

WES-CS GROUP MEETING #9

Exercise 1: Practice Multiple-Choice Questions

1. What is output when the following code executes?

```
String S1 = new String("hello");  
String S2 = S1 + '!';  
S1 = S1 + S1;  
System.out.println(S1);
```

- A. hellohello
- B. hello!hello!
- C. hello!hello
- D. hellohello!
- E. !hello!hello

2. How many stars are printed by the following code fragment?

```
for (int count = 0; count < 3; count++) {  
    int c = count;  
    while ( c < 7 ) {  
        System.out.print("*");  
        c++;  
    }  
}
```

- A. 0
- B. 1
- C. 7
- D. 18
- E. 21

3. The int value of the character 'C' is 67. What is output when the following code executes?

```
String s = new String( "asdfgh" );  
s = "WES" + s + 67;  
System.out.println( s.toUpperCase() );
```

- A. WESASDFGH67
- B. WESasdfgh67
- C. asdfghWES67
- D. WESASDFGHC
- E. ASDFGHWES67

4. How many times is the condition “(count <= 6)” in the following code fragment evaluated?

```
int count = 3;  
do {  
    count++;  
} while ( count <= 6 );
```

- A. 3
- B. 4
- C. 5
- D. 9
- E. 18

5. The int value of the character 'C' is 67, and the int value of the character 'S' is 83. What does the following code print?

```
System.out.println("C" + 'S' + 3 + 0 + 2);
```

- A. CS
- B. CS5
- C. CS302
- D. C88
- E. 155

6. What is output when the following code executes?

```
int y = 2;
do {
    y += y;
} while( y <= 40 );
System.out.println( "y = " + y );
```

- A. y = 32
- B. y = 38
- C. y = 40
- D. y = 42
- E. y = 64

7. Suppose a method might cause an exception *BadValException* to be thrown. In which of the following cases will there *not* be a compile-time error?

- I. The method has “throws *BadValException*” in its header.
- II. The code that might cause the exception to be thrown is inside a *try* block with a *catch* clause: `catch (BadValException bve)`.
- III. The method has no *throws* clause, and the code that might cause the exception is not in a *try/catch* block, but the exception is an *unchecked* exception.

- A. I only
- B. II only
- C. III only
- D. I or II only
- E. I, II, or III

8. What is output when the following code executes?

```
int j = 0;
while (j < 3 ) {
    for (int k = 0; k <= j; k++) System.out.print("+");
    System.out.println(j);
    j++;
}
```

A.

```
+0
++1
+++2
```

B.

```
0
+1
++2
```

C.

```
+1
++2
+++3
```

D.

```
1
+2
++3
```

E.

```
+0
++1
+++2
++++3
```

Exercise 2: Iterators

Assume that you have an iterator of type *GroceryListIterator* called *itemIt*. The *GroceryListIterator* class has methods *hasNext()*, which returns true if there is another item (and false otherwise), and *getNext()*, which returns the next item (or throws *NoSuchElementException* if there are no more items).

The items returned by the iterator are *Food* objects. The *Food* class has an instance method *inCart()* that returns true if that item is in the cart and false if it still needs to be picked up. The food class also has an instance method called *printInfo()* that prints the name of the item and its location in the store.

Write code that uses the iterator to go through the list and prints out the name and location of each item that still needs to be picked up.

Exercise 3: Practice Short-Answer Questions

1. For each of the following code fragments, say which line (if any) will cause a compiler error and why.

Fragment 1

```
char ch = 'a' + 'b';
char ch = new char('a');
char ch = "a";
char ch = 'a' + 3;
```

Fragment 2

```
StringBuffer buf = new StringBuffer("WESCS");
StringBuffer buf = "WESCS";
String str = "WESCS";
```

Fragment 3

```
if(true && false) {
    methodA();
}
```

Fragment 4

```
int i = 54;
int j = i;
if(54 == j) {
    System.out.println("j is " + 54);
}
```

2. Assume that variable *sb* has been declared as follows

```
StringBuffer sb;
```

and has been initialized to store a string that is four characters long. How would you create a new *StringBuffer* named *buf* to store the first three characters of the string in *sb*? Does executing your code change the value of *sb*?

3. Assume that *Dog* is a class that stores only the weight, age, and name of a dog, and that the *Dog* constructor takes these three arguments, respectively. Also assume that the *Dog* class provides a *getAge()* method that returns the dog's age.

What are the values of *sameAge* and *sameDog* after the following code executes?

```
Dog dog1 = new Dog(25, 3, "Max");
Dog dog2 = new Dog(25, 3, "Max");

boolean sameAge = (dog1.getAge() == dog2.getAge());
boolean sameDog = (dog1 == dog2);
```

4. Which of the following are always executed in Java? (There may be more than one.)
- The default case of a switch statement (when the switch is executed)
 - The finally block of a try-catch (when the try-catch block is executed)
 - The else block of an if-else statement (when the if-else statement is executed)
 - A constructor of a class (when an instance of the class is created)
 - Every break in a switch statement (when the switch is executed)
5. Which of the following statements is/are true?
- (a) Constructors need at least one parameter.
 - (b) Constructors can't return anything.
 - (c) StringBuffer methods can be used on Strings and vice versa.

