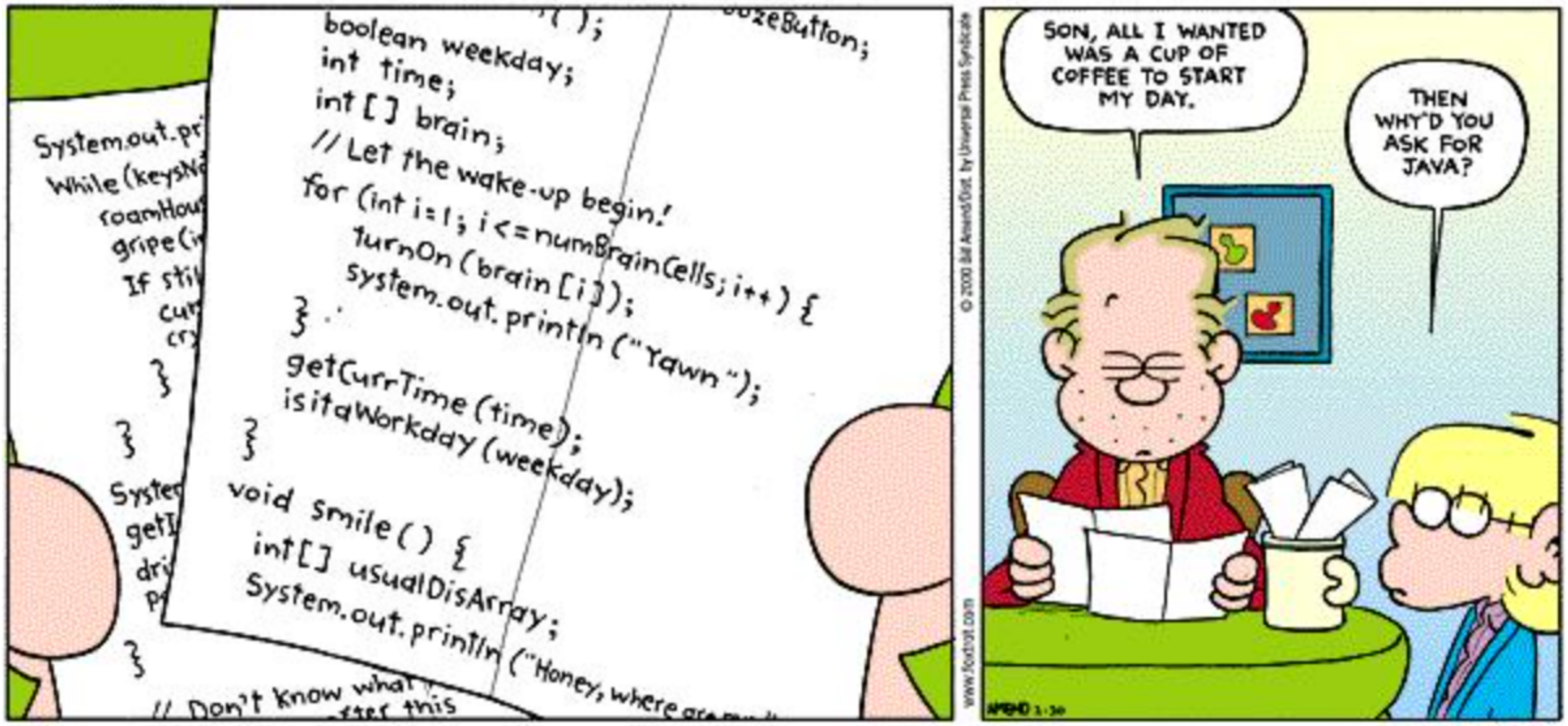

```
System.out.pr
While (keysN
roamHou
gripe(i
If sti
cur
cry
}
}
Syste
getI
dri
p
}
// Don't know what
fter this
```

```
()();                    ozeButton;
boolean weekday;
int time;
int [] brain;
// Let the wake-up begin!
for (int i=1; i<=numBrainCells; i++) {
  turnOn (brain [i]);
  System.out.println ("Yawn");
}
getCurrTime (time);
isitaWorkday (weekday);
}
void smile() {
  int[] usualDisArray;
  System.out.println ("Honey, where are m
```

