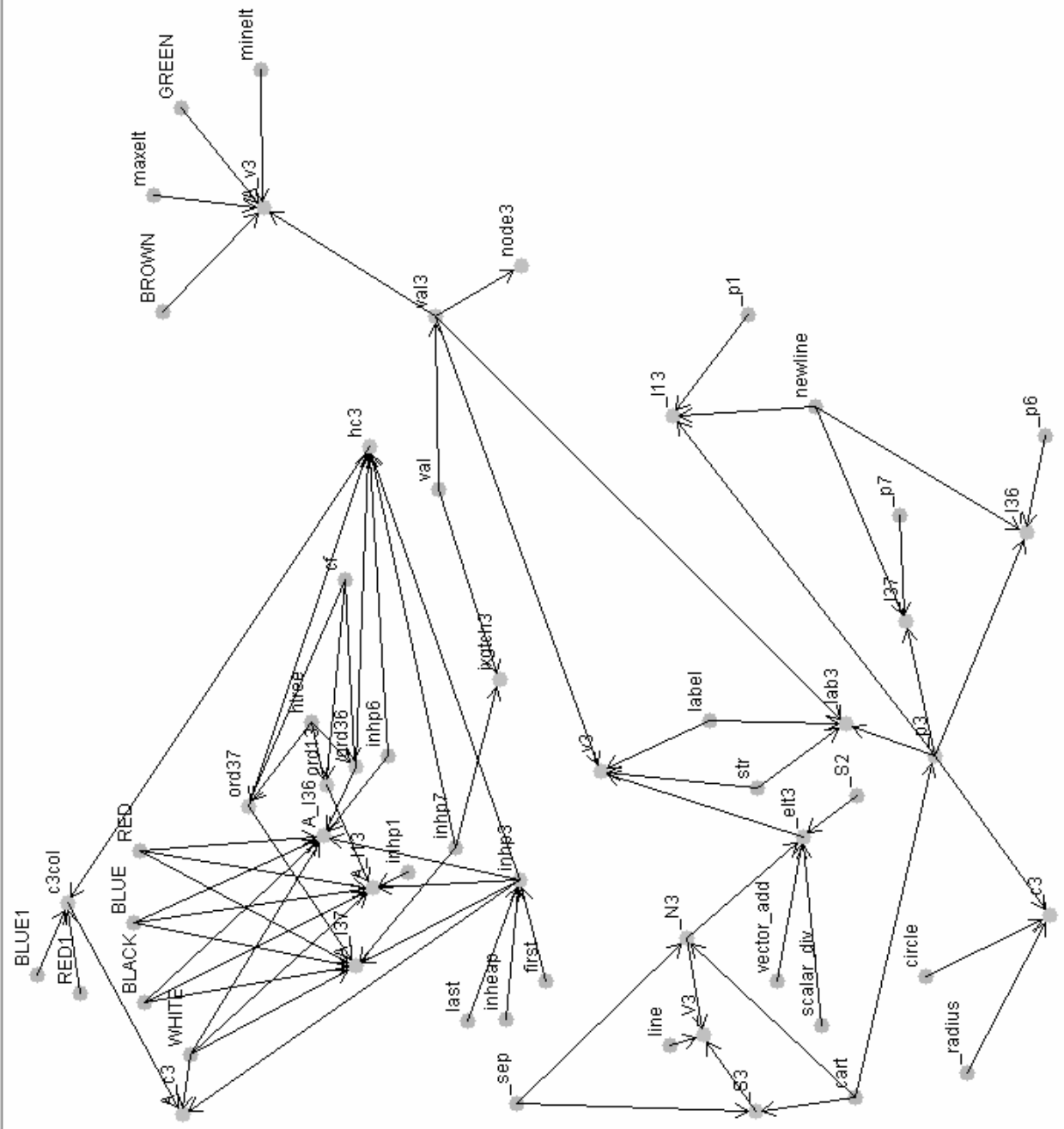
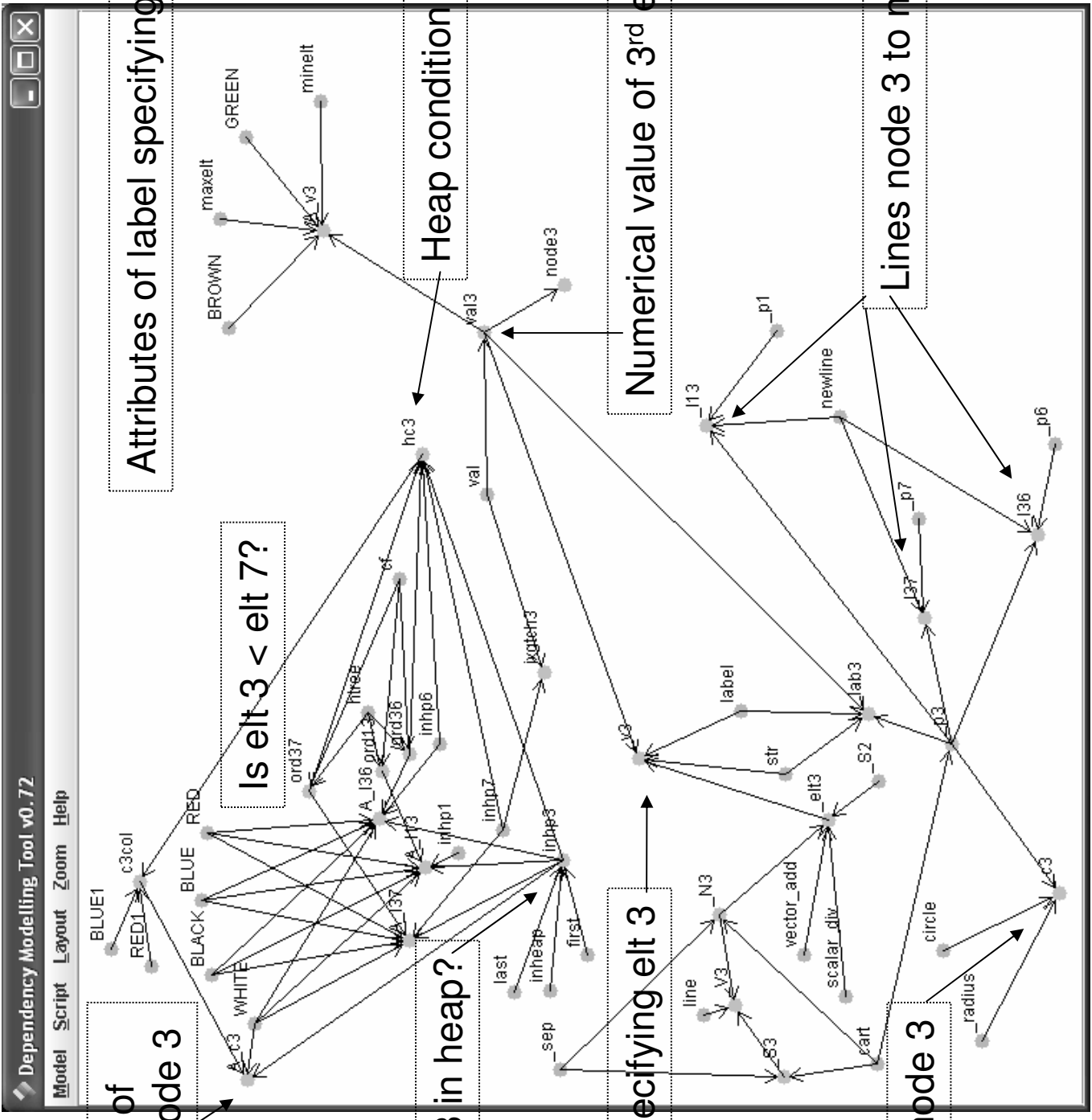




