CS 1323-020: Introduction to Computer Programming
Exam 2
October 15, 2014

General instructions:

- Please wait to open this exam booklet until you are told to do so.
- This examination booklet has 12 pages. You also have been issued a bubble sheet.
- Write your name, university ID number and date, and sign your name below. Also, write your name and ID number on your bubble sheet, and fill in the bubbles for your ID.
- The exam is open book and open notes, but is closed electronic device. The only exception is that you may use an electronic device to display a PDF copy of the book (all communication must be turned off and no other applications may be used)c.
- The exam is worth a total of 100 points (and 10% of your final grade).
- You have 1.25 hours to complete the exam. Be a smart test taker: if you get stuck on one problem go on to the next.
- Use your bubble sheet to answer all multiple-choice questions. Make sure that the question number and the bubble row number match when you are answering each question. Use the provided space in this exam booklet to answer the coding questions.

On my honor, I affirm that I have neither given nor received inappropriate aid in the completion of this exam.

Signature: _____

Name: _____

ID Number: _____

Date: _____

Question	Points	Score
Methods	15	
Logic	21	
Objects	18	
Loops and Lists	18	
Coding	28	
Total:	100	

Part I. Methods

1. (3 points) Given the following block of code. Which line contains an error?

```
1   public static int twice(int x)
2   {
3     return(2 * z);
4   }
5
6   public static void main(String[] args)
7   {
8     int z = 4;
9     int y = twice(z);
10
11    System.out.println(y);
12  }
```

A. Line 1 **B. Line 3** C. Line 8 D. Line 9 E. There are no errors

2. (3 points) What is printed by the following program?

```
public static int computeValue(int a, int b)
{
  int c = a;
  a = b;
  b = c + a;
  return(b);
}

public static void main(String[] args)
{
  int a = 5;
  int b = 7;

  int c = computeValue(b, a) + b;

  System.out.println(a);
}
```

A. 5 B. 7 C. 14 D. 21 E. Answer not shown

3. (3 points) What is printed by the following program?

```
public static int computeValue(int a, int b)
{
  int c = a - b;
  b = c + 2;
  a = a - c;
  return(c);
}

public static void main(String[] args)
{
  int a = 4;
  int b = 9;

  int c = computeValue(b, a) + b;

  System.out.println(c);
}
```

A. 4 B. 9 **C. 14** D. 16 E. Answer not shown

4. (3 points) What is printed by the following program?

```
public static int transformValue(int x)
{
  return(2 * x - 3);
}

public static void main(String[] args)
{
  int z = 4;
  int y = transformValue(transformValue(z));

  System.out.println(y);
}
```

A. 4 B. 5 **C. 7** D. 13 E. Answer not shown

5. (3 points) Given the following block of code. Which line contains an error?

```
1  public static double invert(int x)
2  {
3    return(1.0 / x);
4  }
5
6  public static void main(String[] args)
7  {
8    int m = 13;
9    double n = invert(m);
10
11   System.out.println(n);
12 }
```

A. Line 1 B. Line 3 C. Line 8 D. Line 9 **E. There are no errors**

Part II. Logic

6. (3 points) What is printed by this block of code?

```
double p = 2.718;
double q = 45.27;
if(!(q < p) || p > 17.3)
   System.out.println(p);
else
   System.out.println(q - 4.1);
```

A. 2.718 B. 17.3 C. 41.17 D. 45.27 E. Answer not shown

7. (3 points) What is printed by this block of code?

```
int LUH = 3417;
int THX = 1138;

System.out.println(LUH > THX);
```

A. 3417 B. 3417 > 1138 **C. true** D. false E. Answer not shown

8. (3 points) What result is printed by this program?

```
public static boolean compare(int a, int b)

if(a > b) {
  return true;
}else{
  System.out.println(a);
  return false;
}

public static void main(String[] args)
{
  int c = 42;
  int d = 42;
  if(compare(c, d) || compare(d, c))
    System.out.println(c);
  else
    System.out.println(d + c);
}
```

A. 42 B. 84 C. 42 followed by 42 D. 42 followed by 84
E. Answer not shown

9. (3 points) What is printed by this block of code?

```
double a = 2.7;
int b = 6;
if(a > b)
   System.out.println(a);
else
   System.out.println(a + b);
```

A. 2.7 B. 6 C. 8 **D. 8.7** E. Answer not shown

10. (3 points) What result is printed by this program?

```
public static boolean compare(int a, int b)

if(a > b) {
  return true;
}else{
  System.out.println(a);
  return false;
}

public static void main(String[] args)
{
  int c = 7;
  int d = 11;
  if(compare(c, d) && compare(d, c))
    System.out.println(c);
  else
    System.out.println(d);
}
```

A. 7 B. 11 C. 7 followed by 7 **D. 7 followed by 11**
E. Answer not shown

11. (3 points) What is printed by this block of code?

```
double j = 1.618;
int k = 23;
if(j < 4.1 && !(k > 12))
   System.out.println(k);
else
   System.out.println((int) (k + j));
```

A. 1.618 B. 23 **C. 24** D. 24.618 E. Answer not shown

12. (3 points) What result is printed by this program?

```
public static boolean compare(int a, int b)

if(a > b) {
  return true;
}else{
  System.out.println(a);
  return false;
}

public static void main(String[] args)
{
  int c = 13;
  int d = 5;
  if(compare(c, d) || compare(d, c))
    System.out.println(c);
  else
    System.out.println(d);
}
```

A. 5 **B. 13** C. 5 followed by 13 D. 13 followed by 5
E. Answer not shown

Part III. Objects

13. (3 points) What result is printed by this block of code?

```
Integer x = 42;
String s1 = "The answer is ";
String s2 = S1 + x;
```

A. 42 B. The answer is C. The answer is 42 **D. There is an error**
E. Answer not shown

14. (3 points) True or False: for any given class, all object instances of that class use the same amount of memory.