SON, ALL I WANTED WAS A CUP OF COFFEE TO START MY DAY.
THEN WHY'D YOU ASK FOR JAVA?
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www.foxtrot.com
AMEND 2-20

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Updated Use Case Diagram

- Mostly done well.
- Some Use Case Diagrams still model sub use cases rather than comprehensive business use cases
- Important to get this right for Deliverable #6
- Ask your TA about this if you did not get 10/10 on level of detail

Activity Diagram

- Mostly done well
- Modelling design or specifications rather than requirements or the Work. References to vocabulary about System:
  - references to database, Web page, clicks, taps, buttons, device, App, field, etc.
- Missing swimlanes or activities from secondary actors

Process Model

- Process model represents a single function rather than a comprehensive use case
- Modelling design or specifications rather than requirements or the Work. References to vocabulary about System

Scenarios

- Headers missing information
  - Triggers, preconditions not used correctly
- Alternatives should only be alternative desired behaviour
- Exceptions should only be desired recovery from bad events, inputs, situations
- Modelling design or specifications rather than requirements or the Work. References to vocabulary about System
- Some scenarios may need to be merged, to represent the scenarios of a comprehensive use case.
  - Important to get this right for Deliverable #6
  - Ask your TA if you did not get 10/10 for level of detail on the Use Case Model
- Inconsistent number of steps

Atomic Requirements

- Just need one primary atomic requirement per sub scenario step
- Important to get this right for Deliverable #6

Deliverable #6

100-Dollar Prioritization of comprehensive Use Cases

- with respect to importance/value
- by 4 stakeholders, 3 not on your team

Kano Prioritization of sub-scenarios (main scenario, alternatives, and exceptions) of the two highest-priority comprehensive Use Cases

- with respect to importance/value
- by 4 stakeholders, 3 not on your team

100-Dollar Prioritization of primary Atomic Requirements of the highest-priority sub-scenarios

- with respect to relative importance/value
- by 2 stakeholders not on your team

AHP Prioritization of primary Atomic Requirements of the highest-priority sub-scenarios

- with respect to relative difficulty to implement
- by all members your team

Plot relative value / relative difficulty of primary Atomic Requirements

SE463

Software Requirements Specification & Analysis

Specifications

Objective

Want to articulate a software specification that meets the stakeholders' requirements

Refresh:

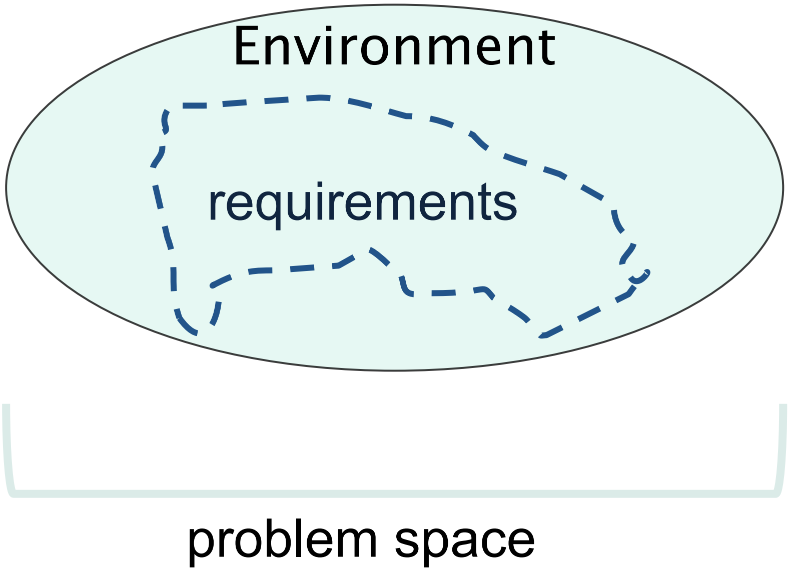
- Requirements - Conditions and capabilities that describe a *problem* – to be met by a *solution*, for the solution to be acceptable

- Specification - A complete, precise, verifiable expression of requirements of a *software* or *system* solution.

