

UNCA CSCI 202
Exam 1 Spring 2012
21 February, 2012

This is a closed book and closed notes exam. This is a 75-minute exam to be given from 8:30 AM to 9:45 AM. Calculators, PDA's, cell phones, and any other electronic or communication devices may not be used during this exam.

Name: _____

If you want partial credit for imperfect answers, explain the reason for your answer!

Problem 1 (11 points)

Complete the `main` method so that it prints your name 2012 times. Your name should be written on a separate line each time.

```
public static void main(String[] args) {  
    // Your code here  
}
```

Problem 2 (9 points)

Suppose there is a class `Match4Exam` with methods with the following headers:

```
public      int   fancyOpA (int x, String y) ;  
public      double fancyOpB (int x, double y) ;  
public static double fancyOpC (int x, int y) ;
```

and that `fancyX` and `fancyY` are objects of type `Match4Exam`.

Write Java statements to do each of the following:

Invoke `fancyOpA`

Invoke `fancyOpB`

Invoke `fancyOpC`

Problem 3 (21 points)

The table below contains two columns. The leftmost column is a Java expression. In the rightmost column write the value of the expression as a C Java literal. If the value is a double or a boolean be sure to use the Java syntax for writing doubles or booleans. Some of these are tricky, but none require complex arithmetic.

(int) 3.14	
5 * 2 / 5	
5 * (2 / 5)	
(5 * 2) / 5	
2.5 * (2 / 5)	
(2.5 * 2) / 5	
3 % 2	
3 >= 5	
3 != 5	
! (3 < 4)	
! true	
true == true	
true false	
true && false	

Problem 4 (14 points)

Write a static recursive method power to compute x^n , where both x and n are integers, using the following recursive formula:

$$x^0 = 1$$

$$x^n = x * x^{n-1}, \text{ if } n > 0$$

Your answer **must** have appropriate headers for your power method.

This problem based on Exercise 18b on page 193 of the textbook.

Problem 5 (45 points)

In this problem you are going to explore the creation and use of a class called `Pair4Exam`.

Write your answers on the lined paper provided by the instructor.

The definition of the class begins as follows:

```
public class Pair4Exam {  
    private int valueAny ;  
    private int valuePos ;
```

Subproblem 5A (6 points)

Write a *default* constructor that takes no arguments and returns a `Pair4Exam` object where both fields `valueAny` and `valuePos` have the value zero.

Subproblem 5B (3 points)

Write a single Java statement that creates a variable `sampA` of type `Pair4Exam` using the default constructor you defined in Subproblem 5A.

Subproblem 5C (6 points)

Write appropriate mutator (set) and accessor (get) methods for the field variable `valueAny` of `Pair4Exam`.

Subproblem 5D (3 points)

Write a single Java statement that calls the mutator method you defined in Subproblem 5C to set the `valueAny` field of the object `sampA` of Subproblem 5B to 202.

Subproblem 5E (3 points)

Write a single Java statement that doubles the value stored in the `valueAny` field of `sampA`. Use the methods you defined in Subproblem 5C in your answer.

Subproblem 5F (6 points)

Now write an appropriate mutator (set) method for setting the field variable `valuePos`; however, this time have your method throw the exception `IllegalArgumentException` if the method is called with a negative value.

Subproblem 5G (6 points)

Assume that `x` is an integer variable, but you don't know if its value is positive or negative. Write a small section of Java code to set the `valuePos` field of `sampA` to `x` using the mutator method you wrote for Subproblem 5F. Should this action throw `IllegalArgumentException`, catch the exception and set the `valuePos` field of `sampA` to 0.

Subproblem 5H (6 points)

Write a `Pair4Exam` method called `sumUp` that returns the sum of the two fields of `Pair4Exam`.

Subproblem 5I (6 points)

Write a `Pair4Exam` method that doubles the value of both fields of `Pair4Exam`. This method should return no values.