Java...

Please, what does \{arg1, arg2\} mean...

CS 160 Final Review
Name the 8 primitive type variables?

int, double, float, long, char, boolean, byte, short
Write the correct contrapositive of the hypothesis $O(x) \land E(y) \rightarrow E(7xy)$?

$O(7xy) \rightarrow E(x) \lor O(y)$
Write the correct contradiction of the hypothesis $O(x) \land O(y) \Rightarrow O(7xy)$?

$O(x) \land O(y) \land E(7xy)$
// Write the correct post-condition
public static int foo (int x) {
    // pre-condition: -3 < x <= 4
    return (x * x - 3 * x + 4);
}

2 <= return value <= 14
// Write the correct pre-condition
public static int foo (int x) {
    return (x * x - 3 * x - 8);
    // post-condition: -10 <= return <= 2
}

-2 <= x <= 5
What is the loop invariant?

```java
int x = 2, y = 3, z = v1;
while (x <= 4){
    z += y;
    x++;
}
```

Since z starts at v1 and 3 gets added 3 times

- $2 \leq x \leq 5$
- $y = 3$
- $v1 \leq z \leq v1 + 9$
When $x = 3$, $y = 4$, what is the result?

$x/y + 10$
When $x = 3$, $y = 4$, what is the result?

$20\%x + y*3$
public static char Foo (String s) {
    return s.charAt(s.length()-1);
}

1. What is the return value of this method?
2. What does this method do?
3. How would I call this method in the main?

1. char
2. returns the last character of s
3. Foo("someString"); or Foo(someStringVariable);
Scanner s = new Scanner (System.in);
String wordBro = s.next();

Create a Scanner that reads in a word from the keyboard. Store the word in a String variable called wordBro.
Create a public static method called `caster`, that returns an int, it takes an double as a parameter. Return the int, caused from typecasting the parameter.

```java
public static int caster(double d) {
    return (int) d;
}
```
Create a Scanner that reads in an integer, double and then a full line from a file called *filename*. Store into my PRE-DEFINED variables: *myInt*, *myDouble*, *myLine*.

```java
try{
    Scanner s = new Scanner(new File("filename"));
    myInt = s.nextInt();
    myDouble = s.nextDouble();
    s.nextLine();
    myLine = s.nextLine();
    s.close();
} catch (IOException e) {
    System.out.println("Error: could not open file: " + filename);
}

OR
Scanner s = null;
try{
    s = new Scanner(new File("filename"));
} catch (IOException e) {
    System.out.println("Error: could not open file: " + filename);
}
myInt = s.nextInt();
```
myDouble = s.nextDouble();
s.nextLine();
myLine = s.nextLine();
s.close();
Declare and assign a 3x3 2D double array, called `doubleTable`, with all of the values assigned to 2.0.

double [][] doubleTable = new double [3][3];
for (int i = 0; i < doubleTable.length; i++)
  for (int j = 0; j < doubleTable[i].length; j++)
    doubleTable[i][j] = 2.0;
OR
double [][] doubleTable = {{2.0, 2.0, 2.0},{2.0, 2.0,2.0},{2.0,2.0,2.0}};
public class StudentData {
    int id;
    String firstName, lastName;
    public StudentData ( int id, String _firstName, String _lastName )
    {
        this.id = id;
        firstName = _firstName;
        lastName = _lastName;
    }
}

Initialize an array of StudentData objects called “CS160”. The array is of size 3.

