

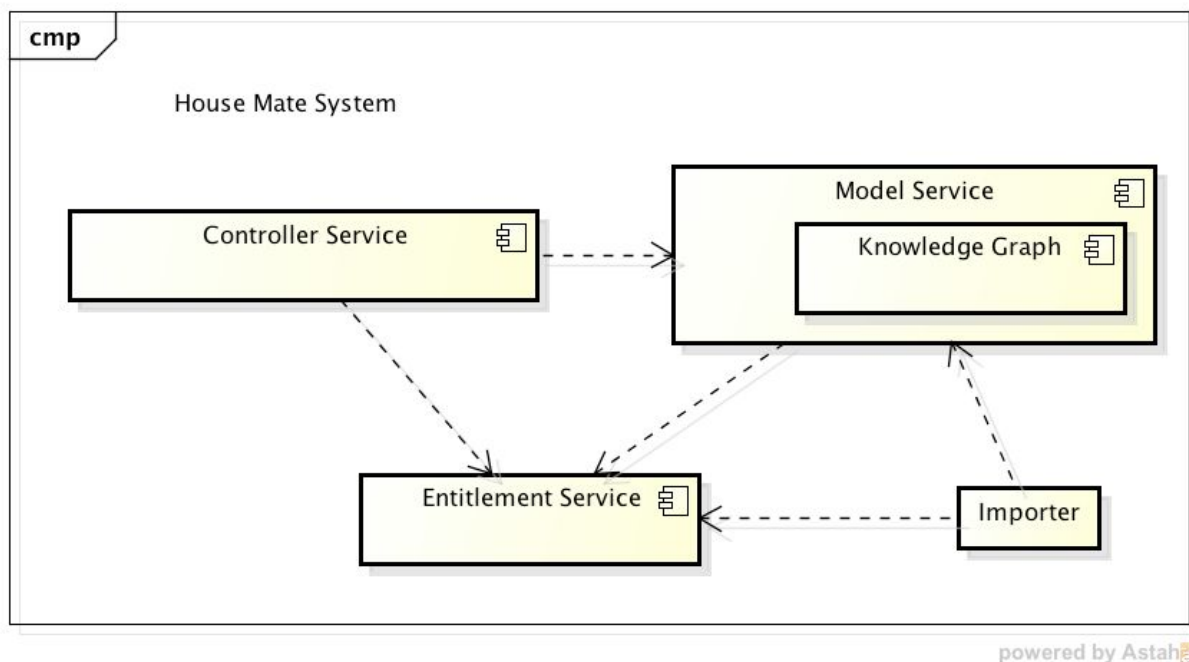
**CSCI E-97****Assignment 4, House Mate Entitlement Service****Due: Wednesday, 11/18/2015, 11:59pm EST**

## Introduction

In this assignment you will continue the development of the House Mate application. You will design and implement an Entitlement Service.

## Overview

The following diagram shows how the Entitlement Service fits into the overall structure of the House Mate application.



Caption: House Mate modules and dependencies including the Entitlement Service.

The Entitlement Service supports controlling access to the House Mate application and the IOT devices.

Please refer to the Entitlement Service Requirements document for more details.

As part of your solution, you should apply the following design patterns:

1. Use the **Visitor Pattern** to:
  - a. support traversing the objects of the Entitlement Service to provide an inventory of all Users, Resources, Accesses, Roles, and Permissions.
  - b. Checking for access
2. Apply the **Abstract Factory Pattern** to create instances of the Entitlement Service domain classes.
3. Use the **Singleton Pattern** to return a pointer to an implementation of the Entitlement Service.
4. Use the **Composite Pattern** to manage the whole part relation of Roles and Permissions.

In the design portion of the assignment, you will create a software design document that satisfies the Entitlement Service requirements.

In the implementation portion of the assignment, implement your design and test your solution.

You will have 3 documents as input to your design:

- Entitlement Service Requirements Document describing the functional requirements.
- House Mate System Architecture Document
- Software design template (from assignment 2) as a base for your design document.

## Development Process

This will be the 3rd of 3 sprints to implement the House Mate application. We will continue to follow the design first development process outlined in assignment 2.

For this assignment, a peer design review is required. New peer design review groups are created. If you have any questions regarding the peer design reviews, please contact the teaching staff. Please work with your partner to complete the design reviews by Monday, November 9th.

### Assignment Notes:

The goal of this assignment is to design and implement a solution within the context of a collaborative agile development environment.

Reuse the design template from assignment 2. Your design document should include the following:

- UML Use Case Diagram (with descriptions for each use case)
- UML Class Diagram
- Class Dictionary
- UML Sequence Diagram(s) (showing the flow of events for checking Access)

You should implement the Entitlement Service classes as defined by the class diagram and class dictionary specified in your design document. All Entitlement Service classes should be defined within the package “cscie97.asn4.housemate.entitlement”.

Reuse your House Mate Model Service API and House Mate Controller Service API from assignments 2 and 3.

Update the implementations of Model Service and Controller Service to delegate to the Authentication Service checkAccess method. Update the calling methods to handle a possible AccessDeniedException.

Reuse your TestDriver class from assignment 3 to load in the House Mate provisioning and sensor updates information. Modify the TestDriver to import the Entitlement Service information.

In the Test Driver, create the Authentication Service Services, Permissions, Roles, and Users first. Then login to create an accessToken, and use this accessToken to pass to the restricted access the methods.

The new TestDriver should be placed in the package: “cscie97.asn4.housemate.test”.

When implementing your design, please document any variances from the design, provide justification for your changes and describe how your changes continue to support the requirements.

Remember to use Java doc to document all classes and methods. Add java comments inline where appropriate to explain code logic.

## What To Turn In

You'll turn in a zip file containing

- Your source code (no .class files)
- Your input data files
- Sample output
- Your design document (in pdf format)
- Include a document (in pdf format) describing your results:

- Comments from peer design review and optionally the functional review
- Any implementation changes that you made to your design and how they continue to support the requirements
- How could the design have been better, clearer, or made the implementation easier?
- Did the **design review** help improve your design?
- Is the design process getting easier?

We should be able to unzip your file into a directory, then cd into that directory and compile your program with the command.

- `javac cscie97/asn4/housemate/model/*.java cscie97/asn4/housemate/controller/*.java cscie97/asn4/housemate/entitlement/*.java cscie97/asn4/housemate/test/*.java`

We should be able to run your program with the command

- `java -cp . cscie97.asn4.housemate.test.TestDriver housemate3.txt`

where housemate3.txt contains a set of commands to configure the House Mate application.

Caution: When you believe you're done, try zipping your files, then unzipping them into a totally different directory and following the steps above. In other words, test your packaging before you submit your assignment.

A grade sheet specifying the criteria for grading this assignment will be posted on the course website.