

CSE 142 Sample Midterm Exam #1

1. Expressions (15 points)

For each expression in the left-hand column, indicate its value in the right-hand column. Be sure to list a constant of appropriate type (e.g., 7.0 rather than 7 for a double, Strings in quotes, true/false for a boolean).

<u>Expression</u>	<u>Value</u>
$3 * 4 + 5 * 6 + 7 * -2$	_____
$1.5 * 2.0 + (5.5 / 2) + 5 / 4$	_____
$23 \% 5 + 31 / 4 \% 3 - 17 \% (16 \% 10)$	_____
$"1" + 2 + 3 + "4" + 5 * 6 + "7" + (8 + 9)$	_____
$345 / 10 / 3 * 55 / 5 / 6 + 10 / (5 / 2.0)$	_____
$1 / 2 > 0 \ \ 4 == 9 \% 5 \ \ 1 + 1 < 1 - 1$	_____

2. Parameters (20 points)

At the bottom of the page, write the output produced by the following program.

```
public class ParameterMystery {
    public static void main(String[] args) {
        String x = "java";
        String y = "tyler";
        String z = "tv";
        String rugby = "hamburger";
        String java = "donnie";

        hamburger(x, y, z);
        hamburger(z, x, y);
        hamburger("rugby", z, java);
        hamburger(y, rugby, "x");
        hamburger(y, y, "java");
    }

    public static void hamburger(String y, String z, String x) {
        System.out.println(z + "and " + x + " like " + y);
    }
}
```

3. While Loop Simulation (15 points)

For each call of the method below, write the output that is printed:

```
public static void mystery(int i, int j) {
    while (i != 0 && j != 0) {
        i = i / j;
        j = (j - 1) / 2;
        System.out.print(i + " " + j + " ");
    }
    System.out.println(i);
}
```

<u>Method Call</u>	<u>Output</u>
mystery(5, 0);	_____
mystery(3, 2);	_____
mystery(16, 5);	_____
mystery(80, 9);	_____
mystery(1600, 40);	_____

4. Assertions (15 points)

For the following method, identify each of the three assertions in the table below as being either ALWAYS true, NEVER true or SOMETIMES true / sometimes false at each labeled point in the code.

```
public static int mystery(int x) {
    int y = 1;
    int z = 0;

    // Point A
    while (y <= x) {
        // Point B
        y = y * 10;
        z++;

        // Point C
    }

    // Point D
    z--;

    // Point E
    return z;
}
```

	$y > x$	$z < 0$	$z > 0$
Point A			
Point B			
Point C			
Point D			
Point E			

5. Programming (15 points)

Write a static method named `hasMidpoint` that accepts three integers as parameters and returns `true` if one of the integers is the midpoint between the other two integers; that is, if one integer is exactly halfway between them. Your method should return `false` if no such midpoint relationship exists.

Note that the three integers could be passed in any order; the midpoint could be the first, second, or third integer, so you will have to check all of these cases.

Calls such as the following should return `true` :

```
hasMidpoint(4, 6, 8)
hasMidpoint(2, 10, 6)
hasMidpoint(8, 8, 8)
hasMidpoint(25, 10, -5)
```

Calls such as the following should return `false` :

```
hasMidpoint(3, 1, 3)
hasMidpoint(1, 3, 1)
hasMidpoint(21, 9, 58)
hasMidpoint(2, 8, 16)
```

6. Programming (20 points)

Write a static method named `favoriteLetter` that accepts two parameters: a `Scanner` for the console, and a favorite letter represented as a one-letter `String`. The method repeatedly prompts the user until two consecutive words are entered that start with that letter. The method then prints a message showing the last word typed.

You may assume that the user will type a single-word response to each prompt. Your code should be case-sensitive; for example, if the favorite letter is `a`, you should not stop prompting if the user types words that start with an `A`.

For example, the following logs represent the output from two calls to your method: (User input is underlined.)

Call	Scanner console = new Scanner(System.in); favoriteLetter(console, "y");	Scanner console = new Scanner(System.in); favoriteLetter(console, "A");
Output	Looking for two "y" words in a row. Type a word: <u>hi</u> Type a word: <u>bye</u> Type a word: <u>yes</u> Type a word: <u>what?</u> Type a word: <u>yellow</u> Type a word: <u>yippee</u> "y" is for "yippee"	Looking for two "A" words in a row. Type a word: <u>I</u> Type a word: <u>love</u> Type a word: <u>CSE142!</u> Type a word: <u>AND</u> Type a word: <u>PROGRAMS</u> Type a word: <u>are</u> Type a word: <u>always</u> Type a word: <u>Absolutely</u> Type a word: <u>Awesome</u> "A" is for "Awesome"