CSCI 1320 Java Commands

Hello, World!

```java
// imports go here
public class Hello {

    public static void main(String [] args) {
        System.out.println("Hello, World!"); // yay!
    }

    /*
    additional methods go here
    ... after main() but inside the class
    ... but not inside a comment!
    */
}
```
Link to Code

Expected output (on screen):

```
Hello, World!
```

Declaring Variables

```java
float x;
double y,z;
int ans;
char let;
String name;
boolean isFun;
```

x	?	ans	?
y	?	let	?
z	?	name	?
isFun	?		

Initializing Variables

```java
y= 0.1;
z= 7.5 + y;
name= "Fred"; // String use double quotes
let= 'R';      // chars use single quotes
a= (int) x;
a= a + 1;
isFun= true;
```

y	0.1	name	"Fred"
z	7.6	isFun	true
a	8		

Displaying Values

```java
System.out.println("Hello");
System.out.print("Answer is: ");
System.out.println(a);
System.out.println("Name is: "+name);
```

Output of statements assuming variables have values from previous examples:

```
Hello
Answer is: 8
Name is: Fred
```

Getting Input

```
1   import java.util.Scanner; // at top of file
2   . . .
3   Scanner kb;
4   kb= new Scanner(System.in);
5   int a;
6   double x;
7   String str1,str2;
8
9   System.out.print("Enter age: ");
10  a= kb.nextInt();
11  kb.nextLine(); // toss out extra newline
12
13  System.out.print("Enter num: ");
14  x= kb.nextDouble();
15  kb.nextLine(); // toss out extra newline
16
17  System.out.print("Enter word: ");
18  str1= kb.next();
19  kb.nextLine(); // toss out extra newline
20
21  System.out.print("Enter sentence: ");
22  str2= kb.nextLine();
23  // .nextLine() tosses out extra newline
```

a	?
x	?
str1	?
str2	?

```
Enter age: 7
Enter num: 2.5
Enter word: hi
Enter sentence: How are you?
```

a	7
x	2.5
str1	"hi"
str2	"How are you?"

Integer Arithmetic

```
1   int a,b,c,d,e;
2   a= 7;
3   b= -1;
4   c= a + b * 3; // 4
5   d= b - a / 3; // -3
6   e= a % 3;     // 1
```

a	7
b	-1
c	4
d	-3
e	1

Floating Point Arithmetic

```
1   double a,b,c,d;
2   a= 4.0;
3   b= -2.2;
4   c= a + b * 3;        // -2.6
5   d= Math.sqrt(a) + b; // -0.2
```

a	4.0
b	-2.2
c	-2.6
d	-0.2

Strings

```
1  int num1,num2;
2  String one, two, three;
3  one= "Amy";
4  two= "Hi, there!";
5  if (one == "Amy") { // nope!
6     System.out.println("Greetings!");
7  }
8  if (one.equals("Amy")) { // yep!
9     System.out.println("Hi, Amy!");
10 }
11 num1= one.length();
12 System.out.println(one.charAt(2));
13 num2= one.indexOf("the");
14 System.out.println(one.toUpperCase());
15 three= two.substring(4,7)+"n";
```

num1	3
num2	4
one	"Amy"
two	"Hi, there!"
three	"then"

Expected output:

```
Hi, Amy!
y
FRED
```

If Statements

```
1  if (a < 0) {
2     // do this if true
3  }
4  else {
5     // do this if false
6  }
```

Boolean Expressions

```
1  int a,b;
2  boolean c,d,e,f,g;
3  a= 7;
4  b= -1;
5  c= true;
6  d= a<b;
7  e= a<b || a>0;
8  f= a<=b && a!=0;
9  g= !isCool && a==7;
```

a	7
b	-1
c	true
d	false
e	true
f	false
g	true

While Loops

```
1  while (a < 0) {
2     // loop body
3  }
4
5  do {
6     // loop body
7  } while (a < 0);
```