StudentData [] CS160 = new StudentData [3];
public class StudentData {
    int id;
    String firstName, lastName;
    public StudentData (int _id,
                        String _firstName,
                        String _lastName)
    {
        id = _id;
        firstName = _firstName;
        lastName = _lastName;
    }
}

Use the following information to create three StudentData objects and store into the CS160 array from Part A.
- 1 Rob Drobs
- 2 Bob Crobs
- 3 Steve Jobs

CS160[0] = new StudentData (1, “Rob”, “Drobs”);
What does the following code do/What is array_name assigned to after this code is done?

```java
int [][] array_name = new int [4][7];
int i = 1;
for (int row = 0; row < array_name.length; row++)
    for (int col = 0; col < array_name[row].length; col++){
        array_name[row][col] = i;
        i++;
    }
```

prints the February calendar
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
Make a Scanner called **reader**, that reads a file called “names.txt”.

```java
try{
    Scanner reader = new Scanner(new File("names.txt"));
} catch (IOException e) {
    System.out.println("Error: could not open file: names.txt");
}
```
public Power (int n, int e) {
    number = n;
    exponent = e;
    result = Math.pow (n, e);
}
CoolName c = new CoolName();
c.multiplier (3);

[3, 6, 9, 12, 15]
No, you need to instead do `pw.println("I printed!!")`; to print to the file, currently this prints to the console.
No, the PrintWriter never got closed so it never got printed to the file.
What does this print?

String s = “marco polo”;
System.out.println(s.substring(0,3));
No, I didn’t add "new File" before my input.txt. It should be `Scanner read = new Scanner ("input.txt");` How the code is written the Scanner will parse the String “input.txt”
What is the loop invariant?

```java
int x = 1, y = 2, z = -5;
while (x <= 5){
    z += y;
    x++;
}
```

\[ y = 2, 1 \leq x \leq 6, -5 \leq z \leq 5 \]
\[ y = 2, 1 \leq x \leq 6, z = -5 + 5y \text{ (better solution)} \]
Write a for loop that prints the reverse of the String variable s.

```java
for (int i = s.length() - 1; i >= 0; i--)
    System.out.print(s.charAt(i));
```
public class Dog {
    private String name, breed;
    // constructor goes here
}

public Dog (String n, String b) {
    name = n;
    breed = b;
}
Declare a Scanner that reads from the keyboard. Write a do-while loop that asks the user “Are we there yet?”, give the user instructions (for example “yes will stop this loop”), store their response into a String variable, and stop the loop when the word is “yes”. NOTE: you can assume that the user will only enter a one word response.

Scanner keys = new Scanner (System.in);
String word = "";
do {
    System.out.println("Are we there yet?");
    System.out.println("Enter yes to stop");
    word = keys.next();
} while (!word.equalsIgnoreCase("yes"));
What are the following errors (there are 2)?

```java
public void writefile(String filename) {
    try {
        PrintWriter pw = new PrintWriter(new File(filename));
        for (int i = 0; i < 100; i++)
            pw.printf("%d", i);
    } catch (Exception e) {
        System.out.println("Can’t write to “ + filename);
    }
}
```

didn’t close pw
needs to be (no new PrintWriter): PrintWriter pw = new PrintWriter(new File (filename)); or PrintWriter pw = new PrintWriter (filename);
public void Foo (int [] array, char a, char b){
    for (int i = 0; i < array.length/2; i++)
        array[i] = a;
    for (int i = array.length/2; i < array.length; i++)
        array[i] = b;
}

What does this code do?

makes the first half of array to be the ascii value of the a variable and the second half of the array to be the ascii value from the b variable.
Let’s talk...
How do you compare objects and Strings?

.equals, NOT ==
What is the difference between Pass-by-Value and Pass-by-Reference?
What are some examples of each?

Pass-by-value: primitive types (int, double, char, etc). Must reassign to change a pass-by-value variable.

Pass-by-reference: objects (ie Arrays or objects that you create (ie CS160 object Array, as well as all of the objects inside of the CS160 object Array))
Why do you need to put a .nextLine() after you use .next(), .nextInt(), .nextDouble();?

token processing to line processing.

.nextLine looks for a new line character (\n’) in a line, so after reading a word, int, double, etc there is still a \n’ character to read, so you must “eat” the rest of the line to read the next line.
Why do we need `toString` methods? What do `toStrings` do? Do they return anything, if so what?

Overrides default, lets us print out objects, otherwise we would only print their memory address. They return Strings, they DON’T PRINT ANYTHING!!