Refresh: Requirements

A requirement is a condition or capability that must be achieved

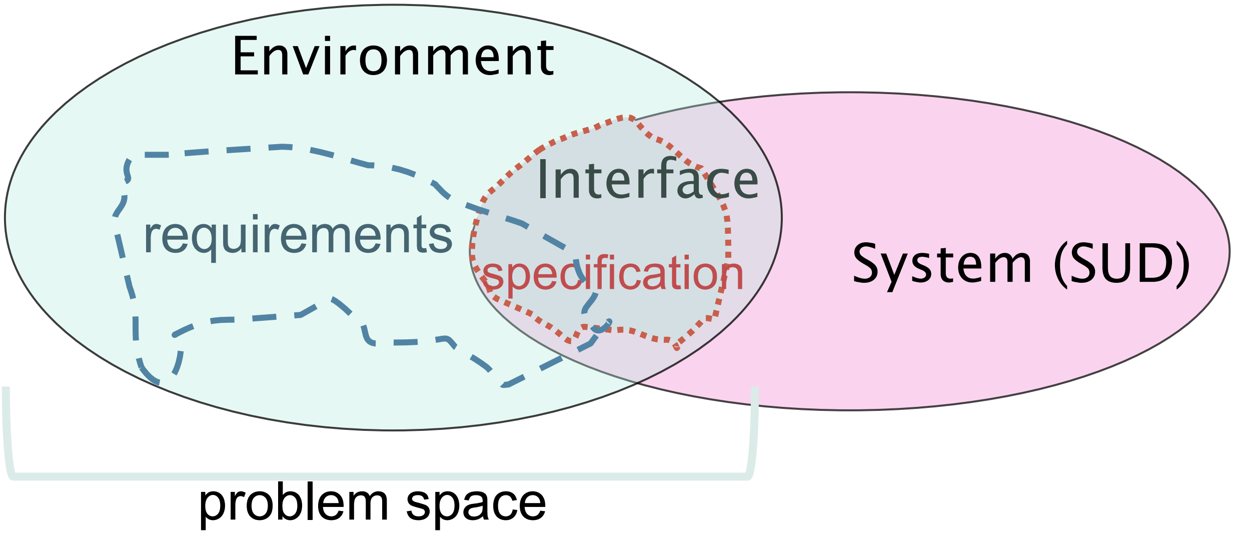
- desired changes to the World
- expressed in terms of environmental phenomena



Refresh: Specification

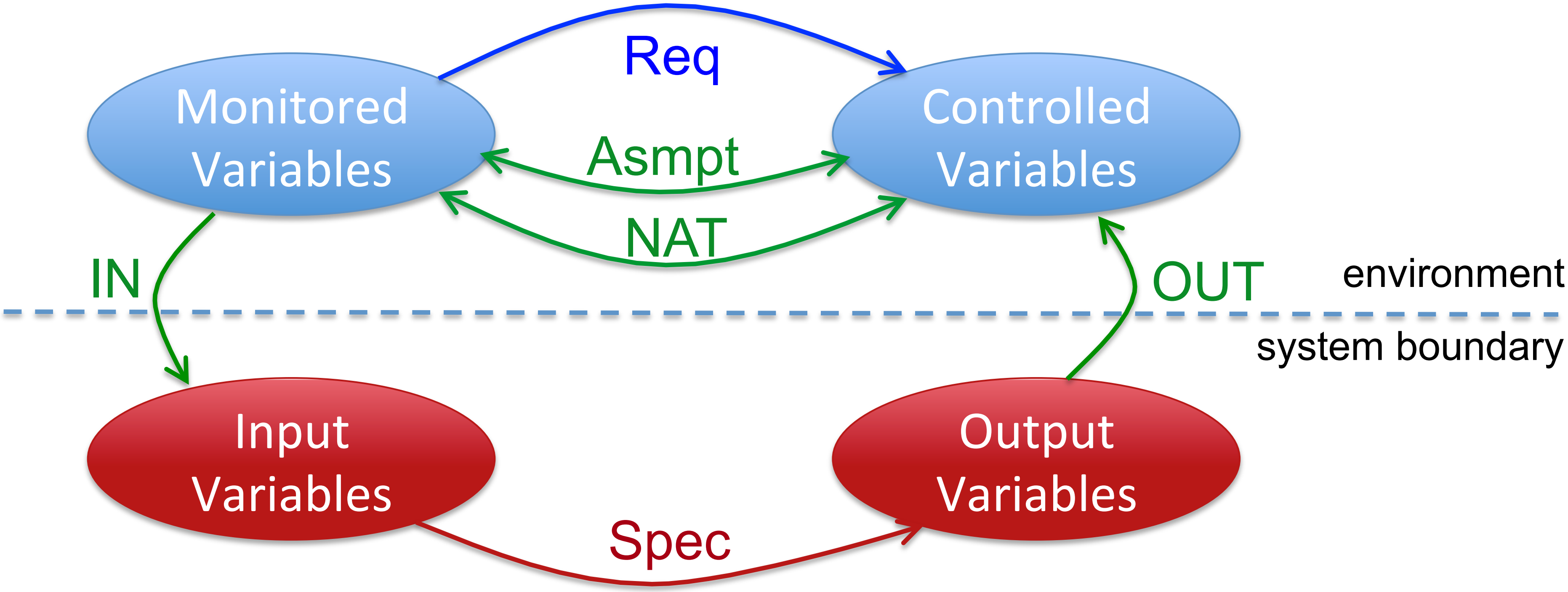
A specification is a description of the proposed software system

