


EXAM 2 PROGRAMMING December 2008 COMPUTING ENGINEERING Leganés		 Universidad Carlos III de Madrid	
Surname(s)		Name	
Signature		NIA	Group

READ THESE INSTRUCTIONS CAREFULLY BEFORE YOU BEGIN WITH THE EXAM:

- Fill in all the sheets with a blue or black pen, both the personal information and the answers.
- Make sure that you have provided your NIA and the actual group you belong to.
- You have one hour to complete the exam.
- During the exam the only materials allowed on the table is the exam paper and the pen.
- Use only the exam sheets for your answers. Any additional papers will not be collected.

Part 1: Questions

Question 1 (1 mark).- Indicate whether the following statement is correct, and briefly explain why.

“The following is a valid constructor declaration.”

```
class Inverse {
    public void Inverse () {}
}
```

Question 2 (1 mark).- Indicate whether the following statement is correct and briefly explain why.

"A variable declared as protected is visible outside the class"

Question 3 (1 mark).- Why the value of n2 is 3 and not 4? How can we correct the code?

```
public class Main {  
    public static void main (String [] args) {  
        Counter n1 = new Counter ();  
        Counter n2 = new Counter ();  
        n2.print ();  
    }  
}  
  
class Counter {  
    private int c = 2;  
    public Counter () {  
        c += 1;  
    }  
  
    public void print () {  
        System.out.println ("Result: " + c);  
    }  
}
```

Question 4 (1 mark).- Find the errors in the following code and suggest a way of resolving them.

```
public class Main {  
    public static void main (String [] args) {  
        Question n1 = new Question (1, 'c');  
    }  
}  
  
class Question {  
    int a = 0;  
    static char c;  
  
    public Question (int a, char c) {  
        this.a = a;  
        Question.c = c;  
    }  
  
    public void Question (char c, int a) {  
        this.a = a;  
        this.c = c;  
    }  
}
```

Question 5 (1 mark).- In which ways do a generic method and a constructor defer?

Question 6 (1 mark).- What does the term “class instantiation” describe?

Question 7 (1 mark).- How are arguments passed to methods? What is the value of x after executing the following code?

```
public class Main {  
    public static void main (String [] args) {  
        Flip f = new Flip ();  
        boolean x = true;  
        f.flip (x);  
    }  
}  
  
class Flip {  
    public void flip (boolean x) {  
        x = !x;  
    }  
}
```

Question 8 (1 mark).- What is the difference between the methods foo and bar of the following code?

```
public class Main {  
    public static void main (String [] args) {  
        Question q = new Question ();  
    }  
}  
  
class Question {  
    public static void foo () {}  
    public void bar () {}  
}
```

PART 2: PROBLEMS

Problem 1 (2 marks).- Write a function which given two sets of integers returns a set of all the elements that the previous two sets have in common (i.e. their intersection). For example

```
Intersection in = new Intersection ();  
int [] a = {1,2,3,4,5};  
int [] b = {2,10,4};  
int [] d = {20};  
int [] foo = in.intersection (a,b);  
int [] bar = in.intersection (b,d);
```

The value of *foo* should be {2,4}, while the value of *bar* should an empty array {}.