Initial Diagnostic Exercises

SUBMIT HERE as PDF : https://classroom.github.com/a/5Vcmj5A_

The purpose of this assignment is to get a self understanding of your current skills. Keep this assignment for us to discuss if there are any items you face difficulty with.

This assignment is graded on **effort and completeness**, not correctness. If you're unable to solve a problem, write any intermediate steps or related information that you do know. In the worst case, use pseudocode.

Types

1- Evaluate (Java):

- 5.0/2 = **2.5**
- 10 % 3 = **1**
- 3 / 3 + 5 * 3 = ? **16**
- 2/3 = ? **0.6**
- true || false **true**
- "Comp" + "Sci" **CompSci**
- "10" + "-1" **10 -1**
- "Belcalis Marlenis Almanzar".charAt(2) **l**
- String elem = "hydrogen";
  elem.length(); **8**

Conditions

2- What does this code snippet print?

```
flavor = "vanilla";
double price;
switch (flavor) {
case "strawberry":
case "chocolate":
    price = 3.99;
    break;
case "vanilla":
    price = 3.49;
    break;

default:
    price = 0.0;
}
System.out.println("that will be " + price + " please.");
```

that will be 3.49 please.

-

- What would the price be if the flavor was strawberry? **that will be 0.0 please.**
- What is the price for pistachio? **since pistachio is not specified on switch case it would not have a value at all.**

3- Write a condition that is only true if an integer, x, is divisible by 4 or 7.

if (x%4=0) and (x%7=0):
return true;

4- Are these two code snippets different? Why or why not?

```
if (show.funny) {
    System.out.println("This show is funny");
} else if (show.cartoon) {
    System.out.println("This is an animated show.");
} else {
    System.out.println("This is a good show.");
}

// versus

if (show.funny) {
    System.out.println("This show is funny");
}
if (show.cartoon) {
    System.out.println("This is an animated show.");
} else {
    System.out.println("This is a good show.");
}
```

on the first one we have all if else statements connected and therefore it will run trough all of them until it gets to the end of it, on the secondary approach we have the first if separated then we have another if else condition, making two statements that could have the wrong prints, for example, if show.funny it will print:
"This show is funny
This is a good show"
because the second if is a separated statement and it is false so the else will jump in

Loops

5- Create a for loop that prints the *cubes* (x^3) of all integers from -10 to 10

```
for i in range(-10,10):
print(i^3)
```

6- What is the output of this snippet?

```
float score = 0;
while (score < 1) {
    score += .1;
    System.out.println(score);
    if (score == .5) {
        break;
    }
}
```

0.1
0.2
0.3
0.4
0.5

Functions

7- Consider this function

```
private static String  mysteryFn(String input) {
    String output = "";
    for (int i = 0; i < input.length(); i++) {
        if (
                input.charAt(i) == 'a' || input.charAt(i)  == 'e' ||
                input.charAt(i)  == 'i' || input.charAt(i)  == 'o' ||
                input.charAt(i)  =='u'
        ) {
            continue;
        }
        output += input.charAt(i);
    }
    return output;
}
```

- What is the return type? **string**
- What is the parameter type? **string**
- What does it do? **this function will return all vowels from inputted string**
- What is the result of mysteryFn("Woah, we're half way there")
  oaeeaaee
- Is there a case that it does not solve correctly?
  I do not understand why the continue is there if the purpose of the if condi tion is to find the vowels of an string imputted and then store and add that char to outcome, if it was me (thinking) I would have put the add inside the condition and remove the continue since nothing happens there.

Arrays

8- Write the implementation of a function that takes 2 arguments (an int array and two integer indices) and swaps the elements in the two indices of the array.

```
public static void swap(int[] distances, int index1, int index2) {


}
```

we can use when a new location have been set and a new point a and b is needed, this will swap the two points into the new location points.

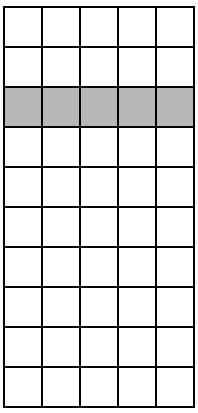
9- Write a code snippet that prints the values in an array **backwards**.

```
for (i = flags.length-1; i >= 0; i--) {
        print(flags[i] + " ',' ");
    }
```

```
char[] flags = {'c', 'f', 'l', 'b', 'a'};
```

10- Write code that prints the values in the 3rd row of this 2D array

```
String[][] classroom = new String[10][5]; // rows x cols
// [... filled in names of students ...]
```



int[] row3rd= new int[]{classroom[3][0], classroom[3][5]};

Objects and Polymorphism

11- Consider this code and the following snippet;

Code:

```
public class Goomba extends Character {
    public static String[] powers = { "side_attack" };

    private int size;

    public Goomba(String name, int size) {
        super(name);
        this.size = size;
    }

    public static void addPower(String newPower) {
        // updates powers static variable to include new power
    }

    public int getSize() {
        return this.size;
    }

}
```

Snippet:

```
Goomba g1 = new Goomba("g1", 10);
Goomba.addPower("climb_walls");
Goomba g2 = new Goomba("g2", 10);
```

- What does the **super** call do?
  call the name from another class which is Character
- What does this.size = size do?
  makes the default size the new size that is a parameter on that public class
- What powers does g1 have at the end of the snippet?
  climb_walls
- What powers does g2 have at the end of the snippet?
  NULL
- System.***out***.println(Goomba.*powers*) prints: [Ljava.lang.String;@6aaa5eb0
  What is this value?

that the string was not printed out correctly, probably because it is an array, not a string value

12-

- What is an interface?
  the ones that are abstract class and uses voids
- What is an abstract class?
  it is a class that is used for agroup, not for creation.
- Why would you use one or the other?
  to organize classes.

I/O

13- Write a snippet that will read from input continuously until the user types 'q'.
(refer to the attached Scanner API if you need to)

```
for (i=0;i<9999999;i++){
    String typed = myObj.nextLine();
    if (typed = 'q'){break;}
}
```

Math Foundations

14- Evaluate or Approximate

If you approximate, indicate if the actual value is greater/less than your approximation.

Example: 1000/999 = little more than 1

25/3 = 7.something

10^-1 = 0.1

2^5 = 32

3^4 = 81

5^2 = 25

82^(.5) = 41, not sure

6! = 1+2+3+4+5+6=21

log(100) = 2

log(1000) = over 2

log(log(10000000000)) = not sure

Recursion

15-

```
// assume x >= 0
public static void mystery1(int x) {
    System.out.print(x % 10);
    if (x / 10 != 0) {
        mystery1(x / 10);
    }
}

// assume x >= 0
public static void mystery2(int x) {
    if (x / 10 != 0) {
        mystery2(x / 10);
    }
    System.out.print(x % 10);
}
```

5678 - 10
50 567.8
67
60
78
70
8

the division will not get to 0, calculating will print on the first one:
567.8
56.78
5.678
0.5678
0.05678
...

What is the value of:

mystery1(5678)?

mystery2(5678)?