- system boundary is identified
  - with respect to what requirements it will implement
  - input data (from sensors, input devices)
  - output data or commands (to actuators, output devices)
- re-expresses requirements in terms of interface phenomena
- places no constraints on the design or implementation of the system giving the designer maximum freedom



Requirements Vs. Specifications

Another way of seeing the distinction between requirements and specifications is by viewing them through the 4-variable model:

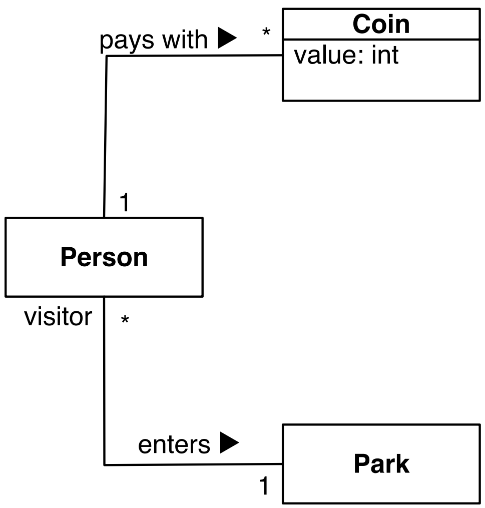


Spec ∧ Dom ⊨ Req

