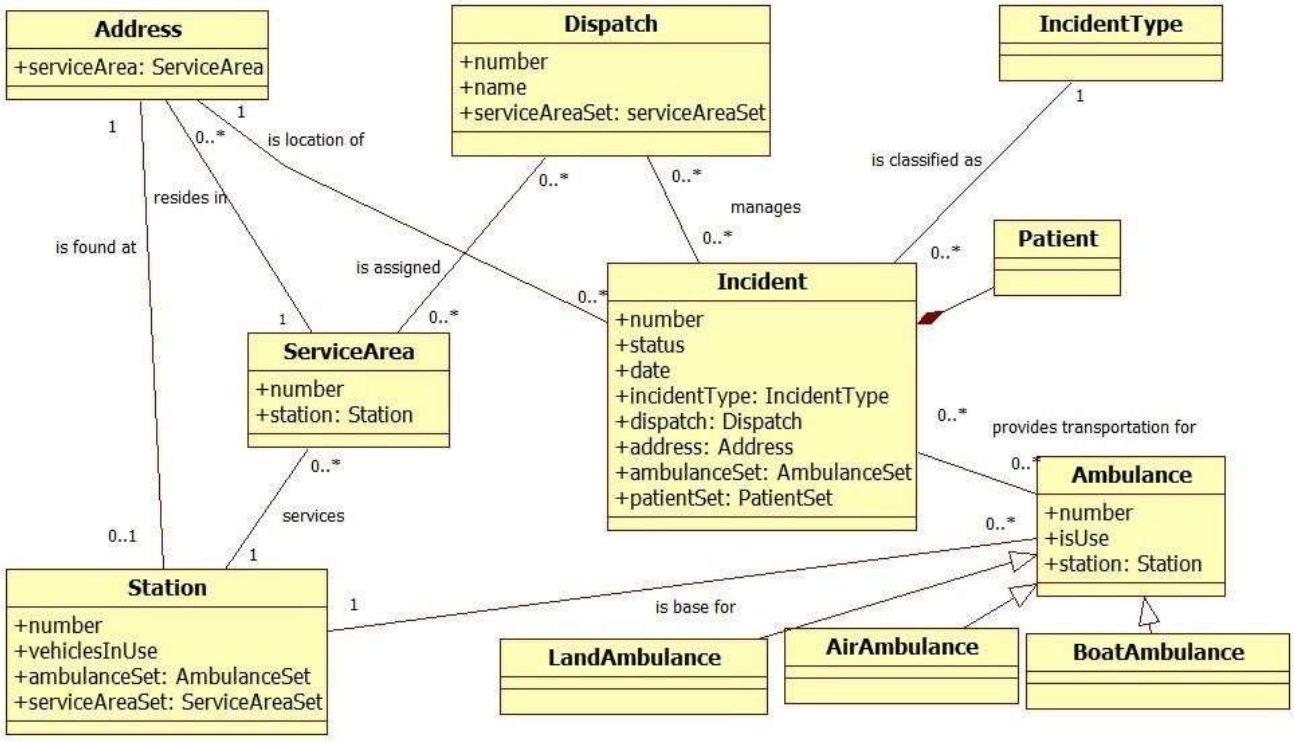
SYS466 Summer 2017
Assignment 3 (5% of the final grade):
Dynamic Modelling Diagrams
Due Date: Friday July 28, 2017 (any time)

- Work on this assignment in groups of **2 or 3 members**
- Refer to the domain model below in order to answer the assignment questions
- When you are done please post your model to Blackboard and name it using the following naming convention "Group##_Ass3.uml". **Please do not zip your model**. All diagrams must have an annotation with student name and number of each member in your group

Case Study - Emergency Response System

The application to be designed tracks "911" calls and records ambulance activity for a municipality. The following is a class diagram to describe the domain model.

Class Diagram



Services

The following services are assumed to exist.

- Location Service – given GPS coordinates it returns an *Address object*
- Voice Recognition Service - given an audio file it returns *an Incident Type object* after analyzing the recording
- Authentication Service –given a username and password, it returns a true/false value indicating whether system access is granted

Question 1 (Create A Service Request Scenario) – 10 marks

Create an **object level sequence diagram** for the following scenario.

Precondition: First Responder has permission to access system

Actor (First Responder)	**System**
Starts call. Submit GPS coordinates (40.756427, 74.270053) and audio file (dispatch.mp3).	Get address by submitting GPS coordinates to Location service. Get incident type by submitting audio file to Voice Recognition service Get current date (assume this is available locally in the Domain Controller) Create and store new incident. Initialize with address, incident type, a status of "open" and current date Display address, incident type and current date

Question 2 (Dispatch Ambulance Scenario) – 10 marks

Create an **object level sequence diagram** for the following scenario.

Precondition:

Actor (Dispatch)	**System**
Enters employee number "112" and password "pass" and requests to view open incidents.	Authenticates user using service. Display all open incidents for dispatcher
Chooses an incident	Display all details related to incident

Find available ambulances	Get Service Area using the incident address. Return all ambulances "not in use" for that Service Area
Dispatch a selected ambulance	Set selected ambulance to "in use" Set incident status to "in process" Increment ambulance's station numOfVehicles counter Saves the station, incident and ambulance status

Question 3 (Add a Patient Scenario) – 25 marks

a) Create an **activity diagram** for the following scenario. Parallelize where possible. Use *swimlanes* to create your diagram [15 marks]

b) Create an **object level sequence diagram** for the scenario. [10 marks]

Precondition: has permission to access system

Actor (Dispatcher)	**System**
Enters employee number "112" and password "pass" and requests to view related incidents.	Authenticates user using service. **If authentication is successful** Display all open incidents that the dispatcher is responsible for **Otherwise** Terminate immediately
Select an incident	Displays information related to incident
Enter patient name, address	Get current time Store patient data Display confirmation to the user
Loop through previous steps until user is complete	

Question 4 (Ambulance Statechart Diagram - 15 marks)

Given the following description, create a statechart diagram for the ambulance entity class. In this diagram, add an annotation (note) that lists the business rules about the ambulance which can be inferred from the diagram.

Before an ambulance is placed into service, it must pass a safety test. If it passes, it is made available to be dispatched. If it fails, it is sent to be serviced. This process continues until the test is passed.

Once it is made available, it can be assigned to an incident by a dispatcher. Dispatcher typically assign unused but available ambulances to an incident. An assigned ambulance is released (made available) again only when the incident is closed or a replacement ambulance is assigned. Routine maintenance is done on each ambulance after every 30000 km of service. After maintenance is complete, it must be retested for safety. The ambulance is not made available again until is passes.

When the ambulance is discarded, it remains in the system for historical purposes (ie statistical queries)