Programming assignment 7

CSCI 201 [1,3] Fall 2002

Due Wednesday, December 11, 2002

Objective: This assignment is designed to exercise your facility with one and two dimensional arrays.

Problem: Design a program which reads daily temperature lows for a year from a text file, computes summary statistics from the file, and then writes its contents and its summary statistics to another text file.

Specifications:

1. Copy the temperature file from ~cs201400/FAl1965.txt to your directory

2. Your program will:

   (a) read in the file

   (b) print the file to the output changing the month numbers in the top line to the respective three character month names. Also, print the 999 values, which indicate no day of that month in the table, as a triple of asterisks.

   (c) under each month, your program will print that month's:
       i. minimum
       ii. maximum
       iii. arithmetic mean (average)
       iv. standard deviation
       v. median
       vi. mode

   (d) In the first column, your program will print the labels for the above statistics

   (e) On lines following the above statistics, your program will print, with adequate labeling, the global statistics for the file (e.g. maximum temp. for the year)

3. You will then turn in a typescript of the program source and the output file.

Notes:

- The standard deviation, σ, is derived from the arithmetic mean, $\overline{x}$, using the following formula:

$$\sigma = \sqrt{\frac{1}{n-1}\left(\sum_{i=1}^{n}(x_i - \overline{x})^2\right)}$$

- The months have different counts of days. You can use the 999 values of extra days in the month as a sentinel, but don't include them in your calculations. The n in the above formula and the formulae for the other statistics will represent the number of actual days in each respective month, or the number of days in the year.

- The mode and median are described in problem 8-36 in the text. You may use any sort in computing the median.