San José State University
Department of Computer Engineering

CMPE 135
Object-Oriented Analysis and Design

Spring 2021
Instructor: Ron Mak

Assignment #2

Assigned: Tuesday, February 16
Due: Friday, February 26 at 11:59 PM
Team assignment, 100 points max

Design Specification

Write a Design Specification for your semester project. Be creative – at the end of the semester, we won't hold you to this design. A design spec should be read and understood by the software developers.

Your specification should include:

- **Well-design classes** that are cohesive and loosely coupled.
- **UML class diagrams** for your important classes. Show the relationships between classes using the appropriate connectors. Show any multiplicity. Include some important attributes (member variables) and methods (member functions).
- **UML sequence diagram** that shows the communication patterns among your objects at run time for a key functionality of your application. Pick a use case and diagram its sequence. You can choose a use case from your Rock-Paper-Scissors game, or a likely use case from your semester project. Illustrate the interaction among your objects during the execution of the use case.
- **UML state diagram.** Pick a class from Assignment #1 and show how one of its objects transitions from state to state during its lifetime at run time

Include at least four important classes in your UML diagrams. Use a UML drawing tool to create the diagrams and insert the diagrams into your specification. Two free UML drawing tools:

- Violet: http://horstmann.com/violet/
- StarUML: http://staruml.sourceforge.net/en/

Design tips

Some points to consider as you design your application.

- Use the requirements and use cases from your Functional Specification to discover classes and their attributes and methods.
- Make sure your classes are cohesive and loosely coupled.
- What will change in your design? How will you encapsulate what changes?

Use your imagination! You will not be asked to write a program that implements everything you put in your Design Specification.

What to turn in

Each team should create a PDF containing the Design Specification. Submit it into Canvas: **Assignment #2**

This is a team assignment. Each member of the team will receive the same score.

Rubric

Your Design Specification will be graded according to these criteria:

Criteria	Max points

• **Well-designed classes** (at least 4)
  ○ Good names (each a singular noun)
  ○ Well-named attributes (member variables)
  ○ Well-named methods (member functions)
  ○ Cohesive (each class has a primary responsibility)
  ○ Loosely coupled (minimum dependencies among classes)
  ○ Good encapsulation of what can change
	• **30**
	  ○ 5
	  ○ 5
	  ○ 5
	  ○ 5
	  ○ 5
	  ○ 5

• **UML class diagrams**
  ○ Correctly drawn class diagrams
  ○ Good class relationships (dependency, aggregation, inheritance)
	• **30**
	  ○ 15
	  ○ 15

• **UML sequence diagram**
  ○ Good choice of objects
  ○ Good interactions among objects
	• **20**
	  ○ 10
	  ○ 10

• **UML state diagram**
  ○ Correctly drawn diagram.
  ○ Good choice of states
	• **20**
	  ○ 10
	  ○ 10