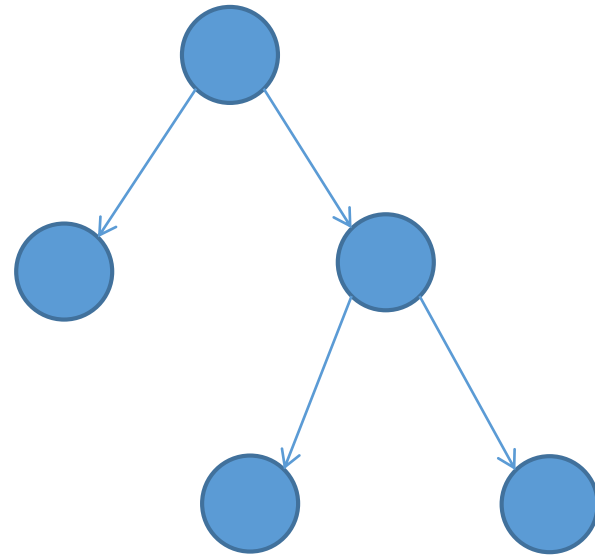
ADTs



Sequential, linear structures

Arrays, linked lists

ADTs

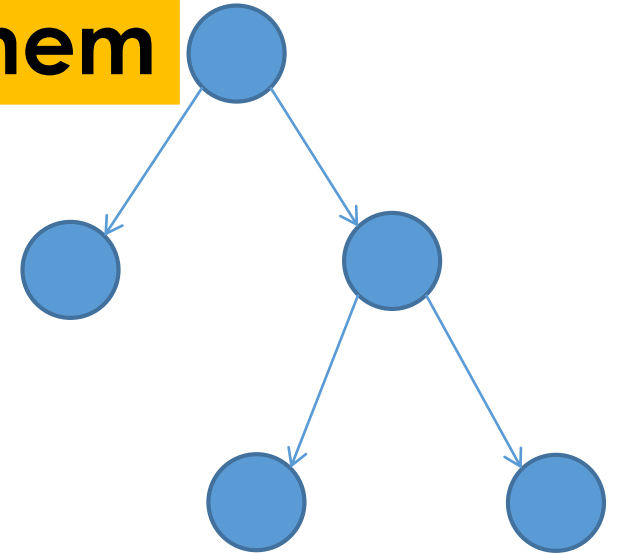
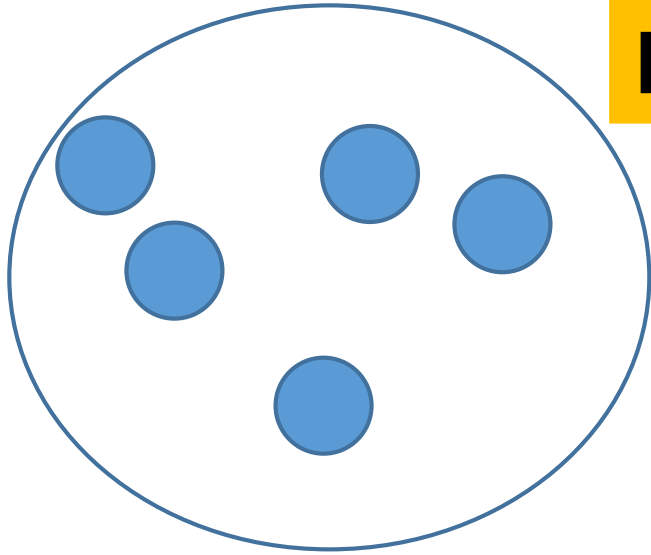


