

## Problem Set 1, Part I

1. Select *File->Make a copy...* and save a copy of this template to your Google Drive using the name **ps1\_partI**.
2. Put your answers for Part I in the appropriate locations below.
3. Once you are done with Part I, choose *File->Download->PDF*, and save the file on your machine. The resulting PDF file (**ps1\_partI.pdf**) is the one that you will ultimately submit.

## Problem 1: Java programming basics

1-1)

```
import java.util.*;

public class Program1 {

    /*
     * This method should take an integer x and return:
     *     2x when x is odd
     *     the unchanged value of x when x is even
     */
    public static int double_if_odd(int x)
    {
        if (x % 2 == 1){
            x *= 2;
        }

        return x;
    }

    public static void main(String[] args){
        Scanner scan = new Scanner(System.in);

        System.out.println("Enter an integer x: ");
        int x = scan.nextInt();

        System.out.println("double_if_odd(x) = " + double_if_odd(x));
    }
}
```

1-2)

- a) 17
- b) 15g
- c) 17.0
- d) 7
- e) 7.5
- f) 7.5
- g) 0
- h) 0
- i) "112"
- j) 2"2"

## Problem 2: Conditional execution

2-1)

a)

diamond

pearl

done

b)

ruby

pearl

done

c)

diamond

pearl

done

d)

silver

done

e)

penny

nickel

done

f)

diamond

pearl

done

2-2)

"copper" will never be printed since the following conditions would have to be met:

1-( $a \leq b$ ) [located in first "if"] should be False

2-( $b \geq c$ ) [located in first "else if"] should be True

3-( $!(a > b)$ ) [located in the "if" after the first "else if"] should be True

And as you can see, conditions 1 and 3 can't both be met at the same time.

In addition, "gold" will never be printed since the following conditions would have to be met:

1-( $a \leq b$ ) [located in first "if"] should be False

2-( $b \geq c$ ) [located in first "else if"] should be True

3-( $a < c$ ) [located in the second to last "if" statement] should be True

However, these conditions can't all be met simultaneously since conditions 1 and 2 imply that  $a > b > c$  should be True which can't happen at the same time as  $a < c$  being True.

Finally, "dime" won't be printed since the following conditions would have to be met:

1-( $a \leq b$ ) [located in first "if"] should be False

2-( $a == b$ ) [located in last "if"] should be True

Both conditions can't be met simultaneously. The first condition should be False so that the program moves towards the second-to-last "else" statement. However, if that happens, then the second condition will also be False which means that "nickel" will be printed, not "dime".

### Problem 3: Static methods

3-1

variables that belong to main()

a	b
5	4
3	4
3	7

variables that belong to callMe()

a	b
5	4
5	2
3	2
4	3
4	1
3	1
3	3
3	1
2	1

output (the lines printed by the program)

5 4  
3 2  
3 4  
3 1  
3 7  
2 1  
2  
3 7

**3-2)**

```
public static double average(int a, int b){
    Double avg = (a+b)/2.0;
    return avg;
}
```

#### **Problem 4: Loops**

**4-1)**

```
for (int i = 0; i < 42; i++) {
    System.out.println("I feel loopy!");
}
```

**4-2)**

```
int i=0;
while (i < 30) {
    i += 5;
    System.out.println(i);
}
```

**4-3)**

```
for (int i = 0; i < 4; i++) {
    for (int j = i; j >= 0; j--) {
        System.out.println(i + " " + j);
    }
    System.out.println("--");
}
```

#### **Problem 5: Variable scope**

- 1)a, b
- 2)a, b, i
- 3)a, b, c, i, j
- 4)a, b
- 5)x
- 6)x, y

#### **Problem 6: String objects and their methods**

**6-1**

- a)str2.substring(0, 5) + str1.substring(5)
- b)str1 + str1.charAt(5) + str2
- c)str2.charAt(1) + str2.substring(8)
- d)str1.substring(0,6).toLowerCase() + str2.substring(6).toUpperCase()
- e)str1.charAt(str1.indexOf('e'))
- f)str2.substring(6,10) + str1.substring(3,5)
- g)str1.indexOf('g')
- h)str1.replace('i','o')