Dom = Asmpt ∧ NAT ∧ IN ∧ OUT

Example: Park User Fees

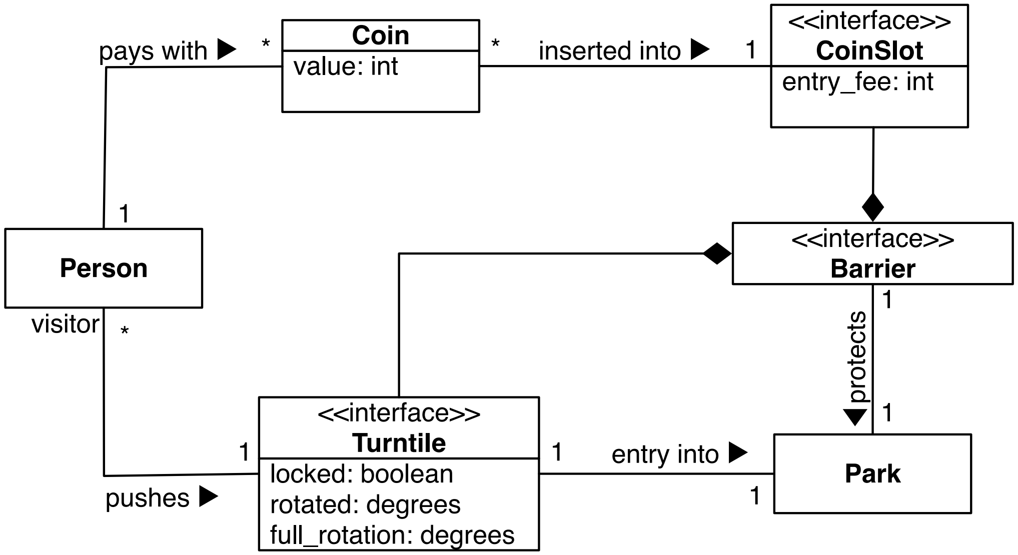
Requirements



Collect $1 from each visitor on entry to the park

Ensure that anyone who has paid can enter the park

Specifications



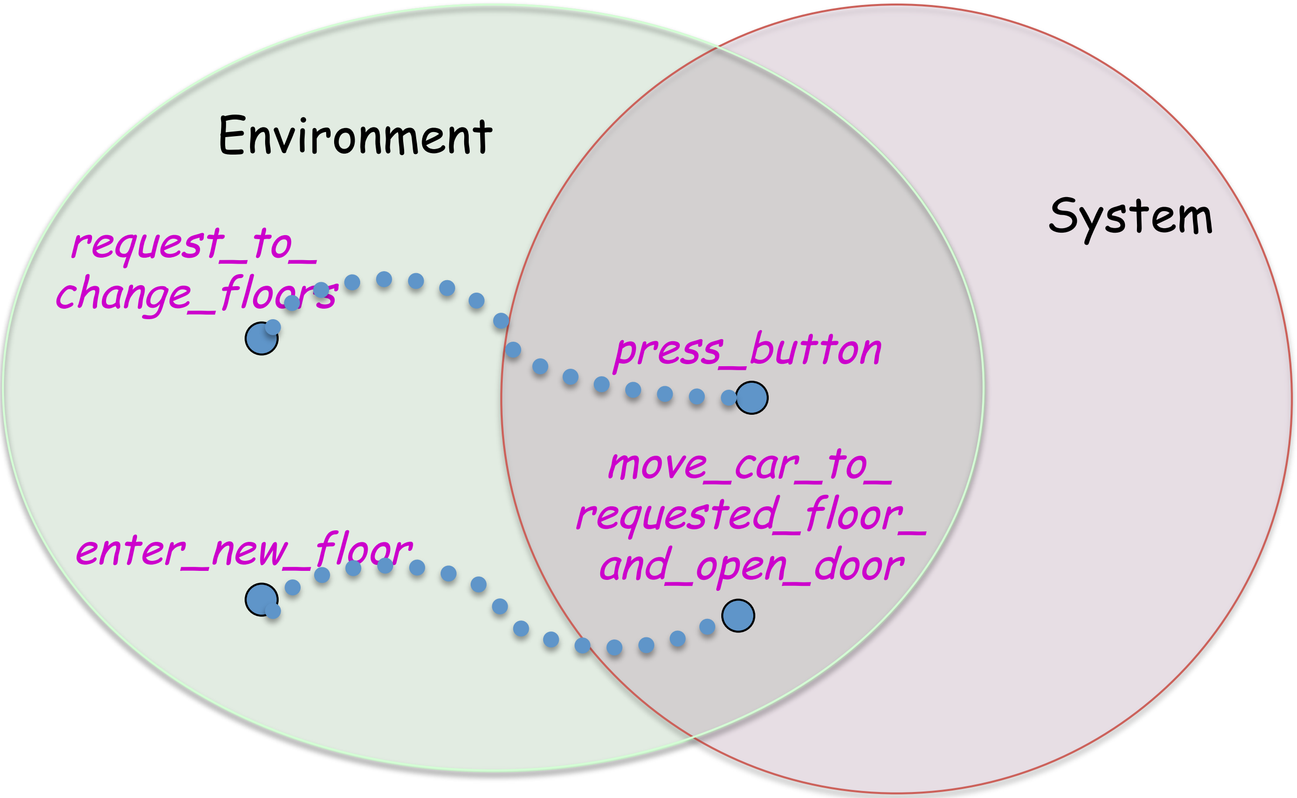
Collect $1 in the CoinSlot for every rotation of the Turnstile

Whenever the CoinSlot receives $1, unlock the Turnstile

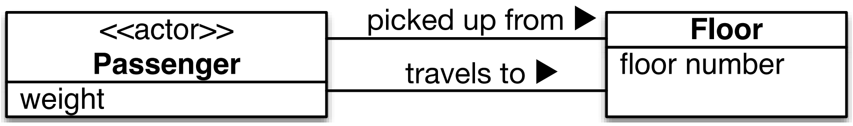
Cyber-Physical Systems

Interface entities are likely to be interface devices (sensors and actuators), sensor readings, and actuator commands

