CS 213 – Spring 2016

Lecture 15 – Mar 8
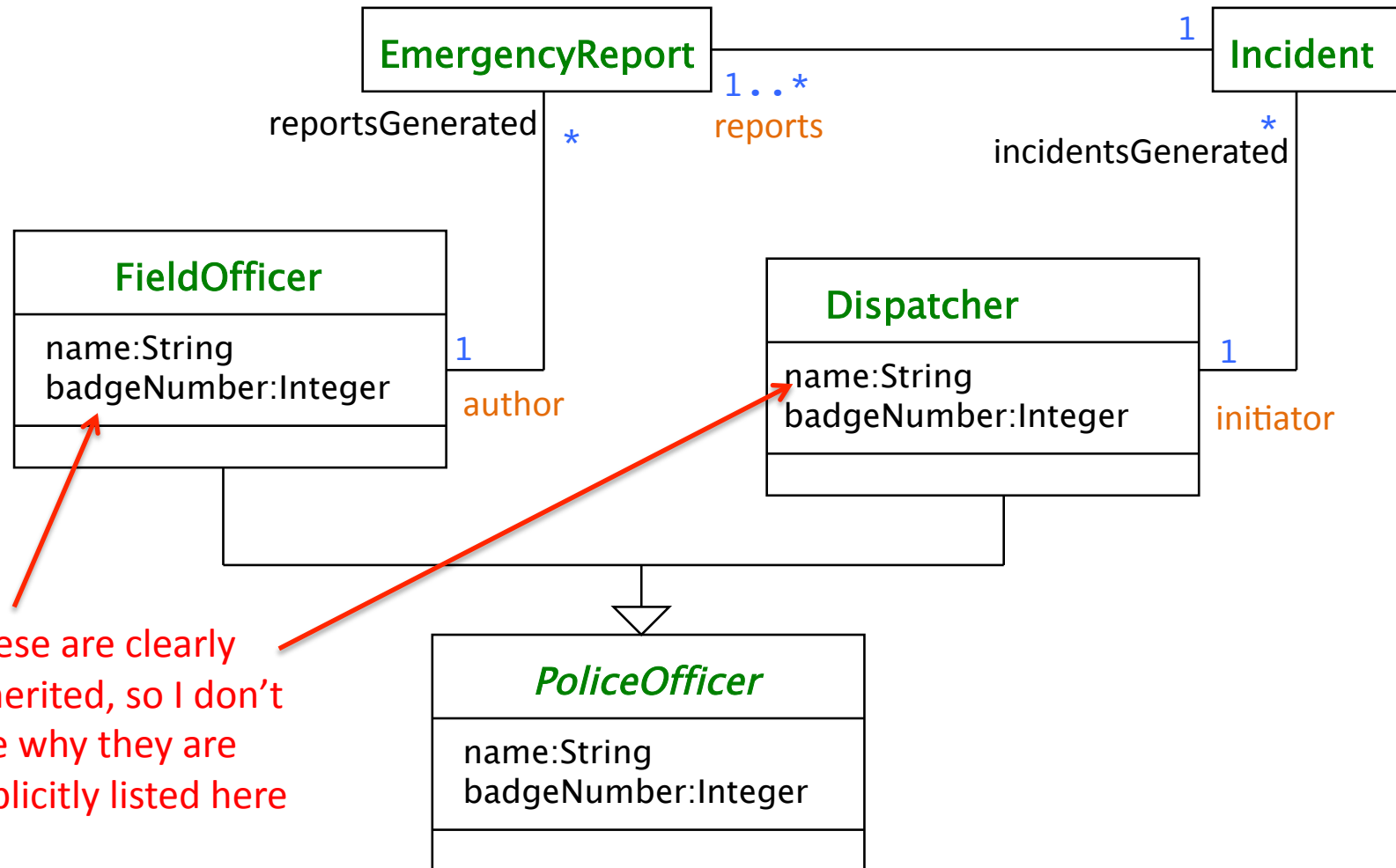
UML Class Diagram - IV

Modeling Police Incidents

Draw a UML Class Diagram to model the handling of incidents by the dispatchers and field officers of a police department. Dispatchers log incidents, and field officers write emergency reports, as many as each incident requires.