A. True **B. False** C. There is an error

15. (3 points) What result is printed by this block of code?

```
String s1 = "foo";
String s2 = s1;

s2 += s1.toUpper();

System.out.println(s2);
```

A. foo B. foofoo C. FOOfoo **D. fooFOO** E. FOOFOO

16. (3 points) What result is printed by this program?

```
public static StringBuilder makeString(StringBuilder s)
{
  StringBuilder sNew = s;
  sNew.append("Zero");
  return(sNew);
}

public static void main(String[] args)
{
  StringBuilder s1 = new StringBuilder("Count");
  StringBuilder s2 = makeString(s1);
  s1.append("Interrupt");

  System.out.println(s1);
}
```

A. Count B. Zero C. CountZero D. CountInterrupt
E. Answer not shown

17. (3 points) What result is printed by this block of code?

```
String n0;
String n1 = new String("Bob");
String n2 = new String("Fred");
n0 = n1;
n1 = n2 + "dy";
System.out.println(n0);
```

A. Bob B. Fred C. Freddy D. There is an error E. Answer not shown

18. (3 points) What result is printed by this block of code?

```
StringBuilder b0;
StringBuilder b1 = new StringBuilder("Bob");
StringBuilder b2 = new StringBuilder("Fred");
b0 = b2;
b1 = b2;
b1.append("dy");
System.out.println(b0);
```

A. Bob B. Fred **C. Freddy** D. There is an error E. Answer not shown

Part IV. Loops and Lists

19. (3 points) What result is printed by this block of code?

```
String s1 = "able was I er";
String s2 = s1;

for(int i = s1.length()-2; i >= 0; i -= 1){
  s2 = s2 + s1.charAt(i);
}

System.out.println(s2);
```

A. able was I er B. re I saw elba C. able was I erre I saw elba
D. able was I ere I saw elba E. re I saw elbaable was I er

20. (3 points) What result is printed by this block of code?

```
ArrayList<Integer> ints = new ArrayList<Integer>();

for(int i = 0; i < 8; i += 3)
{
  ints.add(i * 2);
}

int k = 1;
int sum = 0;

for(Integer j: ints)
{
  sum = sum + j * k;
  k = -k;
}

System.out.println(sum);
```

A. -8 B. -6 **C. 6** D. 8 E. Answer not shown

21. (3 points) What is printed by this block of code?

```
ArrayList<String> list = new ArrayList<String>();
list.add("asherah");
list.add("Hiro");
list.add("uncle enzo");
list.add("Asherah");
list.add("hiro");
list.add("Uncle Enzo");

for(int i = 0; i < list.size(); ++i) {
  String s = list.get(i);
  if(s.equals("hiro")) {
    System.out.println(i);
    break;
  }
};
```

A. 1 B. 2 C. 3 **D. 4** E. Answer not shown

22. (3 points) What is printed by this block of code?

```
ArrayList<Integer> list = new ArrayList<Integer>();

list.add("Michelangelo");
list.add("Rafael");
list.add("Leonardo");
list.add("Donatello");

System.out.println(list.get(3));
```

A. Michelangelo B. Rafael C. Leonardo D. Donatello
E. There is an error

23. (3 points) What is printed by this block of code?

```
ArrayList<Double> doubles = new ArrayList<Double>();

doubles.add(0, 2.7);
doubles.add(0, 1.6);
doubles.add(1, 3.1);
doubles.add(2, 6.2);

System.out.println(doubles.get(3) + doubles.get(0));
```

A. 4.3 B. 5.9 C. 7.8 D. 8.9 E. Answer not shown

24. (3 points) What result is printed by this block of code?

```
ArrayList<Integer> integers = new ArrayList<Integer>();

integers.add(0, 2);
integers.add(0, 9);
integers.add(1, 3);
integers.add(0, 42);
integers.remove(1);

System.out.println(integers.get(1) + integers.get(0));
```

A. 2 B. 5 C. 11 **D. 45** E. Answer not shown

Part V. Coding

25. (14 points) Write a **method** in the space below that takes as input an ArrayList of Strings and returns the number of strings in the list that begin with an upper case letter.

Solution:

```
public static int countUpper(ArrayList<String> list)
{
  int count = 0;

  for(String s: list) {
    char c = s.charAt(0);
    if(c >= 'A' && c <= 'Z')
       ++count;
  }
  return count;
}
```

26. (14 points) Write a **method** that takes as input a String and returns the number of times that a letter in the string is followed immediately by the next letter in the alphabet. You may assume that the string contains only letters and you may consider upper and lower case letters as distinct.

Examples:

- "aa": 0
- "ab": 1
- "ac": 0
- "abc": 2
- "aB": 0
- "abcghi": 4

Solution:

```
public static int findConsecutive(String s)
{
  int count = 0;

  for(int i = 0; i < strg.length() - 1; ++i){
    if(strg.charAt(i) == strg.charAt(i+1) - 1){
      ++count;
    }
  }
  return count;
}
```