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1  program HeapSort240616;
2
3  {
4  *
5  * Aluno: Wellington de Souza Silva
6  *
7  *}
8
9  const
10     MAX = 10;
11
12  type
13     Tgiven = integer;
14     Tvector = array[0..MAX] of Tgiven;
15
16  var
17     vector : Tvector;
18
19  procedure auto(var vector:Tvector);
20  var
21     i : integer;
22  begin
23     for i := 0 to MAX-1 do
24     begin
25         vector[i]:=random(150);
26     end;
27 end;
28
29 procedure display( vector: Tvector );
30 var
31     i: integer;
32 begin
33     writeln;
34     write('=>   | ');
35     for i := 0 to MAX-1 do write(vector[i], ' | ');
36     writeln;
37 end;
38
39 procedure swap( var a, b: integer );
40 var
41     temp: integer;
42 begin
43     temp := a;
44     a := b;
45     b := temp;
46 end;
47
48 procedure sink( var vector : Tvector; start, last: integer );
49 var
50     root, child: integer;
51 begin
52     root := start;
53     while ( root * 2 + 1 <= last ) do begin
54         child := root * 2 + 1;
55         if ( child < last ) and ( vector[child] < vector[child + 1] ) then
56             child := child + 1;
57         if ( vector[root] < vector[child] ) then begin
58             swap ( vector[root], vector[child] );
59             root := child;
60         end else
61             break;
62         end;
63 end;
64
65 procedure heighten( var vector : Tvector; count: integer );
66 var
67     start: integer;
68 begin
69     start := (count - 1) div 2;
70     while ( start >= 0 ) do
71     begin
72         sink (vector, start, count-1);
73         start := start - 1;

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74     end;
75 end;
76
77 procedure heapSort( var vector : Tvector; lastVector:integer );
78 var
79     last : integer;
80 begin
81     heighten(vector, MAX );
82     last := MAX - 1;
83     writeln;
84     writeln('Heap');
85     display(vector);
86     while ( last > 0 ) do
87     begin
88         swap(vector[last], vector[0]);
89         last := last - 1;
90         sink(vector, 0, last);
91     end;
92 end;
93
94 //program
95 begin
96     writeln;
97     auto(vector);
98     writeln('Original Vector');
99     display(vector);
100    heapSort (vector, MAX);
101    writeln;
102    writeln('Sorted Vector');
103    display(vector);
104 end.
105

```