Example: Elevator



Example: Elevator


<<actor>>
Passenger
weight

picked up from ▶

travels to ▶

Floor
floor number

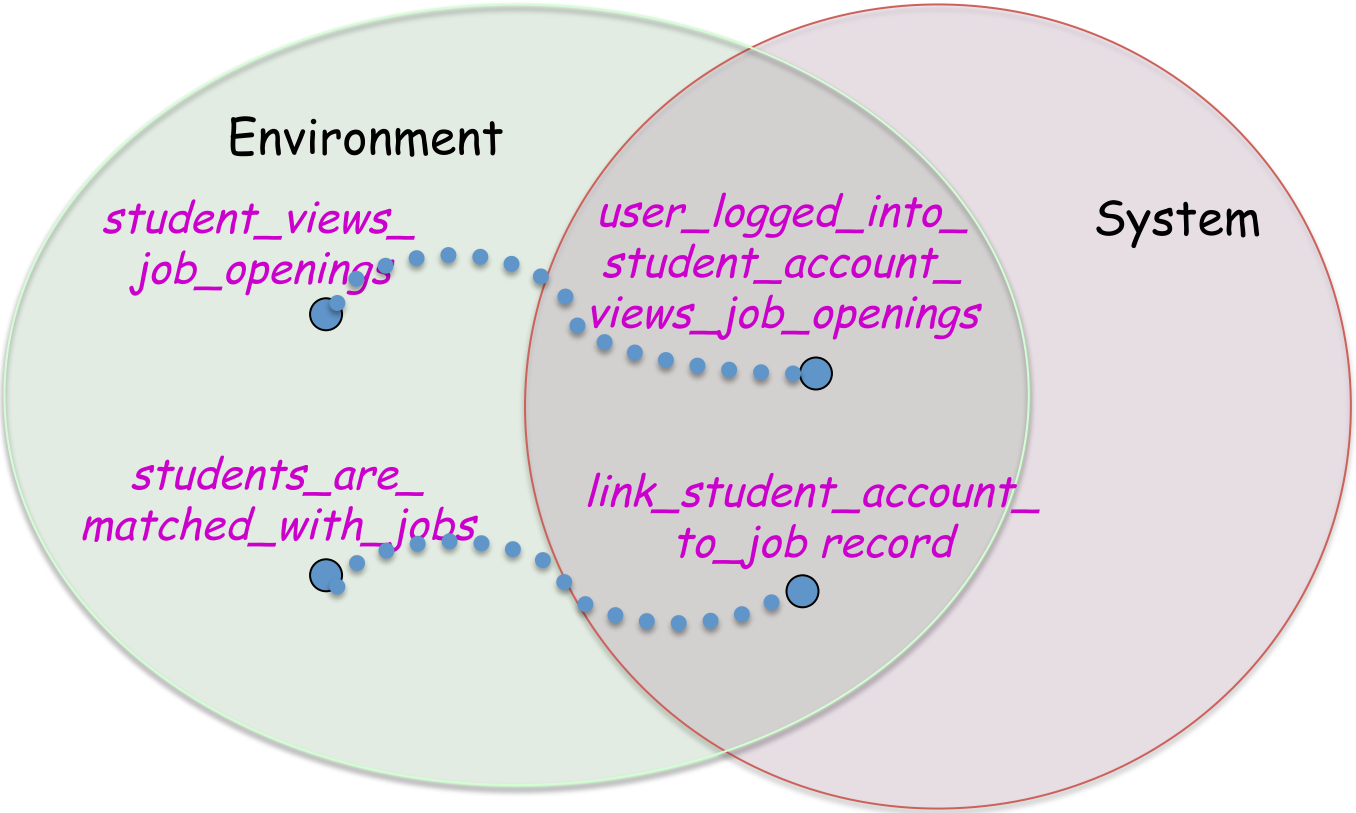
Req: Passenger is transported from her current floor to a designated floor

