

**Unit requirements** Create  $n$  services  $s_1, \dots, s_n$  with size 1 (where  $n$  is the number of nodes in the current graph), set the maximum ensemble size to 1 and assign service  $s_i$  as the requirement and  $\{s_i\}$  as the single ensemble of node  $v_i$  for  $i = 1, \dots, n$ . This allows to solve standard clique and graph coloring problems using the maxclique and coloring tools.

**Random requirements** Assign between  $r_1$  and  $r_2$  random services to each node of the graph.

**Random areas** Create requirements by assigning to each service a random supply area of size between  $n_1$  and  $n_2$ .

**Connected areas** Create requirements by assigning to each service a random connected supply area of size between  $n_1$  and  $n_2$ . This operation uses a process which first selects a node at random and then proceeds to choose random additional nodes connected by an edge to at least one of the already selected nodes, until either the requested random number  $n : n_1 \leq n \leq n_2$  of nodes have been selected or the current connected component has been exhausted (note that in the latter case the supply area may actually have a size  $< n_1$ ).

**Reorder services...** Pop up a panel which allows to change the current order of services.

### 14.3 Mark Submenu

This menu contains operations for marking and unmarking nodes. Note that some operations described in the following sections make use of the set of currently marked nodes.

**Mark all** Mark all nodes.

**Unmark all** Unmark all nodes.

**Toggle all** Toggle all nodes (mark unmarked nodes and vice versa).

**Mark unsupplied nodes** Mark all nodes which have no requirements.

**Mark unassigned nodes** Mark all nodes which have an empty ensemble list.

**Mark service areas...** Pop up a panel which allows to mark service supply areas. Besides simply marking the area or its complement, one can also compute the intersection or union with the currently marked area.

**Mark ensemble areas...** Pop up a panel which allows to mark ensemble supply areas. These are defined analogously to the service supply areas, i.e., the area of an ensemble  $B$  is the set of all nodes  $v$  with  $B \in \mathcal{B}_v$ . The controls are the same as for ‘Mark service areas...’.