CS 3321 or INFO 3307/5307
Homework 3 – Design Solutions

Solution Key

Assigned: October 07, 2019
Due: November 01, 2019 @ 2300h

Questions (50 points)

1. **(30 points)** Settlers of Catan is a popular board game. Under the link above are the rules for the game.

   Guess, what, you missed a meeting of your team and they have decided to ditch the old iteration 1 idea and make a computer app version of this game instead. They have put you in charge of making a domain model (in the form of a UML class diagram) to understand the objects in the game and their relationships better. So, using the English description on the webpage above, make a UML class diagram of the underlying game structure.

   - We suggest you use the nouns/verbs technique to find classes (nouns) and methods (verbs).
   - You can assume the board has already been fixed at the beginner setup, the computer program will not need to put the pieces of the board together.
   - You don't need to try to understand and encode the rules in the diagram, only the different entities and how they relate.
   - Do include some actions the players will need to perform as methods – they will be verbs in the description.
   - There are quite a few entities described, you can stop at ten classes. You also will need to include five methods; don't include obvious getter/setter type methods.
   - Make sure to include associations and use inheritance where it fits.
   - You need to have at least one inheritance relationship in your answer as there are several ones in the game structure. Remember, "(subclass) is-a (superclass)" (plug in potential sub and super) is a sentence that should make sense in subclass relationships.
   - See the design lecture notes on the UML class diagram features to use: classes, associations, multiplicity, inheritance, whole-part relationships, fields, and methods. You need not use any other UML widgets.

   30 Points if they did it and it makes sense based on experience with catan?
   Must have at least 10 classes
   Should use inheritance, aggregation, association, and composition correctly
   Needs to have multiplicity, correct
   Should have key fields and methods
   Anything missing is a reduction by 2 points per item

2. **(10 points)** Just as we were using class diagrams above to understand a real-world domain, use-cases can also be used to describe "IRL" activities. Write a use-case for the process of grabbing food at your regular lunch spot. Or, if you eat at home describe the activity of making your lunch, including some variations of the different choices you make. For example: if its the dorm cafeteria food, you may start off by getting a tray, and there may be several islands such as the salad bar, grill, etc to choose food from, etc. Include at least five steps in your use-case. **Note: This is not a Use-Case Diagram, but rather the Use-Case description which describes a single Use-Case**

   10 Points if it is a Use Case, which fully describes the concept
   5 Points if they are missing key components
   0 Points if they did a Use-Case Diagram

3. **(10 points)** Using the Use-Case you created in number 2 above, construct an Activity diagram to represent the main sequence and any potential alternative processes and error situations.

   10 Points if the Activity Diagram represents their UseCase
   5 points if they are missing core components or if the diagram has serious flaws (language wise)
   0 points if they missed the boat completely

Submission

Submit a PDF file to Moodle by the deadline noted above. Any other file format will not be accepted. Late assignments will be handled according to the late assignment policy.