

QUIZ 1
CMPS 12a - Spring 02
Thomas Raffill

Name: _____
Student ID: _____

This exam is closed book, closed notes, no electronic devices. Show all work. Partial credit given for partial solutions. Presentation counts! Be legible and coherent for full credit.

Question 1: _____ (out of 20)
Question 2: _____ (out of 20)
Question 3: _____ (out of 20)
Question 4: _____ (out of 20)
Question 5: _____ (out of 20)

Total: _____ (out of 100)

Name: _____

1. (20 points)

In the following statement of Java code, list the comment, keyword, identifier, literals, operators and punctuation.

```
int oddSum = 1+3+5+7; // Sum of first 4 odd numbers.
```

- (a) Comment: // Sum of first 4 odd numbers.
- (b) Keyword: int
- (c) Identifier: oddSum
- (d) Literals: 1 3 5 7
- (e) Operators: = +
- (f) Punctuation: ;

2. (20 points)

Consider the following code fragment:

```
int a = 3;  
double b = ++a / 2.0 ;
```

- (a) What is the value of a after this piece of code executes? **Solution:** 4, because of the effect of the increment operator ++.
- (b) What is the value of b after this piece of code executes?

Solution:

The hard part is the second line. The increment operator takes precedence over the division. Since it is in the prefix position, it increments the value of a to 4 and also returns the value 4. Then the division of 4/2.0 returns the value 2.0. Floating point division is used because 2.0 is a double literal, but in this case it makes no difference. Finally (because assignment has the lowest precedence), the result of this is assigned to b. So the answer is 2.0.

Name: _____

3. (20 points)

What, if anything, does the following code fragment print out?

Careful! The “else” belongs to which “if”?

```
int x = 100;
if (x > 5)
    if (x < 10)
        System.out.println("The answer is between five and ten.");
else
    System.out.println("The answer is under five.");
```

Solution:

First, x is assigned the value 100. Then, the first condition $x > 5$ is true. So the second condition $x < 10$ is evaluated. This is false. Therefore, control passes to the “else” clause (which is associated with the second “if” because there are no curly braces to change the association). Therefore, it prints out:
The answer is under five.

Name: _____

4. (20 points)

Write a code fragment which uses a loop to print out the integers from 1 to k in a horizontal line. You can assume that k has already been assigned some value and you don't need to input it.

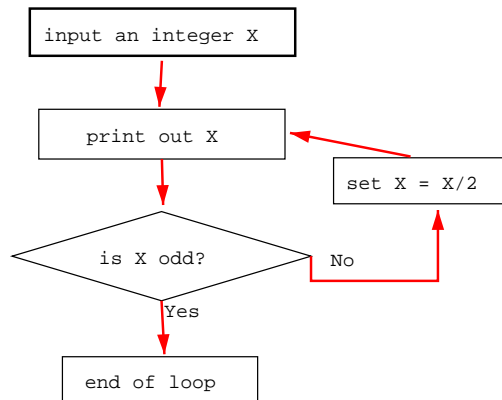
For example, if the value of k is 5, your code fragment should print out:
12345

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

Name: _____

5. (20 points)
Draw a flowchart for the following algorithm:

```
input an integer X
in a loop, do the following:
  print out X
  if X is odd then exit the loop
  otherwise, set X to equal X/2
end of loop
```



Comment: The effect of this algorithm is to compute the largest odd factor in X. It does so by repeatedly dividing out any factor of 2 until the result is odd.