

# ESC101 : Fundamental of computing

## Tutorial sheet 8

16 October, 2008

Topics covered :

1. Distinction between static and non-static methods.
2. Arrays

I have given a nice lab assignment in this week which will help the student appreciate the importance of object oriented programming and clarify their doubts about access control and static versus non-static methods. So unless some student specifically asks some doubt, you should not discuss the distinction between static and non-static method and access control. Please discuss the following problems about references to objects and arrays. In the last 15 minutes, distribute the copies of the quiz2 and 2nd mid semester exam. Ask the students to write any request for rechecking on the front page of the copy before returning the copy to you. Announce that **No request for rechecking will be entertained** after the tutorial class is over.

1. Based on the marks of the 2nd mid semester exam, I feel that the students lack understanding of reference to objects, in particular, passing references to objects as parameters in methods. Most of the students got very less marks in 2nd question which was based on this concept. This is inspite of the fact that I had given one similar question in the Tutorial sheet 7. So please solve the 2nd problem of the mid semester exam with full explanation in the tutorial. The exam and its solution is already available on the course webpage.

2. **Reference to and creation of Arrays** Please clarify any doubt in the following statements :

```
int[] A = new int[10];
Point[] Poly = new Point[100];
```

here Point is a class which has been discussed extensively in lectures and lab assignments. Emphasize that A is a reference to an array object. Explain what happens when we write  $A = B$  where A and B are references to arrays of same type. What will be the output of the following program ?

```
class Array_example
{
    public static void Add(int[] A, int[] B)
    {
        for(int i = 0; i < A.length; i=i+1)
            A[i]=A[i]+B[i];
    }

    public static int[] Multiply(int[] A, int[] B)
    {
        for(int i = 0; i < A.length; i=i+1)
            B[i] = B[i]*A[i];
        return B;
    }

    public static void main(String args[])
    {
        int[] A = {0,10,20,30,40};
        int[] B = {0,1,2,3,4};
        Add(A,B);
        for(int i=0; i < A.length; i=i+1)
            System.out.println("A["+i+"]="+A[i]+", B["+i+"]="+B[i]);
        A = Multiply(A,B);
        for(int i=0; i < A.length; i=i+1)
            System.out.println("A["+i+"]="+A[i]+", B["+i+"]="+B[i]);
    }
}
```

3. **(Application of arrays : Sieve of Eratosthenes)**

If time permits, discuss the following problem. Consider the problem of finding all primes less than or equal to an integer  $n$ . The students can solve this problem by checking primality of  $i \leq n$  separately. Now discuss the algorithm based on *Sieve of Eratosthenes* which uses array to solve this problem. Try to design the solution interactively. Ask the students about the advantage of this array base solution.