

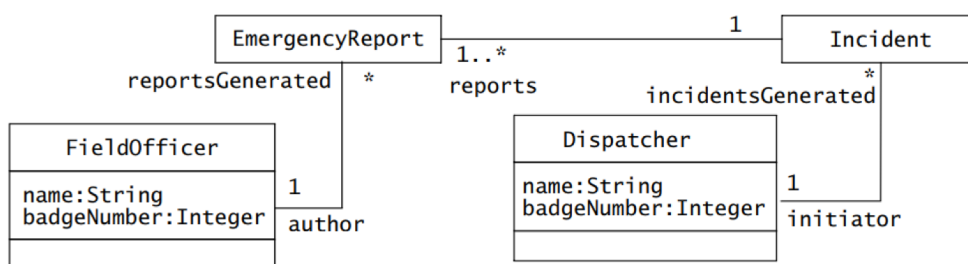
Week 5: Class Models

Submit: your answers for this workshop via the LMS or csubmit by 8pm Wednesday 25 March 2020. The workshop will be assessed using the CITS4401 workshop assessment rubric which can be downloaded from the unit web page at <http://teaching.csse.uwa.edu.au/units/CITS4401>. If you use csubmit please put all your answers into a single file saved as a pdf.

Reading: Fowler UML Distilled Chapter 3 (class diagrams)
Pressman Chapter 8 (Requirements Modelling)

Questions

1. Reading UML class diagrams



Use English sentences to explain the model that is described by the UML class diagram above. State any assumptions you make.

SOLUTION:

Every incident results in one or more Emergency Reports.
A field officer generates 0, 1 or more Emergency reports.
One or more reports are generated for an incident.
A dispatcher initiates any number (0,1 or more) incidents.
A field officer is identified by a name and badge number ID.
A dispatcher is also identified by a name and badge number ID

You can read more about this system in Bruegge and Dutoit:

<i>Scenario name</i>	<u>warehouseOnFire</u>
<i>Participating actor instances</i>	<u>bob, alice:FieldOfficer</u> <u>john:Dispatcher</u>
<i>Flow of events</i>	<ol style="list-style-type: none"> 1. Bob, driving down main street in his patrol car, notices smoke coming out of a warehouse. His partner, Alice, activates the “Report Emergency” function from her FRIEND laptop. 2. Alice enters the address of the building, a brief description of its location (i.e., northwest corner), and an emergency level. In addition to a fire unit, she requests several paramedic units on the scene given that area appears to be relatively busy. She confirms her input and waits for an acknowledgment. 3. John, the Dispatcher, is alerted to the emergency by a beep of his workstation. He reviews the information submitted by Alice and acknowledges the report. He allocates a fire unit and two paramedic units to the Incident site and sends their estimated arrival time (ETA) to Alice. 4. Alice receives the acknowledgment and the ETA.

Note: This example does not have arrows on the associations - but they would be helpful. See the video feedback *week 5 UML class diagram worked example* in Echo360 for additional feedback.

Questions 2, 3 and 4 relate to a project for the University of Titipu. The University have decided to develop a web-based maintenance tracking and repair system (TUTRS). [Source: based on Pressman Ch 8 Question 8.3]

Staff and students can log onto a website and report the location and severity of broken equipment or other maintenance issues. As issues are reported they are logged within a University maintenance database and assigned an identifying number, location, problem description and photograph, and repair urgency. Work order data are associated with each reported issue and include the problem, repair crew, number of people, equipment assigned, hours applied, status of repair, material used in the repair, and repair cost (computed from hours, number of people, material and equipment). Finally a damage file is created to hold information about the reported damage from the maintenance problem, including the reporting person, their contact details, type of damage and \$ amount of damage. TUTRS is an online system. All queries are to be made interactively.

2. **Discovering UML classes** List potential *actors* and the *classes* for TUTRS. Use the noun-verb method or CRC cards or any other heuristics you wish.

SOLUTION:

Potential Actors:

Staff and students (people)
website (system)
maintenance staff

Potential Classes:

person (staff or student who reports issue, or repair crew member who performs work order) issues (broken equipment or other maintenance issues)
number, location, description, photo, urgency (of an issue)
work order
attributes of the work order: repair crew etc damage file (record of the repair)

3. Now identify potential associations from the *verbs* in this scenario. You may wish to use the CRC method to identify relations between the classes. Decide on the multiplicity of the associations, giving reasons for your answers.

SOLUTION: See the video feedback *week 5 UML class diagram worked example* in Echo360 for sample solutions to this question.

4. Draw a *UML class diagram* for the TUTRS system to capture the classes and attributes you identified in the previous questions.

SOLUTION: See the video feedback *week 5 UML class diagram worked example* in Echo360 for sample solutions to this question.