

IST 256 Second Exam Review
Thursday, March 24, 2011

Exam Review Topics

These topics are all covered in either the Notes documents or in the labs.

1. RadioButtons, ButtonGroup, Checkboxes: `isSelected()`, `setSelected()`, `clearSelection()`
2. Method definitions, scope keywords, return type, method name, formal parameters

```
private void computeAll(int num, double whammy)
{ <proc body> }
```
3. method calls

```
computeAll(16, 20.0);
```

(number and types of parameters must match method definition)
4. Array declarations, allocations, initializations (one-dimensional)

```
int [ ] numarray = new int [ 25 ];
String [ ] colors = { "red", "blue", "green" }
```
5. Standard loop for going over arrays and doing something to each element
6. Write program to average all the elements of an array.
7. Exceptions: what is an exception?
Give examples? `NumberFormatException`, `FileNotFoundException`
How can you tell if a method will cause an Exception?
The header has a "throws" clause
declare an exception variable: `Exception e; IOException e; . . .`
8. Methods to display exceptions

```
e.getMessage()
e.toString()
e.printStackTrace()
```
9. try/catch structures (not the finally clause); explain the execution of this structure
10. Files: Classes for files, `FileReader`, `FileWriter`, `BufferedReader`, `BufferedWriter`
declare a variable for one of these classes: `BufferedReader in;`
create an instance of the class, which "opens" the file

```
in = new BufferedReader( new FileReader("inputfile.txt");
```


close any reader or writer: `in.close()`

11. Streams and the Scanner class
 - using methods from the Scanner class to inspect and get items from the Stream
hasNext(), next(), hasNext(), nextInt(), hasNextDouble(), nextDouble()
 - declare a scanner: `Scanner sc;`
 - create a new instance: `sc = new Scanner (in);`
 - what does the method `useDelimiter()` do?
(defines the delimiters that occur between the items in the Stream)
 - Scanners also have a `close()` method

12. Standard loop to read lines of data from a file
 - suppose file has one int and one string on each line
 - `int number; String s;`
 - `while (sc.hasNext())`
 - `{ // read all items on one line from the file here`
 - `number = sc.nextInt();`
 - `s = sc.next()`
 - `// do something with number and s`
 - `}`

13. Writing to files
 - methods for `FileWriter`: `write()` and `newline()`

14. Formatting
 - converting numbers to strings with `String.valueOf()`

15. Scope of variable declarations
 - variables declared inside a method can only be used in that method
 - variables declared at the class level can be used in any method in the class

Exam given in iLMS with one sheet (2 pages or sides) of notes allowed.

No other materials

No other browser window open

No cell phones

Exam Review Problems

1. Understanding Arrays

Assume that a program has the following statements:

```
int [ ] numbers = new int[100];
for (int i=0; i < numbers.length; i++) {
    numbers [i] = i * 5;
}
System.out.println(numbers [30]);
```

What will be printed as the result of these statements?

2. Understanding Array Evaluation

Assume that a program has the following statements:

```
int [ ] values = new int[5];

for (int index=0; index < values.length; index++)
{
    if ( index == 0 )
        { values [ index ] = 10; }
    else
        { values [ index ] = values [ index - 1 ] + 2; }
}
```

After this loop executes, write down the numbers in the array *values*.

values[0]	
values[1]	
values[2]	
values[3]	
values[4]	

3. Understanding Methods

Given the following program (a Java application)

```
public class Main
{
    public static double mysteryAmount ( int number )
    {
        double amount;
        amount = (number * number ) + 2;
        return amount;
    }
    public static void main (String [] args )
    {
        double value;
        value = mysteryAmount ( 9 );
        System.out.println ( value );
    }
}
```

What will print as the result of the program?

4. Writing a method

Design and write a method called *isBigger* that will take 2 integers as parameters and return a boolean result. The method will return true if the first number is at least 100 more than the second and false otherwise.

Give an example of a call to this method:

5. Writing another method

Suppose that we have the following code that is used to compute the price of books and add in sales tax.

```
int numBooks = 5;
double pricePerBook = 20.00;
double taxRate = .08;
double bookCost;

bookCost = pricePerBook * numBooks;
bookCost = bookCost + (bookCost * taxRate);
```

Design and write a method definition that will compute the cost of any number of items at any price and with any amount of sales tax, and return the final cost of the items with tax.

Do not hand in this lab and review sheet. Keep them for your own study and preparing your notes to bring to the exam.