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	?
y	?
z	?
isFun	?

ans	?
let	?
name	?

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
z	7.6
a	8

name	"Fred"
isFun	true

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

```java
import java.util.Scanner; // at top of file
. . .
Scanner kb;
kb= new Scanner(System.in);
int a;
double x;
String str1,str2;

System.out.print("Enter age: ");
a= kb.nextInt();
kb.nextLine(); // toss out extra newline

System.out.print("Enter num: ");
x= kb.nextDouble();
kb.nextLine(); // toss out extra newline

System.out.print("Enter word: ");
str1= kb.next();
kb.nextLine(); // toss out extra newline

System.out.print("Enter sentence: ");
str2= kb.nextLine();
// .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

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

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

Floating Point Arithmetic

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

a	4.0
b	-2.2
c	-2.6
d	-0.2

Strings

```java
int num1,num2;
String one, two, three;
one= "Amy";
two= "Hi, there!";
if (one == "Amy") { // nope!
   System.out.println("Greetings!");
}
if (one.equals("Amy")) { // yep!
   System.out.println("Hi, Amy!");
}
num1= one.length();
System.out.println(one.charAt(2));
num2= one.indexOf("the");
System.out.println(one.toUpperCase());
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

```java
if (a < 0) {
   // do this if true
}
else {
   // do this if false
}
```

Boolean Expressions

```java
int a,b;
boolean c,d,e,f,g;
a= 7;
b= -1;
c= true;
d= a<b;
e= a<b || a>0;
f= a<=b && a!=0;
g= !isCool && a==7;
```

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

While Loops

```java
while (a < 0) {
   // loop body
}

do {
   // loop body
} while (a < 0);
```

For Loops

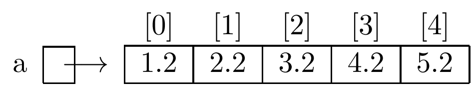
```java
int i;
for (i=0; i<5; i=i+1) {
   System.out.print(""+i+",");
}
```

Expected output:

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

Arrays

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



Methods

```java
public static void showSum(double a, double b) {
   double c;
   c= a + b;
   System.out.println("Sum is: "+c);
}

public static double calcSum(double a, double b) {
   double c;
   c= a + b;
   return c;
}

// To call these methods:
double x= 7.5;
showSum(x,1.0);
showSum(x*2.0,x-2.0);
x= calcSum(1.0,2.2); // x= 3.2
System.out.println(x);
```

Expected output:

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

Formatted Output

```java
double x= 7.5;
String str= "Fred";
int a= 2;

System.out.printf("%s is %d\n",str,a);
System.out.printf("A%5d %4.2fB\n",a,x);
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

```java
   // requires some imports:
import java.util.Scanner;
import java.io.FileNotFoundException;
import java.io.FileInputStream;

public static double sumFile(String filename) throws FileNotFoundException {
   Scanner numFile;
   double num,total=0.0;

   numFile= new Scanner(new FileInputStream(filename));
   while (numFile.hasNextLine()) {
      num= numFile.nextDouble();
      total= total + num;
      numFile.nextLine(); // toss out \n
   }
   numFile.close();
   return total;
}
```

Suppose datafile looks like this:

```
1.5
10.2
2.3
5.2
```

Expected return value: 19.2

Reading Text Files: BufferedReader

```java
   // requires some imports:
import java.io.BufferedReader;
import java.io.FileReader;
import java.io.IOException;

public static double sumFile(String filename) throws IOException {
   BufferedReader numFile;
   double total=0.0;
   String str;

   numFile= new BufferedReader(new FileReader(filename));
   while ((str= numFile.readLine())!=null) {
      total= total + Double.parseDouble(str);
   }
   numFile.close();
   return total;
}
```

Suppose datafile looks like this:

```
1.5
10.2
2.3
5.2
```

Expected return value: 19.2

Saving Text Files

```java
   // requires some imports:
import java.io.FileNotFoundException;
import java.io.PrintStream;

public static void saveData(String filename) throws
    FileNotFoundException
{
   PrintStream f= new PrintStream(filename);
   double y= 3.8234;

   f.print("This is so fun!");
   f.print("How are you?\n");
   f.println("What do we do now?");
   f.printf("I am am %8.1f feet tall\n",y);
   f.close();
}
```

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

```java

int num;
Scanner kb= new Scanner(System.in);

try {
   System.out.print("Enter number: ");
   num= kb.nextInt();
   System.out.println("You entered: "+num);
}
catch (InputMismatchException e) {
   System.out.println("Must enter an integer");
   System.out.println(e);
}
```

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
```