Cyber Systems

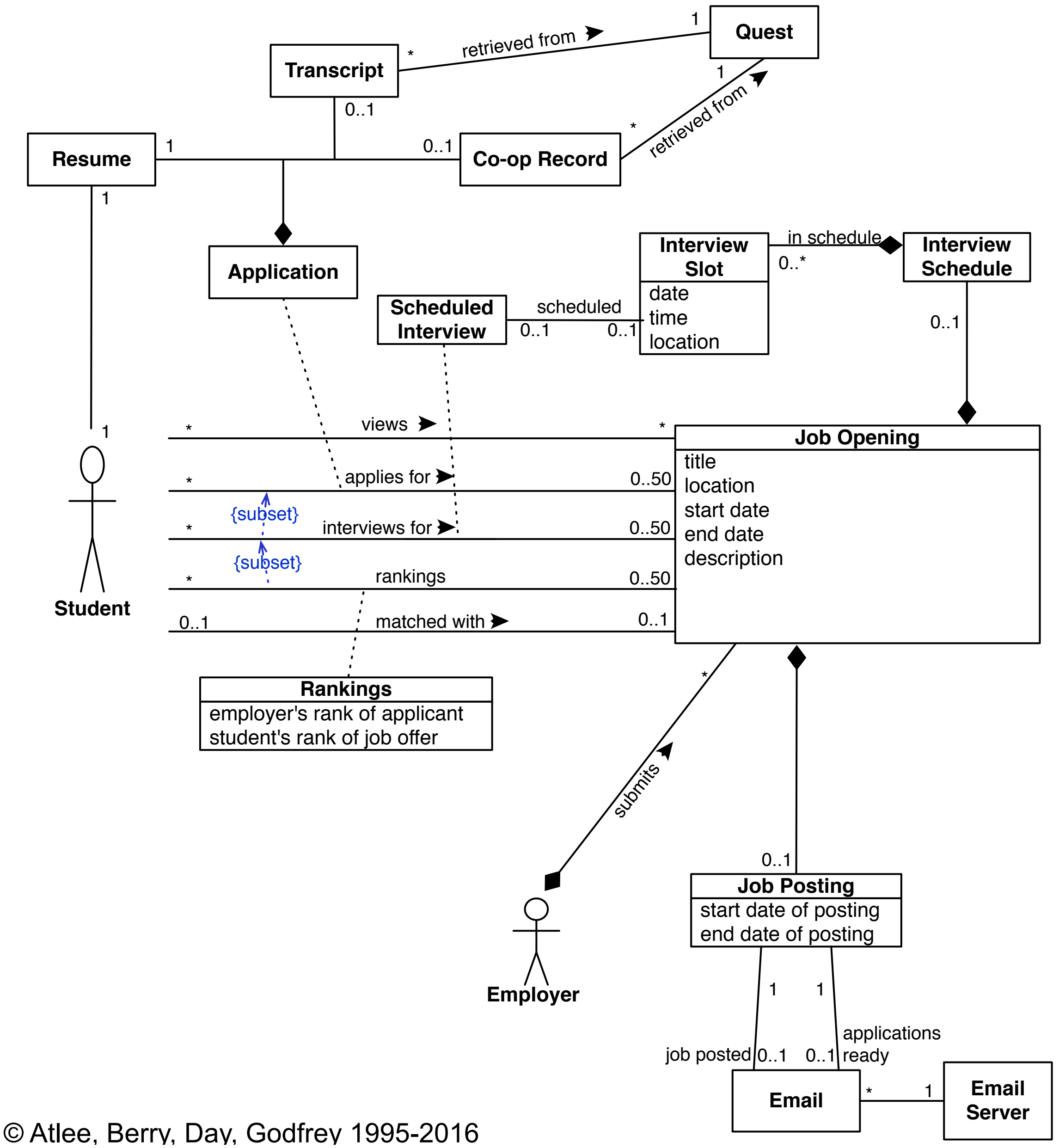
Interface entities are likely to be cyber entities:

- Accounts, user ids, passwords, records, record ids, Web forms, keystrokes, mouse clicks, screen displays, popup messages

Example: JobMine



Example: JobMine



R1: Student views Job Openings

R2: Product will match Students with Job Openings

Summary

Requirements vs. Specifications

- Impact on Domain Model
- Impact on vocabulary used in models, scenarios, atomic requirements
- Spec, Dom $\models$ Req

Deliverable #7

Updated Domain Models

- one for requirements descriptions (environment phenomena)
- one for specification descriptions (environment + interface pheno.)

Detailed Atomic Requirements

- conditions of satisfaction for N highest-priority primary atomic requirements
- expressed using environment phenomena

Detailed Atomic Specifications and Assumptions

- conditions of satisfaction for N highest-priority primary atomic requirements
- expressed using interface phenomena
- assumptions about environment phenomena, actors, input/output devices
    - needed to guarantee that a system meeting the specification will also meet the requirements