6. The following code contains two logical errors. Can you find and fix them?

```
class Student {
    private String name;
    private int id;

    public Student(String n) {
        String name = n;
    }

    public void setID(int i) {
        i = id;
    }

    public int getID() {
        return id;
    }
}
```

Using the (corrected) Student class definition, draw memory diagrams for the following code fragment:

```
Student s1 = new Student("Bob");
s1.setID(7111);

Student s2 = new Student("Sally");
s2.setID(5363);

Student s3 = s1;
s3.setID(s2.getID());
```

Assume that the above code fragment has executed. What would be the boolean values of the each of the following expressions?

```
s1 == s3
s2 == s3
s1.getID() == s2.getID()
```

7. What is the value of *str* after the following code is executed?

```
int k = 0;
String str = "";

do
{
    str += "to be";
    if(k%2==0) str += " or not ";
    k++;
} while(k<2);
```

8. Which of the following statements will print out a true sentence? (There may be more than one.)

```
System.out.println("There are " + 3 + 1 + " days in October.");
System.out.println("There are " + "3" + "1" + " days in October.");
System.out.println("There are " + 30 + 1 + " days in October.");
```

9. When using a try-catch block to handle exceptions, which of the following is better:
- (a) Handle the most specific exceptions in earlier “catch” blocks, then work your way down to general exceptions (e.g., you would catch *NullPointerException* before *Exceptions*)
 - (b) Start with general exceptions and work your way down to specific exceptions (e.g., you would catch *Exceptions* before *NullPointerException*).

Explain your choice.

Exercise 4: Practice with Exceptions

Divide into two teams to play a game like jeopardy involving questions about the code on the next page. For each question, the team that rings their bell first gets to try to answer the question. If the answer is right, the team gets points, and gets to choose the point value of the next question.

The questions and answers are on the following pages.

```

public class ExceptionExample {

    public static void main(String[] args) {
        foo();
        try {
            bar();
        } catch (IndexOutOfBoundsException iobe) {
            System.out.println("ERROR 1");
        } catch (ArithmeticException ae) {
            System.out.println("ERROR 2");
        } finally {
            System.out.println("DONE");
        }
    }

    public static void foo() {
        // PROGRAM LINE A

        try {
            // PROGRAM LINE B
        } catch (NullPointerException npe) {
            System.out.println(npe.getMessage());
            npe.printStackTrace();
        }
    }

    public static void bar() {
        // PROGRAM LINE C

        try {
            // PROGRAM LINE D
            methodX();
        } catch (NullPointerException npe) {
            System.out.println("ERROR 3");
        } catch (IndexOutOfBoundsException iobe) {
            System.out.println("ERROR 4");
        }

        System.out.println("DONE BAR");
    }

    public static void methodX() {
        // PROGRAM LINE E

        try {
            // PROGRAM LINE F

            } catch (IndexOutOfBoundsException iobe) {
                System.out.println(iobe.getMessage());
                iobe.printStackTrace();
            } catch (NumberFormatException nfe) {
                System.out.println("ERROR 5");
                return;
            } finally {
                System.out.println("DONE METHODX");
            }
        }
    }
}

```

100 point questions

Q: What is the output if `NumberFormatException` occurs at line A?

A: A stack trace would be printed, and the program would crash.

Q: What is the output if `NumberFormatException` occurs at line B?

A: A stack trace would be printed, and the program would crash.

Q: What is the output if `NumberFormatException` occurs at line C?

A: DONE is printed first, then a stack trace would be printed, and the program would crash.

Q: What is the output if `NumberFormatException` occurs at line D?

A: DONE is printed first, then a stack trace would be printed, and the program would crash.

Q: What is the output if `NullPointerException` occurs at line C?

A: DONE is printed first, then a stack trace would be printed, and the program would crash.

Q: What is the output if `NullPointerException` occurs at line D?

A: ERROR 3
DONE BAR
DONE

Q: What is the output if `IndexOutOfBoundsException` occurs at line A?

A: A stack trace would be printed, and the program would crash.

Q: What is the output if `IndexOutOfBoundsException` occurs at line B?

A: A stack trace would be printed, and the program would crash.

Q: What is the output if `ArithmeticException` occurs at line A?

A: A stack trace would be printed, and the program would crash.

Q: What is the output if `NullPointerException` occurs at line A?

A: A stack trace would be printed then the program would crash.

200 point questions

Q: What is the output if ArithmeticException occurs at line B?

A: A stack trace would be printed, and the program would crash.

Q: What is the output if ArithmeticException occurs at line C?

A: ERROR 2
DONE

Q: What is the output if ArithmeticException occurs at line D?

A: ERROR 2
DONE

Q: What is the output if IndexOutOfBoundsException occurs at line C?

A: ERROR 1
DONE

Q: What is the output if IndexOutOfBoundsException occurs at line D?

A: ERROR 4
DONE BAR
DONE

Q: What is the output if NumberFormatException occurs at line E?

A: DONE
then the NumberFormatException message would be printed and the program would crash

Q: What is the output if NullPointerException occurs at line B?

A: The NullPointerException message would be printed, then the following:
DONE METHODX
DONE BAR
DONE

Q: What is the output if NullPointerException occurs at line E?

A: ERROR 3
DONE BAR
DONE

Q: What is the output if NullPointerException occurs at line F?

A: DONE METHODX
ERROR 3
DONE BAR
DONE

300 point questions

Q: What is the output if IndexOutOfBoundsException occurs at line E?

A: ERROR 4
DONE BAR
DONE

Q: What is the output if IndexOutOfBoundsException occurs at line F?

A: The IndexOutOfBoundsException message would be printed, then the stack trace, then:
DONE METHODX
DONE BAR
DONE

Q: What is the output if ArithmeticException occurs at line E?

A: ERROR 2
DONE

Q: What is the output if ArithmeticException occurs at line F?

A: DONE METHODX
ERROR 2
DONE

Q: What is the output if NumberFormatException occurs at line F?

A: ERROR 5
DONE METHODX
DONE BAR
DONE

Q: What is the output if there are NO EXCEPTIONS?

A: DONE METHODX
DONE BAR
DONE

Q: At what lines would an IndexOutOfBoundsException cause the message "ERROR 1" to be printed (ignore other things that might be printed as well)?

A: Line C only