THE MEDIAN PROBLEM: A SORTING APPLICATION

Introduction

1. The median of the following set of Math marks 56,67,71,79,83 is 71

2. The median of the following set of Math marks 47,56,60,70,79,86 is 65

Definition

The median of a set of ***ordered*** data is that particular observation, which has half the observations above it and half below it.

Problems

Find the median of the following sets of observations

1. 5,7,13,18,27
2. 13,18,26,30,34,40
3. 7,4,5,12,3,15,2

Why Do We Use Median

It is often a better indicator of central tendency than the average (MEAN)

Examples: A: 10,20,35,35,40,45,50,50,55,70
B: 10,20,35,35,40,45,50,50,55,1000

The mean of A=41 and the median of A=42.5
The mean of B=134 and the median of B=42.5

Program Development

1. How will we store the data ?
   Lets use an array X, which will have data stored as X(1),X(2),X(3),...X(N) where the data must be in some sorted order (ascending lets say)
2. How do we get the data into ascending order ?
   Use a sorting routine (exchange sort or shell sort)
3. Having X(1)...X(N) how do we obtain the median?
   a) Case 1 (N is odd)-> Median = $X(\frac{N+1}{2})$
   b) Case 2 (N is even) -> Median = $(X(\frac{N}{2}) + X(\frac{N+2}{2})) / 2$

Your Assignment

Develop a program which determines the median of set of data. The data is to be read in from a data file called median.txt. It contains a set of marks. The exact appearance of the program can be seen by executing the file median.exe