Computer Programming and Game Design Semester 1 Review #1 Answers
For all problems, if there are no directions, state what is printed.

1. What are the 4 primitive data types of variables used in Java that we have studied and what are they used to store? What is the class we have studied that behaves like a primitive and what is it used to store?

   **Primitives:** int, double, char, boolean  
   **Class:** String

2. What type of variable would you use to store your name?

   String

3. What type of variable would you use to store the square root of 2?

   double

4. What type of variable would you use to store your age?

   int

5. Write a single line of code that will create a double precision variable called \( p \) and store 1.921 in it.

   ```java
double p = 1.921;
```

6. Write a single line of code that will create an integer variable called \( i \) and store 407 in it.

   ```java
   int i = 407;
   ```

7. Write a single line of code that will create a String variable called \( \text{my\_name} \) and store your name in it.

   ```java
   String my_name = "Ms. B";
   ```

8. Which of the following are legal variable names? Circle them.

   scooter13  139_scooter  homer-5  ;mary  public  doubled  double ab-c

9. All of the following are legal variable names, but some are not acceptable. Circle the most acceptable ways to create a variable name. Multiple answers are possible.
   a. GroovyDude
   b. GROOVYDUDE
   c. groovyDude
   d. Groovydude
   e. groovy_dude
   f. groovydude

10. The following line of code is illegal. There are 2 ways to fix it. What are they?

    ```java
double x = 3.589;
int x = 3.589;
int x = (int) 3.589;
int x = 3;
```

11. Write code in which a String variable \( s \) contains The number of rabbits is and an integer variable argh has a value of 129. Concatenate these variables into a String called report. Then print report. The printout should yield:

    The number of rabbits is 129.

    Note that we want a period to print at the end of the sentence.

    ```java
    String report = s + " " + argh + ".";
    System.out.println(report);
    ```
12. What is the output of `System.out.println( p.toUpperCase( ) );` if `p = “Java is fun!”`?

```
JAVA IS FUN!
```

13. Write code that will assign the value of `Computer Science is for nerds` to the `String` variable `g`. Then have it print this `String` with nothing but “small” letters.

```
String g = "Computer Science is for nerds";
System.out.println(g.toLowerCase());
```

14. What will be the value of `c`?

```
String c;
String m = “The Gettysburg Address”;
c = m.substring(4);
```

```
ettysburg Address
```

15. What will be the value of `c`?

```
String b = “Four score and seven years ago,”;
String c = b.substring(7, 12);
```

```
ore a
```

16. What is the value of `count`?

```
int count;
String s = “Surface tension”;
count = s.length( );
```

```
15
```

17. Write code that will look at the number of characters in `String m = “Look here!”`; and then print “Look here!” has 10 characters.

```
Use the `length( )` method to print the 10 ….you must also force the two quotes to print.
System.out.println("" + m + " has " + m.length() + " characters.");
```

18. How would you print the following?

```
All “good” men should come to the aid of their country.
System.out.println("All \"good\" men should come to the aid of their country.");
```

19. What is output by the following?

```
String pq = “Eddie Haskel l”;
int hm = pq.length( );
String ed = pq.substring(hm - 4);
System.out.println(ed);
```

```
kell
```

20. Which character is at the 5\(^{th}\) index in the String “Herman Munster”? 

```
n
```

21. `int h = 103;` 
```
int p =5;
System.out.println(++h + p);
System.out.println(h);
```