Hierarchical structures

Trees

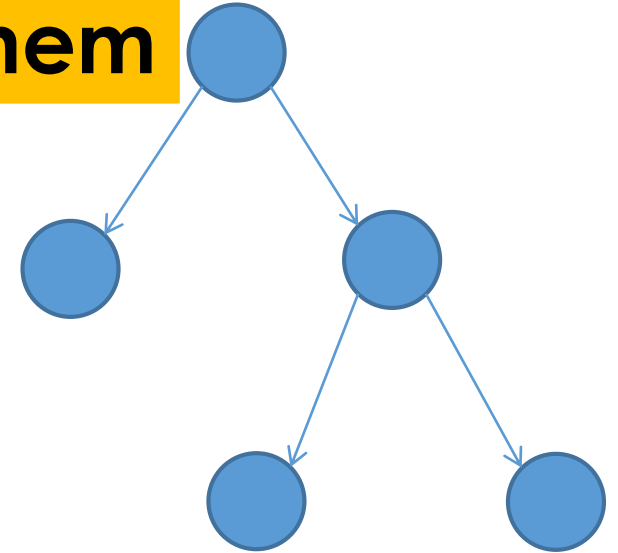
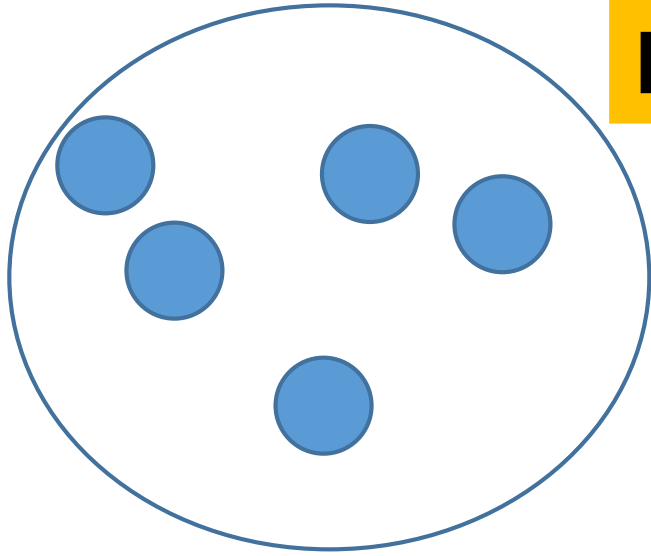
ADTs

