Requirements & Modeling
Administrative stuff

• My office hour
  • Thursday: after lecture
  • Tuesday/Monday ??

• TA office hour
  • Tuesday 4:30—6:30 @ CSIL 1/2

• Warm-up project

• Quiz

• Project ideas
Project Proposal

• You are required to work on this in a **2-person or 3-person group**.
• You will brainstorm with your group members to propose a software project that a 6-8 person group, including you, will work on for the remainder of this quarter.

• **What to submit:**
• The whole group will submit one copy of the proposal document.
• This document needs to include the following items:
  • 1. What programming language you plan to use;
  • 2. What programming IDE you plan to use, if you plan to use any;
  • 3. A brief overview of what you are proposing (be brief here)
  • 4. A complete use-case diagram of the proposed project
  • 5. Choose one of the following two options to describe every use case
    • option 1: activity diagram, following the format we discussed in lecture
    • option 2: use case text description, following the format we discussed in lecture
  • 6. Optional: tell us whatever you think can help convince us to accept your proposal
Outline

• Definitions
  • Requirement, requirement engineering
• Why?
• How to write the requirement document?
• How to find out and model the requirements?
Definitions
What are requirements?
What are requirements?

• The services the software should provide

• The constraints the software should follow

• Functional requirements

• Non-functional requirements
What is requirement engineering (RE)?

• The process of
  • Finding out
  • Analyzing
  • Documenting
  • Checking
these desired services and constraints
is Requirement Engineering
Motivations
Who will read requirement document?
What is the usage of requirement document?
What to put in a requirement document?
What should be included in the requirement?
What should be included in the requirement?

• Functional requirement
  • Input, output, features, ...

• Non-functional requirement
Non-functional requirements

- Non-functional requirements
  - Product requirements
    - Efficiency requirements
    - Reliability requirements
    - Performance requirements
  - Organizational requirements
    - Portability requirements
    - Space requirements
  - External requirements
    - Interoperability requirements
    - Legislative requirements
    - Standards requirements
    - Privacy requirements
    - Safety requirements
Non-functional requirements

• Try to use quantitatively measurable metrics to describe them
• Examples
Requirement document format

• IEEE standard
  • http://en.wikipedia.org/wiki/Software_requirements_specification
How to find out the requirements
System modeling
Use case diagrams

• A diagram includes
  • Actors
  • Use cases
  • System boundary
Use case text

- Use case name
- Use case priority
- Main *scenario*
  - Steps
- Extensions
  - Steps
Example
How to map it to eXtreme Programming?
Activity diagrams

• An activity --- multiple actions
  • Can be used to describe a use case
  • Can represent parallel relationship
Activity diagram components

• Components
  • Start
  • Actions
  • Fork/Join
  • Decision/Merge
  • Flow
  • Final
Example
What else?

- State diagram
- Class diagram
- Sequence diagram