Review of CS1

First things first

- Anyone not here yesterday?
- LDAP database
  - Is your e-mail correct?
  - We'll see after this class!

Plan for this class

- Quickly review some things from CS1
  - Ease you back into Java.
- The votes are in…

Question 1

- A package is
  - A collection of related classes.
  - A collection of related variables.
  - A collection of related constants.
  - Something delivered by UPS.

Question 1: Packages

- A related set of classes

```
import java.util.Math;
import java.io.*;
```

Question 1: Packages

- To create a package

```
package foo;
```

Question 2

- Given the following piece of code -- what will be printed out?
  - 1
  - 2
  - 3
  - 42

Question 2

```
class Scope
{
    public int theVar = 1;

    public void printMe (int theVar)
    {
        System.out.println (theVar);
    }

    public static void main (String args[])
    {
        int theVar = 2;
        Scope S = new Scope();
        S.printMe (theVar + 1);
    }
}
```

Question 2: Scope

- Scope indicates the region of a program where a variable is seen / usable.

Question 2

```
class Scope
{
    public int theVar = 1;

    public static printMe (int theVar)
    {
        System.out.println (theVar);
    }

    public static void main (String args[])
    {
        int theVar = 2;
        Scope S = new Scope();
        S.printMe (theVar + 1);
    }
}
```

Class scope

Block scope

Question 3

- What about for this piece of code?
  - 1
  - 2
  - 3
  - 42

Question 3

```
class Scope
{
    public int theVar = 1;

    public void printMe (int theVar)
    {
        System.out.println (this.theVar);
    }

    public static void main (String args[])
    {
        int theVar = 2;
        Scope S = new Scope();
        S.printMe (theVar + 1);
    }
}
```

Question 3: this

```
class Scope
{
    public int theVar = 1;

    public void printMe (int theVar)
    {
        System.out.println (this.theVar);
    }

    public static void main (String args[])
    {
        int theVar = 2;
        Scope S = new Scope();
        S.printMe (theVar + 1);
    }
}
```

Explicit reference to class variable

Question 3: this

```
class FooManager
{
...
   public void manageMe (Foo F) { ... }
}


class Foo
{
    Foo (FooManager M) { M.manageMe (this); }
}
```

Question 4

- In the following 2D array -- what is the value given by `myArray[2][1]`
  - 32
  - 45
  - 107
  - 21

Question 4

myArray

34	45	67
32	21	16
92	107	76
22	11	33

Question 4: Multidimensional Arrays

	Col 0	Col 1	Col 2
Row 0	34	45	67
Row 1	32	21	16
Row 2	92	107	76
Row 3	22	11	33

myArray[2][1] – row2, col1

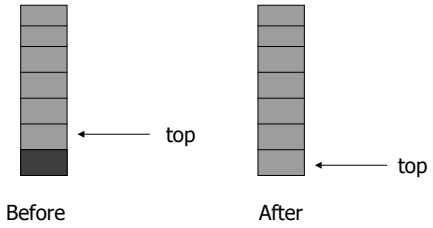
Question 4: Multidimensional Arrays

- Uses for multidimensional arrays
  - Tables
  - Spreadsheets
  - Images

Question 5

- Using an array implementation of a Stack (elems/top) -- what statement best describes the push(E) operation
  - `elems[top] = E`
  - `elems[--top] = E`
  - `elems[top--] = E`
  - `elems[++top] = E`

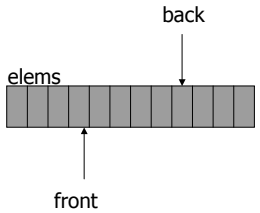
Question 5: Stack



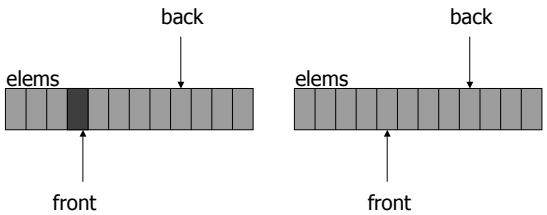
Question 6

- For the array implementation of a circular queue -- the statement that best describes the deque() operation is
  - `return elem[front]`
  - `return elem[back]`
  - `return elem[front++]`
  - `return elem[back++]`

