CSE1720

Week 08, **Class Meeting 20** (Lecture 17)
COLLECTIONS EXERCISES

Click to edit Master text styles
Second level
Third level
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Fifth level

Winter 2013 ◆ Thursday, Feb 28, 2013

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Instructions

- For each of the following design scenarios, state which *parameterized* type from the Collections framework is most appropriate and why.
  - For instance, if your answer is `Set<String>`, state why you chose `Set` for the collection and why you chose `String` for the elements of the collection.
- If you think there is more than one correct answer, then make a decision, state your assumptions and describe the considerations in making your choice.

Instructions

- The possible choices are:
  - `Set<E>`
  - `List<E>`
  - `Map<K, V>`

where:

- `E` is the *type* of the element in the set/list, and
- `K` and `V` are the *types* of the keys and values of the map, respectively.

For the types `E`, `K`, and `V`, you may name class definitions that were used in the course or invent new class names.

Design Scenario #1

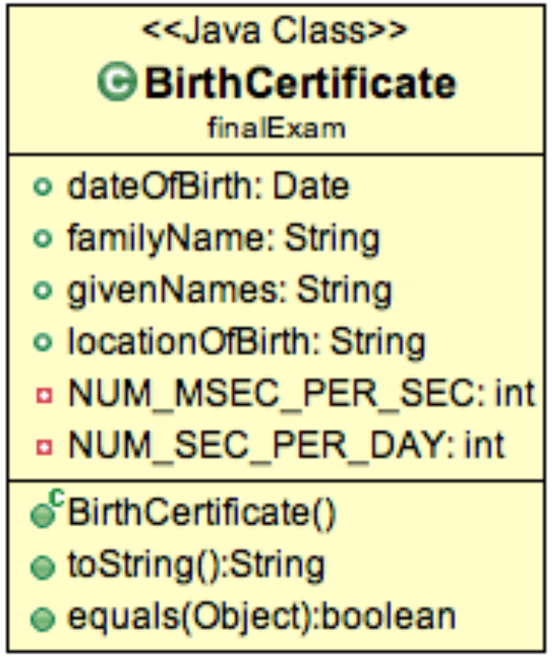
- Goal: represent all of the songs a particular band intends to play at their next concert.

Design Scenario #2

- Goal: record the *primary phone number* for each student in the university (which a student provides upon registration).
  - The goal in creating this collection is to provide it to a robo-calling service in order to issue a reminder message to everyone about the importance of vaccinations.
  - In order to not cause undue irritation, there should only be one robo-call per number.

Design Scenario #3

- Goal: record the birth information of all of the students presently enrolled at York university.
  - You may use the services of the `BirthCertificate` class, which is shown in the UML diagram below.



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Design Scenario #4

- Goal: for every family name that is found among the students at York, record for each family name the birth certificate of the oldest student at York who has that family name.
  - You may use the `BirthCertificate` class from the previous Design Scenario

Design Scenario #5

- Goal: record, for each day of the calendar, the number of people whose birthdate falls on that day.
  - You may use the `BirthCertificate` class from the previous Design Scenario
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Design Scenario #6

- Goal: represent all of the credit cards that are held by all of the students in the university.
  - The goal in creating this collection is so that the total actual debt and potential debt of the entire student population can be determined.
  - Assume for the moment that all privacy laws have been suspended.

Design Scenario #7

- Goal: record all observations about the vehicles that drove west on Steeles between 9am and 10pm today between Keele and Jane.
  - The goal in creating this collection is so that it can be analyzed with respect to proportion of high-occupancy vehicles (more than three passengers) and low-occupancy vehicles (2 or fewer passengers).
- Assume the class `VehicleObservation` is defined to encapsulate all of the attributes about a particular observation that was made of a particular vehicle (e.g., its license plate, its speed, the time and intersection of entering Steeles, the time and intersection of leaving Steeles).

Design Scenario #8

- Goal: Building on design scenario X, we wanted to create a lookup table so that, for any vehicle license plate, we can check the number of times it was observed travelling west on Steeles between Keele and Jane.

Design Scenario #9

- Goal: Building on design scenario X, suppose we wanted to create a lookup table so that for any vehicle license plate, we could determine all of its vehicle observations on Steeles between Keele and Jane.