CSE 8B Today

PSA 5 deadline extended until Monday!

Objects, references, 
And MEMORY MODELS!

Main scope

Nim object scope

Nim constructor scope

Thank you for your feedback. 
I am reading it, and will respond 
Stay tuned...
# Exam 2

<table>
<thead>
<tr>
<th></th>
<th>Problem 1</th>
<th>Problem 2</th>
<th>Problem 3</th>
<th>Problem 4</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average (%)</strong></td>
<td>87%</td>
<td>79%</td>
<td>30%</td>
<td>89%</td>
<td>68%</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td><strong># perfect scores</strong></td>
<td>181</td>
<td>255</td>
<td>97</td>
<td>215</td>
<td>41</td>
</tr>
</tbody>
</table>
Ooof. When 90% of your students miss an exam question, it's time for a drastic change-up to the course plan. We'll get this. Hang in there, students!

Sameer Ajman, Janet Davis, Karen Thickman and 3 others like this.

Actually, just did a larger sample. Only 66% missed it. Still cause for a drastic change-up.
Exam 2: A second chance

• I will give a 1-question exam in the last 15 minutes on Friday, worth 3 points. The question will be a memory model similar to problem 3 on Monday’s exam.

• If you get the question right on Friday, these three points will be added to your Exam 2 score.

• (If you already got 3/3 on question 3, NICE JOB! But you can’t earn anymore points, so you can leave when we get to the exam.)
Today: Memory Models

• Today, we will go over problem 3, and PRACTICE WITH MEMORY MODELS

• If you got a 3/3 on question 3, you can leave if you like, but you are encouraged to stay. Either way, you will get full participation points for today.

Now, are you ready to get your exam back?
// Somewhere in a class
public static void main( String[] args )
{
    int myInt = 5;
    int[] myArray = new int[4];
    myArray[3] = myInt;
}

Draw the memory model for the code above

Every variable needs a "box"
// Somewhere in a class
public static void main( String[] args )
{
    int myInt = 5;
    int[] myArray = new int[4];
    int[] anotherArray = myArray;
    myArray[3] = myInt;
    System.out.println( anotherArray[3] );
}

Draw the memory model for the code above

What does this code print?
A. 3     B. 0     C. 5     D. “myInt”
// Somewhere in a class
public static void main( String[] args )
{
    int myInt = 5;
    int[] myArray = new int[4];
    int[] anotherArray = myArray;
    myArray[3] = myInt;
    myArray = new int[5];
    System.out.println( anotherArray[3] );
}

Draw the memory model for the code above

What does this code print?
A. 3       B. 0       C. 5       D. “myInt”
public class Nim {
    private int numPiles;
    public Nim( int piles ) { numPiles = piles; }
    public static void main( String[] args ) {
        int myInt = 5;
        Nim n = new Nim( myInt );
        System.out.println( n.numPiles );
    }
}

What does this code print?
A. “n”   B. 0   C. 5   D. “myInt”   E. There is an error
public class Nim {
    private int numPiles;
    public Nim(int piles) {
        numPiles = piles;
        piles = 3;
    }
    public static void main(String[] args) {
        int myInt = 5;
        Nim n = new Nim(myInt);
        System.out.println(n.numPiles);
    }
}

What does this code print?
A. 3       B. 0       C. 5       D. “myInt”       E. There is an error
public class Nim {
    private int numPiles;
    public Nim(int numPiles) {
        numPiles = numPiles;
    }
    public static void main(String[] args) {
        int numPiles = 5;
        Nim n = new Nim(numPiles);
        System.out.println(n.numPiles);
    }
}

What does this code print?
A. 3  B. 0  C. 5  D. “myInt”  E. There is an error

The code will print 5. The `numPiles` variable in the `main` method is initialized to 5. The `Nim` constructor then assigns this value to the `numPiles` variable of the new `Nim` object `n`. Consequently, calling `System.out.println(n.numPiles);` will print the value 5.
Classes, objects and scope

public class Nim {
    private int[] board;
    public Nim( int[] theBoard ) {
        theBoard = board;
    }
    public static void main( String[] args ) {
        int[] b = {1, 2, 3};
        Nim n = new Nim( b );
        b[2] = 5;
        System.out.println( n.board[2] );
    }
}

What does this code print?
A. 3  B. 0  C. 5  D. 2  E. There is an error
public class Nim {
    private int[] board;
    public Nim( int[] board ) {
        this.board = board;  // copies reference from constructor’s board to object’s board
        board = new int[3];
    }
    public static void main( String[] args ) {
        int[] board = {1, 2, 3};
        Nim n = new Nim( board );
        board[2] = 5;
        System.out.println( n.board[2] );
    }
}

What does this code print?
A. 3  B. 0  C. 5  D. 2  E. There is an error
public class Nim {
    private int numPiles;
    private int[] board;
    public Nim(int[] board) {
        numPiles = board.length;
        this.board = new int[numPiles];
        this.board = board;
    }
    public static void main(String[] args) {
        int[] myBoard = {1, 3, 5, 7};
        Nim n = new Nim(myBoard);
        myBoard[1] = 10;
        System.out.println(n.board[1]);
    }
}
Classes, objects and scope

```java
public class Nim {
    private int numPiles;
    private int[] board;
    public Nim( int[] board ) {
        numPiles = board.length;
        this.board = new int[numPiles];
        this.board = board;
    }
    public static void main( String[] args ) {
        int[] myBoard = {1, 3, 5, 7};
        Nim n = new Nim( myBoard );
        myBoard[1] = 10;
        System.out.println( n.board[1] );
    }
}
```

Draw the memory model for the code.

Rewrite the constructor so that the change to `myBoard` in main does not change the board stored in the `Nim` object.

(MM w/ new code, will print 3)