Computer Science & Information Systems

**DESIGN AND ANALYSIS OF ALGORITHMS – Lab Sheet # 2**

1. **Objective**:

The students will be able to merge multiple list in linear time.

1. **Problem:** (**Voting in Siruseri**)

Elections are on for the Siruseri Town Council. Elections in Siruseri work in a rather odd manner. Each candidate is assigned a unique identification number. The town is divided into five zones and each zone proposes a list of candidates, in some arbitrary order, that it would like to nominate to the Council. Any candidate who is proposed by three or more zones is elected. There is no lower limit or upper limit on the size of the Council.

Your task is to calculate how many candidates are elected to the Council, given the lists proposed by the five zones.

For example, suppose the candidates proposed by the five zones are as follows:

*Zone 1:* [12, 387, 15, 162, 5]

*Zone 2:* [14, 162, 92, 387, 7, 748]

*Zone 3:* [14, 5, 12, 387]

*Zone 4:* [17, 952, 12, 92, 398, 849]

*Zone 5:* [14, 5, 92, 12, 387]

In this example, 5 candidates are elected: these are [12, 387, 5, 14, 92]..

1. **Solution hint**

Sort each list and then do a 5-way merge.

1. **Input format**

The first line of the input contains five integers *N1*, *N2 N3*, *N4* and *N5*, where *Nj* is the number of candidates proposed by zone *j*, 1 ≤ *j* ≤ 5. This is followed by five lines of space separated integers. For 1 ≤ *j* ≤ 5, line *j*+1 of the input has *Nj* integers representing the list of candidates proposed by zone *j*.

1. **Output format**

Your output should be a single line consisting of one integer, the total number of candidates elected to the Town Council.

1. **Test data**

In all cases, 1 ≤ N1, N2, N3, N4, N5 ≤ 50,000. Each candidate ID is between 1 and 50,000. Also, each individual list is guaranteed to be free of duplicate entries.

1. **Sample input**

5 6 4 6 5

12 387 15 162 5

14 162 92 387 7 748

14 5 12 387

17 952 12 92 398 849

14 5 92 12 387

1. **Sample output**

5

1. **References**

*Zonal Computing Olympiad 2010*