Question 6



Question 6: Circular Queue



Really would do

```
front = (front + 1) % n
```

Question 7

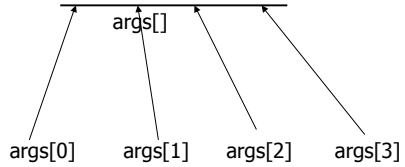
- What will be printed by the following code if the commandline `java foo one two three four` is entered
  - `one`
  - `two`
  - `three`
  - `java`

Question 7:

```
public class foo
{
   public static void main (String args[])
   {
        System.out.println (args[1]);
   }
}
```

Question 7: Commandline

- java foo one two three four



Question 8

- In what phase in the Software development life cycle does one start using Java?
  - Requirements
  - Design
  - Coding
  - Testing

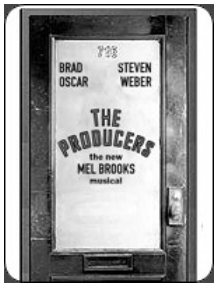
Question 8: Software Lifecycle

- Gather Requirements
  - Find out what the user needs
- System Analysis
  - Express these needs formally in system terms
- Design
  - Design a high level solution
- Implementation/Coding
  - Turn solution into code
- Testing
  - Verify that the solution works
- Maintenance
  - Iterate the cycle

Question 9

- Which class might NOT be an appropriate class for our "I Want to be a Producer" application
  - Performer
  - Actor
  - Musician
  - Audience

Question 9



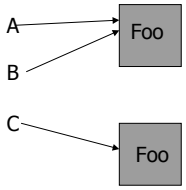
Question 10

- Say you have 2 variables of class Foo: A and B -- if you say A = B, B will refer to
  - A clone of A
  - A copy of A
  - The same object as A
  - The assignment is invalid

Question 10: clone

Foo A = new Foo();
Foo B = A;

Foo C = A.clone();



Question 11

- A class variable that can be seen outside the class is labeled as
  - public
  - private
  - protected
  - static

Question 11: access

- Most classes provide three levels of access to their members (state and behavior):
  - Public
    - The part of the class of the class that is visible to all clients of the class
  - Protected
    - The part of the class that is only visible to subclasses of the class
  - Private
    - A part of the class that is not visible to any other classes
- Static methods/members can be any of the three.

Question 12

- To push an object O on a Stack S -- one would use:
  - `S.elems[++top] = O;`
  - `S.pop(O);`
  - `S.push (O);`
  - `S.elems[--top] = O;`

Question 12: methods

- When using a class, you should always use the methods of the class first.
- Don't mess with data members (even if declared public) unless you really need to.

Question 13

- Which of the following are true: A static class method:
  - Belongs to the class and not any particular instance.
  - Can be accessed without an instantiated object of the class
  - Cannot use non-static class variables.
  - All of the above

Question 13: static method

- A static method:
  - Belongs to the class and not any particular instance.
  - Can be accessed without an instantiated object of the class
    - i.e. `Math.cos (Math.PI)`
  - Cannot use non-static class variables.
    - Otherwise it would depend upon a particular instance of the class, making it non-static.

Question 14

- To clean up the memory associated with an object -- one must
  - Call `finalize()` on the object
  - call the object's destructor
  - Call `delete()` on the object.
  - No need -- java cleans up for you.

Question 14: memory clean up

- Java provides garbage collection
  - When an object is no longer referenced, the JVM will free up the memory associated with the object.
- Not all languages provide this luxury!
  - Wait until you get to CS4!!!

Question 15

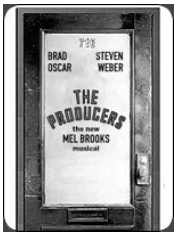
- The original name for Java was
  - Bean
  - Oak
  - PL2
  - C++ done right

Question 15

- June 1991
  - James Gosling starts work on the "Oak" interpretter, which, several years later, is renamed Java.
    - BTW, Gosling wrote one of the first versions of emacs.
  - Did you think that winning $1,000,000 would be easy?

Something to think about for next class!

- Any theatre fans in the house?



Something to think about for next class!

- "I Want to be a Producer"
  - Business manager for a theatrical production.
  - Need a simple application that allows me to determine the total amount spent on performers salaries for a given week.
  - Performers are paid a flat rate per performance given.

Something to think about for next class!

- I Want to be a Producer"
  - The app will need to:
    - Be able to accept the number of performances given by each performer
    - Calculate the salary paid for each performer
    - Determine the total salary paid for all performers
  - Think about object classes that you might develop for this simple app.

Questions?

- Any questions…
  - Tomorrow: I want to be a Producer