

## 1997 Paper 3 Question 5

### Data Structures and Algorithms

You are given two sets of numbers  $X_i$  and  $Y_j$ , where  $i$  and  $j$  run from 1 to  $N$ .

Devise an algorithm to find the  $M$  largest values of  $X_i - Y_j$ . This algorithm should not be quadratic in  $N$ , though it is permitted to be quadratic in  $M$ .

You should regard  $N$  as being of the order of 20,000 and  $M$  as being of the order of 1,000.

[20 marks]