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1: // Author: Wayne Buchner
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4: // Program: Median.pas
5: // Description: Calculate the Median value from an array
6:
7: program Stats;
8:
9: uses SysUtils,math;
10:
11: // function to calculate the sum of an array
12: function SumArray(const list : array of Double):Double;
13: var
14:     i : Integer;
15: begin
16:     result := 0;
17:     for i := Low(list) to High(list) do
18:         begin
19:             result := result + list[i];
20:         end;
21: end;
22:
23: // function to calculate the mean value of an array
24: function CalculateMean(const list : array of Double):Double;
25: begin
26:     result := SumArray(list)/Length(list);
27: end;
28:
29: Function ReadString(prompt : String):String;
30: begin
31:     Write(prompt);
32:     ReadLn(result);
33: end;
34:
35: // calculates the maximum value in an array and returns it
36: function CalculateMax(const list : array of Double):Double;
37: var
38:     i : Integer;
39: begin
40:     result := 0;
41:     for i := Low(list) to High(list) do
42:         begin
43:             if result < list[i] then
44:                 begin
45:                     result := list[i];
46:                 end;
47:         end;
48: end;
49:
50: function CalculateStdDev(var list : array of Double):Double;
51: var
52:     i : Integer;
53:     temp : Double;
54: begin
55:     temp := CalculateMean(list);
56:     for i := Low(list) to High(list) do
57:         begin
58:             list[i] := list[i]-temp;
59:             list[i] := list[i]*list[i];
60:         end;
61:     result := Sqrt(SumArray(list)/(Length(list)-1));
62: end;
63:
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64: // reads the prompt from the user and returns it.
65: function ReadDouble(prompt: String): Double;
66: var
67:     temp: String;
68: begin
69:     temp := ReadString(prompt);
70:     while not TryStrToFloat(temp, result) do
71:         begin
72:             WriteLn('Please enter a real number ');
73:             temp := ReadString(prompt);
74:         end;
75: end;
76:
77: // populates the stats array
78: procedure PopulateStats(var list : array of Double);
79: var
80:     temp : Double;
81:     i : Integer;
82: begin
83:     for i := Low(list) to High(list) do
84:         begin
85:             temp := ReadDouble('Enter a value : ');
86:             list[i] := temp;
87:         end;
88: end;
89:
90: procedure PrintStats(const list : array of Double);
91: var
92:     i: Integer;
93: begin
94:     for i := Low(list) to High(list) do
95:         begin
96:             WriteLn(i+1, ' ',list[i]:4:2);
97:         end;
98: end;
99:
100: procedure Main();
101: var
102:     stats : array [0..9] of Double;
103: begin
104:     PopulateStats(stats);
105:     WriteLn();
106:     WriteLn('Calculating totals...');
107:     WriteLn();
108:     WriteLn('Sum ',sum(stats):8:2);
109:     WriteLn('Mean ',Mean(stats):8:2);
110:     WriteLn('Max ',MaxValue(stats):8:2);
111:     WriteLn('Stddev ',StdDev(stats):8:2);
112:     WriteLn();
113:     WriteLn('Home Made Functions');
114:     WriteLn('SumArray', SumArray(stats):8:2);
115:     WriteLn('CalculateMean ',CalculateMean(stats):8:2);
116:     WriteLn('CalculateMax ',CalculateMax(stats):8:2);
117:     WriteLn('CalculateStdDev ',CalculateStdDev(stats):8:2);
118:
119: end;
120:
121: begin
122:     Main();
123: end.
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