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)
      {   <method 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. Be able to write program to average all the elements of a numeric array and be able to write a program to find the highest (or lowest) value in a numeric array.

7. Exceptions: what is an exception?
      Give examples? NumberFormat, FileNotFound
      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(), hasNextInt(), 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 as characters 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() or by using a formatter, e.g.
df.format(), where df is declared: DecimalFormat df = new DecimalFormat("0.00");

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

16. Program:
      a) be able to describe in English the program steps to solve a problem
      b) be able to write the program in Java

Exam given in Blackboard 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 ] * 3;   }
}
```

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. Reading numbers from a file

Given a file named "grades.txt" with a list of a student's grades during their time at college, design a program to print all the grades the student got that were 2.0 or above.

The sample lines of the file listed as following:
3.2
1.9
2.4
2.8
……

Set up the program to read from the file with a Scanner. Write the standard loop to read numbers from the file and print out the ones that are grades that are greater than or equal to 2.0.

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