```
109
104
```
22. Give three code examples of how to increment the integer \( j \) by 1.

\[
j = j + 1; \quad j += 1; \quad j++; \text{ or } ++j;
\]

23. double def;
    double f = 1992.37;
    def = f;
    System.out.println(def);
    1992.37

24. Write a single line of code that will print the integer variable \( zulu \) and then decrement its value by 1.
    System.out.println(zulu--);

25. int a = 100;
    int b = 200;
    b/=a;
    System.out.println(b + 1);
    3

26. Write a single line of code to subtract \( p-30 \) from the integer value \( v \) and store the result back in \( v \).
    \( v -= p-30; \)

27. Do number 26 using a different method.
    \( v = v - (p - 30); \)

28. int p = 40;
    int q = 4;
    System.out.println(2 + 8 * q / 2 - p);
    -22

29. int sd = 12;
    int x = 4;
    System.out.println( sd%(++x) );
    System.out.println(x);
    2
    5

30. On a single line of code declare \( m, b, \) and \( f \) to be double and on that same line initialize them all to be 3.14.
    \( \text{double } m = 3.14, b = 3.14, f = 3.14 \)

31. int m = 36;
    int j = 5;
    m = m / j;
    System.out.println(m);
    7

32. System.out.println(3/4 + 5*2/33 –3 +8*3);
    21

33. Write a statement that stores the remainder of dividing the variable \( i \) by \( j \) in a variable named \( k \).
    \( k = i \% j; \)

34. int j = 2;
    System.out.println(7%3 + j++ + (j – 2 ));
    4
35. Show three different ways to decrement the variable \( m \).
   \[
   m = m - 1; \quad m -= 1; \quad m--; \text{ or } --m;
   \]

36. Write code that will take the square root of \( x \) and store the result in \( y \).
   \[
   y = \text{Math.sqrt}(x);
   \]

37. Write code that will multiply the value of the integer \( j \) times the absolute value of the integer \( m \) and then store the result in the integer \( k \).
   \[
   k = j * \text{Math.abs}(m);
   \]

38. Write a statement that will print the result of \( 2^{1.5} \).
   \[
   \text{System.out.println(Math.pow}(2, 1.5));
   \]

39. Write a line of code that multiplies \( p \) times \( \pi \) and stores the result in \( b \).
   \[
   b = p * \text{Math.PI};
   \]

40. String \( s1 = \text{“school BUS”;} \)
   
   if ( \( s1.equals(\text{“school bus”}); \) )
   
   System.out.println(“Equal”);
   
   else
   
   System.out.println(“Not equal”);
   
   **Not equal**

41. String \( s1 = \text{“school BUS”;} \)
   
   if ( \( s1.equalsIgnoreCase(\text{“school bus”}); \) )
   
   System.out.println(“Equal”);
   
   else
   
   System.out.println(“Not equal”);
   
   **Equal**

42. int \( j = 19, m = 200; \)
   
   if ( \( j = = 18 \) )
   
   m++; j++;
   
   System.out.println(m);
   
   System.out.println(j);
   
   200
   
   20

43. Write a statement that will store false in boolean \( b \) if the value in \( g \) is not equal to 34.
   \[
   \text{if (} g != 34 \text{)}
   \]
   
   \[
   b = \text{false}
   \]

44. Write a statement that will store a true in boolean \( b \) if integer \( k \) is even, false if it is odd.
   \[
   \text{if (} k \% 2 == 0 \text{)}
   \]
   
   \[
   b = \text{true};
   \]
   
   else
   
   \[
   b = \text{false};
   \]
String s = “Lucky hockey puck”;
String m = “uck”;
int j = 6, z = 99;

45.int k = s.indexOf(m);
    System.out.println(k);
    1
46.int k = s.indexOf(“uck”, j);
    System.out.println(k);
    14
47.int k = s.indexOf(‘c’);
    System.out.println(k);
    2
48.String str = s.replace(‘o’, ‘p’);
    System.out.println(str);
    Lucky hpckey puck
49.int k = s.lastIndexOf(m, j + 3);
    System.out.println(k);
    1
50.char p = s.charAt(7);
    System.out.println(p);
    o
51.int k = s.indexOf(z);
    System.out.println(k);
    2
52.int k = s.lastIndexOf(m);
    System.out.println(k);
    14
53.int k = s.indexOf(‘y’, j);
    System.out.println(k);
    11
54.char p = s.charAt(z - 90);
    System.out.println(p);
    k
55.int k = s.indexOf(m, 15);
    System.out.println(k);
    -1
56.int k = s.indexOf(z + 2, 4);
    System.out.println(k);
    10
57.int k = s.lastIndexOf(‘h’);
    System.out.println(k);
    6
58.int k = s.lastIndexOf(121);
    System.out.println(k);
    11
59.String str = s.replace(‘y’, ‘A’);
    System.out.println(str);
    LuckA hockeA puck
The following code applies to problems 60-65. In each problem, state what’s printed.

```java
String xyz = “bathtub”;
String ddd = “BathTUB”;
String ccc = xyz;
String wc = “Whooping crane”;
String s = “\t\tGu daay, mates \n”;