Dependency Modelling Tool v0.72

Model Script Layout Zoom Help





Attributes of circle at node 3

Attributes of label specifying element 3

Is elt 3 < elt 7?

Is node 3 in heap?

Heap condition at node 3?

Label specifying elt 3

Numerical value of 3rd element

Circle at node 3

Lines node 3 to nodes 1,6,7



Figure 1: Unsorted array of elements

auto-HEAP

Label specifying elt 3

Numerical value of 3rd element

Attributes of label specifying element 3

Is elt 3 < elt 7?

Heap condition at node 3?

Attributes of circle at node 3

19

46

56

Is node 3 in heap?

Circle at node 3

21

7

3

90

Lines node 3 to nodes 1,6,7

Figure 2: Heap representation for the array in Figure 1

screen

Formal annotation

Phase I: HEAP ESTABLISHMENT

A formal specification

Observation of abstract state

Function variant: first
first : 3

Loop Invariant

1. $(1 \leq \text{first} \leq \text{MaxElt}) \ \&\&$

2. $\text{Heap}(\text{first}, \text{MaxElt}) = 0$

Shuffle

Reshuffle

PRE: $\text{Heap}(\text{first} + 1, \text{MaxElt})$

Function variant: currix
currix : 3

Loop invariant

1. $(\text{first} \leq \text{currix} \leq \text{MaxElt}) \ \&\&$

2. $\text{Allhp}(\text{first} + 1, \text{MaxElt})$

POST: $\text{Heap}(\text{first}, \text{MaxElt})$

exchange(3, 6)

Figure 1: Unsorted array of elements

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
7	56	19	23	89	46	2	54	21	12	7	3	12	45	

Figure 2: Heap representation for the array in Figure 1

semi-auto mode

automatic mode

include a formal specification

index off

Figure 6-1: An extended version of heapsort with its formal specification