Abstract Class/Inheritance/Bidirectional Association

From "Object-Oriented Software Engineering" 2nd ed. by Bruegge and Dutoit

EmergencyReport

Incident

reportsGenerated 1..* reports
incidentsGenerated

FieldOfficer

name:String
badgeNumber:Integer

author

Dispatcher

name:String
badgeNumber:Integer

initiator

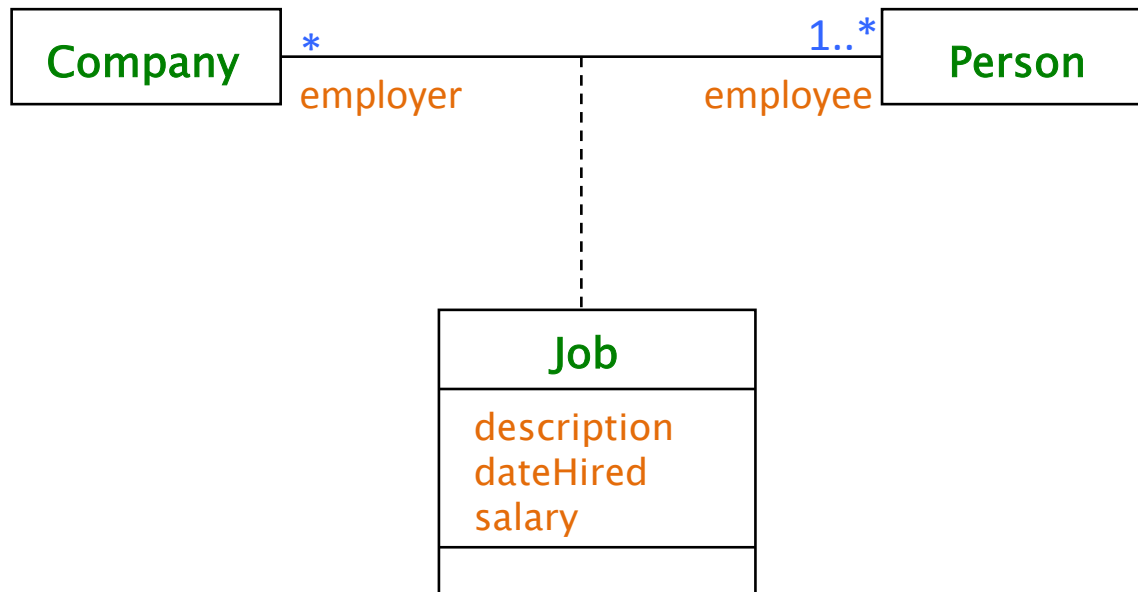*PoliceOfficer*

name:String
badgeNumber:Integer

These are clearly inherited, so I don't see why they are explicitly listed here

Association Class

- At times, an association between two classes itself has properties - an **association class** is used to model these properties.
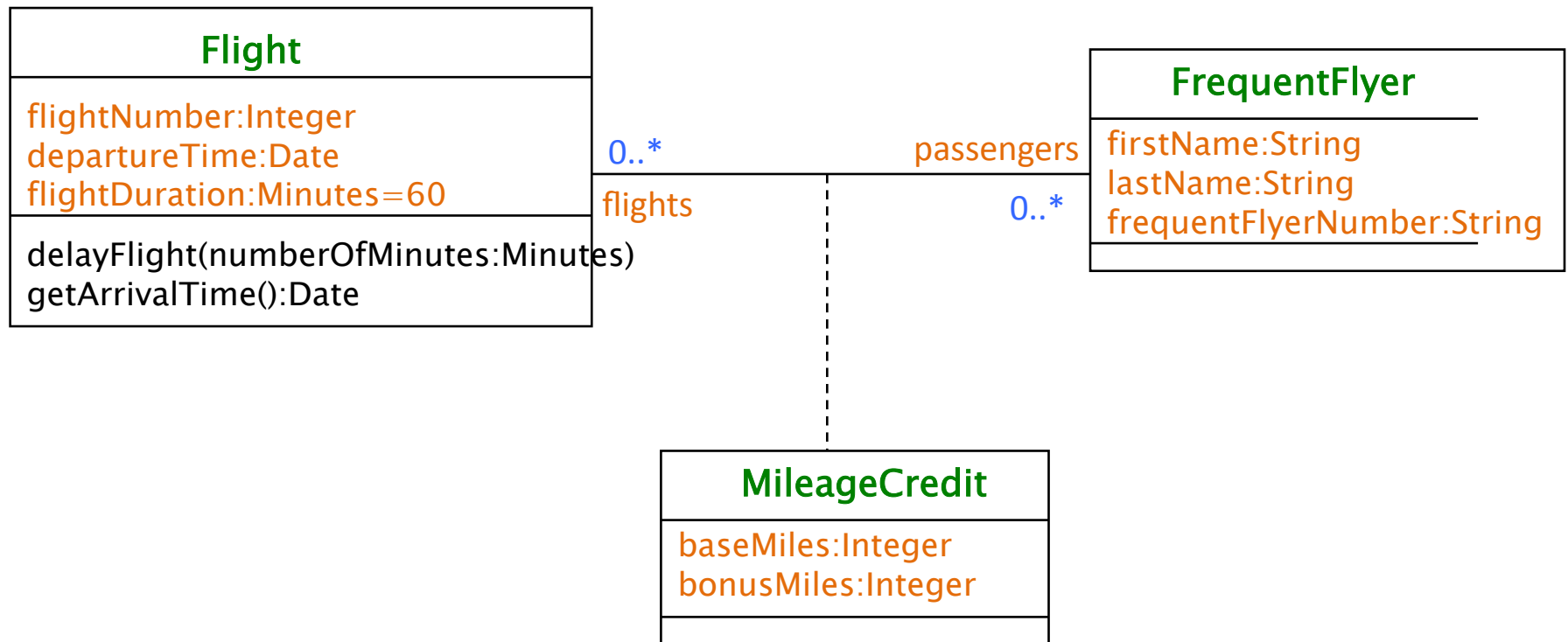
From "The Unified Modeling Language User Guide" by Booch, Rumbaugh, and Jacobson

```
┌──────────────┐  *                    1..* ┌──────────┐
│   Company    │─────────────┬─────────────│  Person  │
└──────────────┘  employer   ┊   employee  └──────────┘
                             ┊
                             ┊
                    ┌────────────────┐
                    │      Job       │
                    ├────────────────┤