60. int j = xyz.compareTo(wc);
    boolean bb;
    if (j > 0)
        bb = true;
    else
        bb = false;
    System.out.println(bb);
true
61. String v = ddd.toLowerCase( )
    int fg = ccc.compareTo(v);
    System.out.println(fg + 1);
1
62. System.out.println(ddd.compareTo(ccc));
   a negative number
63. System.out.println(xyz.compareTo(ccc));
   0
64. System.out.println(“Stupid”.compareTo(ddd));
   a positive number
65. System.out.println(“>>>” + s.trim( ) + “<<<”);
   >>>Gu daay, mates<<<
```
Computer Programming and Game Design Semester 1 Review #2 Answers

1. Examine the following code:
   ```java
   double length = 44.0;
   int width = 13;
   Rectangle myRect = new Rectangle(length, width);
   ```
   a) Name the class **Rectangle**
   b) Name the object **myRect**
   c) What are the data types passed to the constructor? double, int

2. Write out the signature for the constructor of the Rectangle class from #1 above.
   ```java
   Rectangle(double, int)
   ```

3. Suppose a constructor for the Lunch class is as follows:
   ```java
   public Lunch(boolean diet, int cal) {
       diet_yes_no = diet;
       calories = cal;
   }
   ```
   Write appropriate code that will create a Lunch object called yummy5. Tell the constructor that, yes, you are on a diet, and the number of calories should be 900.
   ```java
   Lunch yummy5 = new Lunch(true, 900);
   ```

4. Examine the following code:
   ```java
   SaturdayDetention sa = new SaturdayDetention("B20", true);
   ```
   a) Name the class **SaturdayDetention**
   b) Name the object **sa**
   c) What are the data types passed to the constructor? String, boolean

5. One class can be used to create many objects. Fill in the blanks with the correct use of object and class.

6. Fix the following constructor for the School class.
   ```java
   public void School(int d, String m) {
       … some code …
   }
   ```
   ```java
   public School(int d, String m)
   ```

7. Which must exist first?
   a) The class
   b) The object
8. Is the following legal? If not, why?

//Constructor in the House class
public House(int j, boolean k)
{   …some code…   }

//This code is in main of the HouseTester class
int p = 3, q = 9;
House myHouse = new House(p, q);
No, q is an int and the House constructor needs the 2nd parameter to be boolean.

9. //Constructor
public Band(int numMembers, int numInstruments, String director, double amount)
{   …code…   }

Band ourBnd = new Band(mem, instrmnts, “Mr. Perkins”, budget);

What should be the data types of:
a) mem int
b) instrmnts int
c) budget double

The following code is used for question 10 – 14:

public class DumbStory
{
    private int var1;
    private double var2;
    private String sss;

    public DumbStory(String x, int y, double z)  {   …some code…   }

    public void addParagraph(String p) {   …some code…   }
    public String getPlotSummary( ) {   …some code…   }
    public String getSSS() { return sss;   }
}

10. From the DumbStory class above, write the signature of the constructor.
    DumbStory(String, int, double)

11. From the DumbStory class above, what is/are the instance field(s).
    var1, var2, sss

12. From the DumbStory class above, write the signature(s) of the all the method(s).
    void addParagraph(String)
    String getPlotSummary()
    String getSSS()

13. Write code that instantiates an object called joker from the DumbStory class. Pass the following
    parameters to the constructor: The integer should be 19, the String “Ralph”, and the double 24.18.
    DumbStory joker = new DumbStory(“Ralph”, 19, 24.18);

14. Write code that will print the value of the DumbStory data member, sss. Assume you have already
    created a DumbStory object called bart.
    System.out.println(bart.getSSS());
15. Create a class called Trail. It should have instance fields x and y that are integers. Instance field s should be a String. The constructor should receive a String which is used to initialize s. The constructor should automatically set x and y both equal to 10. There should be a method called met that returns a String that is the equivalent of x*y. This method receives no parameters.

```java
public class Trail {
    private int x;
    private int y;
    private String s;

    public Trail(String initialS) {
        s = initialS;
        x = 10;
        y = 10;
    }

    public String met() {
        int d = x * y;
        return "" + d;
    }
}
```

16. Consider a method whose signature is: public double peachyDandy(int z)

Write code that would call this for an object named zippo.

```java
double x = zippo.peachyDandy(12); // 12 can be any number
```

17. Refer to the information in 17 above. What’s wrong with trying to call this method in the following fashion?

```java
double hamburger = zippo.peachyDandy(127.31);
```

The peachyDandy method receives an int and in this case a double (127.31) is passed.
18. Create a class called Student.
   a) This class has 5 private instance variables: first name, last name, current grade in school, expected year of graduation, current grade point average.
   b) There is one constructor. It accepts data to populate the first name, last name, the current grade in school and expected year of graduation. The grade point average is set to 0.
   c) There are getters for each of the 5 instance variables.
   d) There is a method to set the grade point average.

```java
public class Student {

    private String firstName;
    private String lastName;
    private int currentGrade;
    private int graduationYear;
    private double gpa;

    public class Student (String fn, String ln, int grade, int year) {
        firstName = fn;
        lastName = ln;
        currentGrade = grade;
        graduationYear = year;
        gpa = 0.0;
    }

    public String getFirstName() {
        return firstName;
    }

    public String getLastName() {
        return lastName;
    }

    public int getCurrentGrade() {
        return currentGrade;
    }

    public int getGraduationYear() {
        return graduationYear;
    }

    public double getGpa() {
        return gpa;
    }

    public void setGpa(double newGpa) {
        gpa = newGpa;
    }

}
```
19. Add code to the following main method. Create an object from the Student class for a student with the following information: Demonia Jones is currently in 11th grade and is expected to graduate in 2017. Then set the gpa to 3.62.

```java
public void main(String args[]) {
    Student dj = new Student("Demonia", "Jones", 11, 2017);
    dj.setGpa(3.62);
}
```