ESC101 : Fundamental of Computing

Lab 9 for 22 October 2008

Maximum Marks = 10

1. (marks=4) Create an array A of length $2n + 1$ which will store integers, the value of n is to be provided from command line. Fill the array with random integers from range 0 to 1000. Print the array A. Rearrange the elements of A so that

   - $A[n]$ stores the smallest element.
   - $A[n - 1]$ stores the second smallest element
   - $A[n + 1]$ stores the third smallest element
   - and so on ...

   And finally print the elements of A. For example, if initially A is $\{13, 8, 9, 2, 17, 100, 1, 4, 6\}$. Then after rearrangement it should become $\{17, 9, 6, 2, 1, 4, 8, 13, 100\}$.

2. (marks = 6) The aim of this exercise is to experimentally find out the approximate minimum distance between points when we select n points randomly uniformly in a given interval.

   Create an array A of n Points in 2D space. The value of n has to be provided from command line. Now create these n points randomly by selecting their x and y coordinates from the range 0 to 400, and store their references in A.

   - Compute the minimum distance between any pair of points for values of n from set $\{20, 50, 100, 300, 400, 500, 600, 1000\}$.
   - Experimentally try to find the approximate value of n for which the minimum pairwise distance becomes less than 10.

   You should run your experiment multiple times for a single value of n to make meaningful observations and inferences.