For Loops

```
1  int i;
2  for (i=0; i<5; i=i+1) {
3     System.out.print(""+i+",");
4  }
```
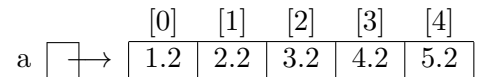
Expected output:

```
0,1,2,3,4,
```

Arrays

```
1  int i;
2  double [] a;       // declare array name
3  a= new double[5]; // reserve 10 doubles
4  a[0]= 1.2;
5  for (i=1; i<5; i++) {
6     a[i]= a[0]+i;
7  }
```

	[0]	[1]	[2]	[3]	[4]
a $\longrightarrow$	1.2	2.2	3.2	4.2	5.2

Methods

```
1  public static void showSum(double a, double b) {
2     double c;
3     c= a + b;
4     System.out.println("Sum is: "+c);
5  }
6
7  public static double calcSum(double a, double b) {
8     double c;
9     c= a + b;
10    return c;
11 }
12
13 // To call these methods:
14 double x= 7.5;
15 showSum(x,1.0);
16 showSum(x*2.0,x-2.0);
17 x= calcSum(1.0,2.2); // x= 3.2
18 System.out.println(x);
```

Expected output:

```
Sum is: 8.5
Sum is: 20.5
3.2
```

Formatted Output

```
1  double x= 7.5;
2  String str= "Fred";
3  int a= 2;
4
5  System.out.printf("%s is %d\n",str,a);
6  System.out.printf("A%5d %4.2fB\n",a,x);
7  System.out.printf("A%-5d %4.2fB\n",a,x);
```

Expected output:

```
Fred is 2
A    2 7.50B
A2    7.50B
```

Reading Text Files: Scanner

```
1    // requires some imports:
2  import java.util.Scanner;
3  import java.io.FileNotFoundException;
4  import java.io.FileInputStream;
5
6  public static double sumFile(String filename) throws
        FileNotFoundException {
7    Scanner numFile;
8    double num,total=0.0;
9
10   numFile= new Scanner(new FileInputStream(filename));
11   while (numFile.hasNextLine()) {
12     num= numFile.nextDouble();
13     total= total + num;
14     numFile.nextLine(); // toss out \n
15   }
16   numFile.close();
17   return total;
18 }
```

Suppose datafile looks like this:

```
1.5
10.2
2.3
5.2
```

Expected return value: 19.2

Reading Text Files: BufferedReader

```
1    // requires some imports:
2  import java.io.BufferedReader;
3  import java.io.FileReader;
4  import java.io.IOException;
5
6  public static double sumFile(String filename) throws
        IOException {
7    BufferedReader numFile;
8    double total=0.0;
9    String str;
10
11   numFile= new BufferedReader(new FileReader(filename));
12   while ((str= numFile.readLine())!=null) {
13     total= total + Double.parseDouble(str);
14   }
15   numFile.close();
16   return total;
17 }
```

Suppose datafile looks like this:

```
1.5
10.2
2.3
5.2
```

Expected return value: 19.2

Saving Text Files

```
1    // requires some imports:
2  import java.io.FileNotFoundException;
3  import java.io.PrintStream;
4
5  public static void saveData(String filename) throws
       FileNotFoundException
6  {
7     PrintStream f= new PrintStream(filename);
8     double y= 3.8234;
9
10    f.print("This is so fun!");
11    f.print("How are you?\n");
12    f.println("What do we do now?");
13    f.printf("I am am %8.1f feet tall\n",y);
14    f.close();
15 }
```

Expected output (in junk.txt):

```
This is so fun!How are you?
What do we do now?
I am    3.8 feet tall
```

Try-Catch

```
1
2  int num;
3  Scanner kb= new Scanner(System.in);
4
5  try {
6     System.out.print("Enter number: ");
7     num= kb.nextInt();
8     System.out.println("You entered: "+num);
9  }
10 catch (InputMismatchException e) {
11    System.out.println("Must enter an integer");
12    System.out.println(e);
13 }
```

Expected output if user enters 7.

```
Enter number: 7
You entered: 7
```

Expected output if user enters "frog".

```
Enter number: frog
Must be an integer
java.util.InputMismatchException
```