                    │ description    │
                    │ dateHired      │
                    │ salary         │
                    ├────────────────┤
                    │                │
                    └────────────────┘
```
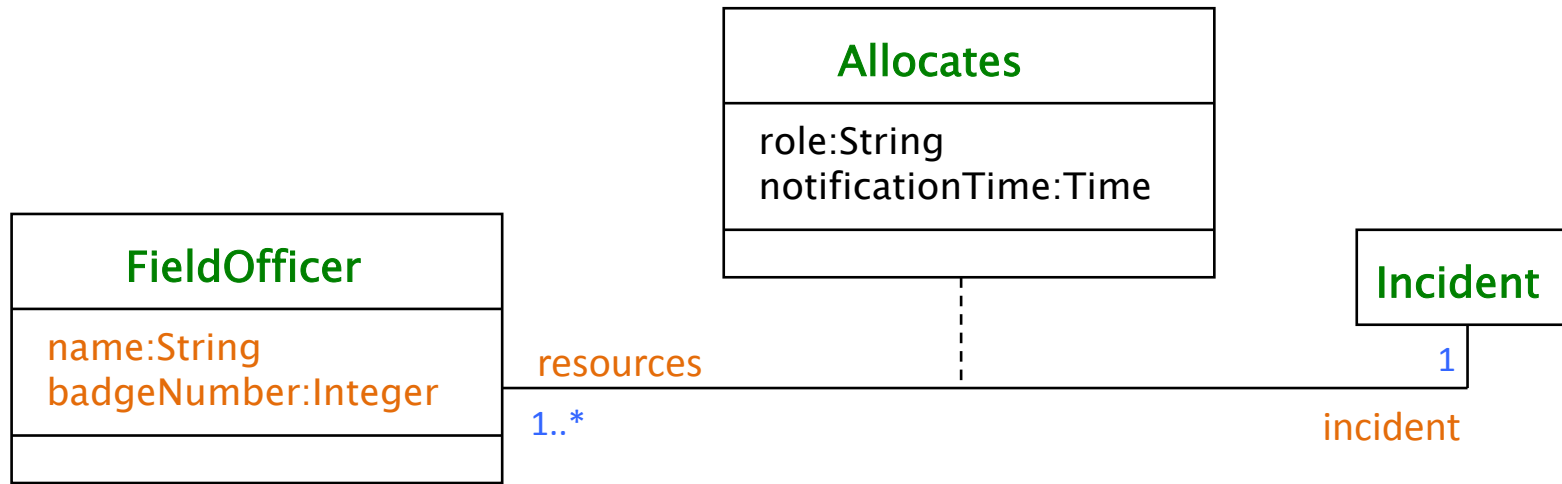
Association Class: Example

From "UML basics: The class diagram" by Donald Bell

http://www.ibm.com/developerworks/rational/library/content/RationalEdge/sep04/bell/

Flight

flightNumber:Integer
departureTime:Date
flightDuration:Minutes=60

delayFlight(numberOfMinutes:Minutes)
getArrivalTime():Date

0..*
flights

passengers
0..*

FrequentFlyer

firstName:String
lastName:String
frequentFlyerNumber:String

MileageCredit

baseMiles:Integer
bonusMiles:Integer

Association Class: Example
From "Object-Oriented Software Engineering" 2nd ed. by Bruegge and Dutoit

Allocates

role:String
notificationTime:Time

FieldOfficer

name:String
badgeNumber:Integer

resources

1..*

Incident

1

incident

Is this equivalent to the above?

Allocates

role:String
notificationTime:Time

1

1

FieldOfficer

name:String
badgeNumber:Integer

1..*   resources

incident   1

Incident