### UML Diagram Types

#### Behavioral Models
- activity diagrams
- *statechart diagrams*
- interaction diagrams
  - sequence diagrams
  - collaboration diagrams
- *use case diagrams*

#### Structural Models
- *class diagrams*
- object diagrams
- packages

#### Architectural Models
- component diagrams
- deployment diagrams

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### Software Engineering Process Models

**Models to be discussed**
- Sequential/Waterfall Model
- Prototype Model
- Incremental Model
- Spiral Model

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### Generic Parts of Each Model

- **System Engineering:** establishing requirements for how system being designed fits into larger system
- **Requirements Analysis:** focus on specific software implementation and what the software system must do
- **Design:** focus on how the software system will be implemented
  - data structure
  - software architecture
  - interface representations
  - algorithmic detail
- **Code:** writing software
- **Test:** testing software against some criteria (requirements, design, etc)
Sequential/Waterfall Model
Stepped process of:
- analysis
- design
- code
- test

Pros
- projects rarely follow described path
- often difficult to state requirements upfront
- working version not available to the end

Cons

Prototype Model
Build, then throw away
Quick design to show capability

Pros
- customer want apparent working system
- implementation compromises to obtain quick working system

Cons

Incremental Model
Pipelined waterfall model
Move resources at completion of increment
Primary core path, followed by add’l functionality paths

Pros
- specialization and redeployment of implementation teams
- gradual increase of personnel
- increments planned to manage technical risks
Spiral Model
- Evolutionary combination of prototyping and waterfall models
- Communication key to success
- Pros
  - realistic approach to large-scale systems
  - systematic stepwise refinement of software

Summary
Common Partitions of Each Model
- System Engineering
- Requirements Analysis
- Design
- Code
- Test

Summary
Suggested Process Models
- Sequential/Waterfall Model
- Prototype Model
- Incremental Model
- Spiral Model

Seldom is any one model followed ‘purely’