Review

- What is composition?
- When the member object initialized?
- Which constructor is used to initialize the member object if we don’t do anything special?
- How to initialize the member object with a particular constructor.
Arrays of objects
Arrays review

- An array is an indexed collection of data elements of the same type.
  ```
  int aaa[10];
  ```
  - 10 elements of the int type. Each array position is a single element
  - What is the range of the index?
  - What are the 10 elements?
Declaring arrays of objects

- Declaring arrays of objects is similar to declaring arrays of built-in types
  
  Fraction rationals[20]; // array of 20 Fraction objects
  Complex nums[50]; // an array of 50 Complex objects
  Hydrant fireplugs[10]; // an array of 10 fireplugs

- Each array position is a single object
  
  ‘Fraction rationals[20];’ declares 20 Fraction objects, rationals[0], rationals[1], …, rationals[19].
Initializing the array of objects

- Similar to a number array declaration.
  - Do nothing to use the default constructor
    ```
    int x;
    Fraction num;
    Fraction num[4];
    ```
  - To initialize in a particular way, call an explicit constructor
    ```
    Int x(10);
    Fraction num(10, 20);
    ```
  - How to do array of objects? Need a way to specify different constructors to different elements.
To initialize in a particular way, call an explicit constructor

```
Int x(10);
Fraction num(10, 20);
```

How to do array of objects? Need a way to specify different constructors to different elements.

- Use an initializer set to give a constructor to each element

```
Fraction numlist[3] = {Fraction(2, 4), Fraction(5), Fraction()};
```

- numlist[0] is initialized with constructor Fraction(2,4);
- numlist[1] is initialized with constructor Fraction(5);
- numlist[2] is initialized with constructor Fraction();
Using the array of objects

- Indexing works the same as with regular arrays
  - Each object in the array is in the form of `arrayName[index];`
- The dot-operator works the same as with single names.
  
  `objectName.memberName`
- The `objectName` is in the form of an array item:
  
  `arrayName[index].memberName`

- Example

  ```java
  Fraction rations[20];
  ...
  rations[2].show();
  rations[6].Input();
  for (i=0; i<10; i++) rations[i].setval(20);
  for(i=0; i<20; i++) rations[i].pubval = 50;
  ```