Basic objects & Relationships between them



Graphs

**Basic objects
&
Relationships between them**



Graphs

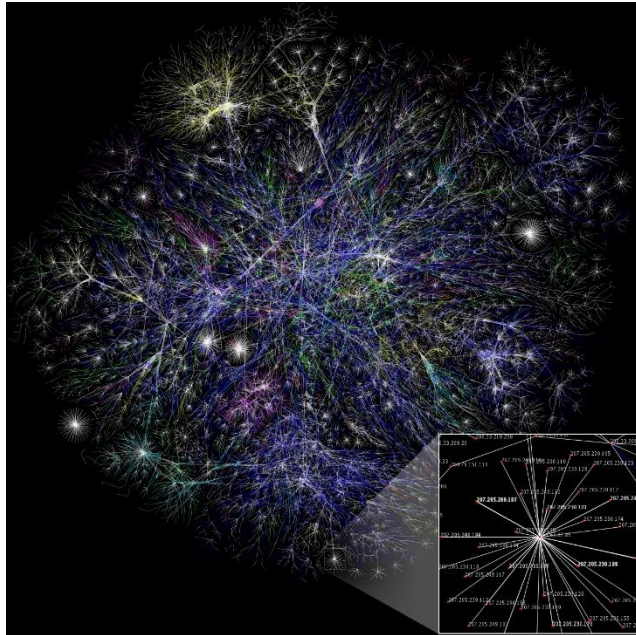
Basic objects : vertices, nodes

Relationships between them : edges, arcs, links

Graphs

Basic objects : websites

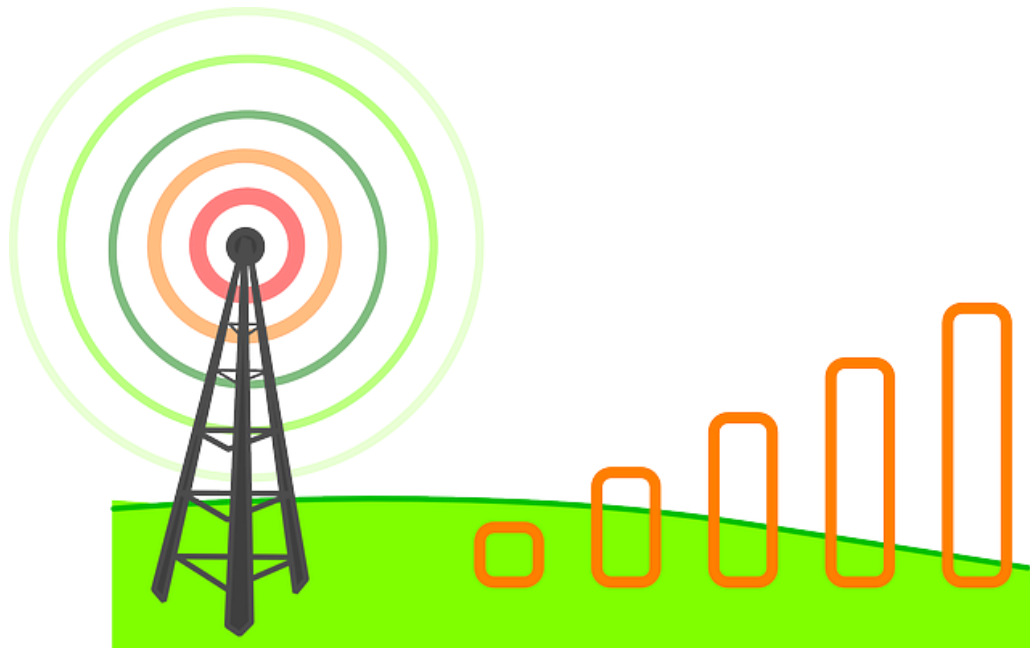
Relationships between them : hyperlinks



Graphs

Basic objects : cell phone towers

Relationships between them : coverage area overlaps



Graphs

Basic objects : people

Relationships between them : friends



Graphs

See project ...

Basic objects : cities

Relationships between them : nonstop flights



Graphs

Basic objects : cities

Relationships between them : nonstop flights OR roads

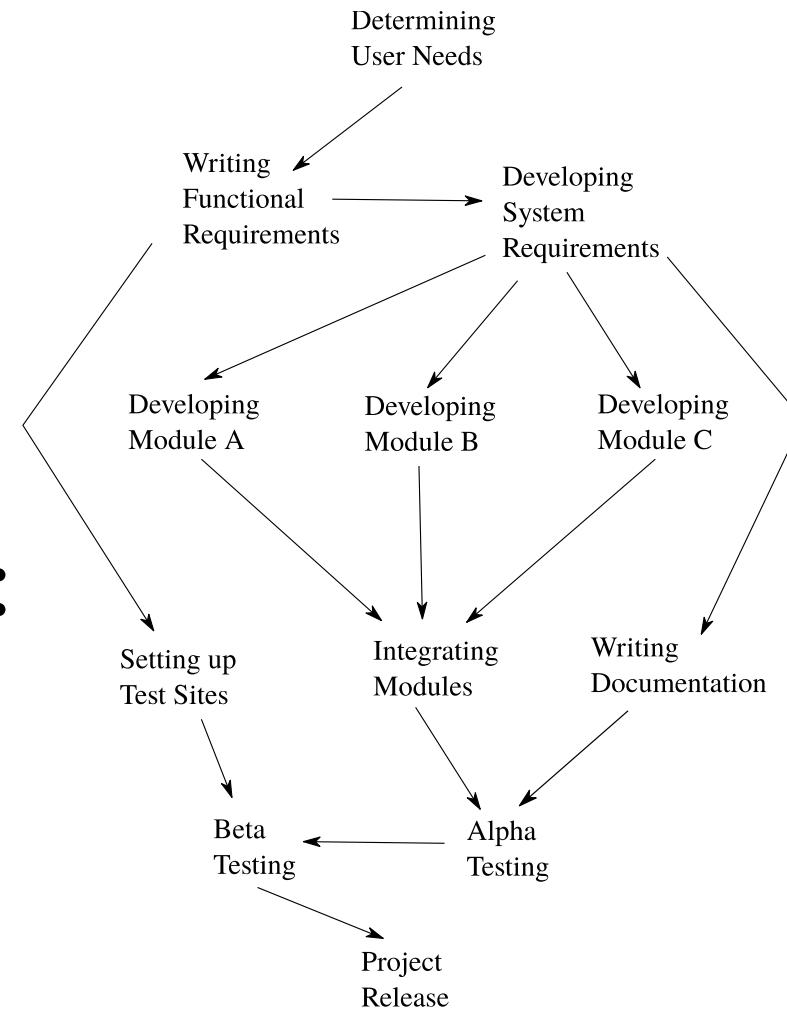


Label or weight edges

Graphs

Basic objects : tasks

Relationships between them : dependencies



Graph ADT

- **Create a graph.**
- **Are two vertices adjacent?**
- **Is the graph dense? sparse?**
- **How far are two vertices in the graph?**
- **How many components are there in the graph?**
- **Can we find a vertex with particular key value?**

Next step

- So, how do we define graphs?