Console

Startup execution:
  loading initial environment

Start NARVAL
                Load macros
                Load help

-->atomsLoad("narval");
 !--error 10000
atomsLoad: Module 'narval' is not installed.
at line   95 of function atomsLoad called by :
atomsLoad("narval");

-->

-->disp("==");

  ==

-->disp("   TASK 1 : BASIC ANALYSIS   ");

                  TASK 1 : BASIC ANALYSIS

-->disp("==");

  ==

-->

-->L = 1000;

-->dmax = 150;

-->win = 1;

-->

-->nodes = [100 200 300];

-->timeTask1 = zeros(1,length(nodes));

```
-->

-->for k = 1:length(nodes)
-->
-->    n = nodes(k);
-->
-->    // Generate topology
-->    g = NL_T_LocalityConnex(n, L, dmax);
-->
-->    // Show topology
-->    scf(win);
-->    clf;
-->     NL_G_ShowGraphN(g, win);
-->    xtitle("Task 1 Topology with "+string(n)+" Nodes");
-->    win = win + 1;
-->
-->     // Measure congestion time (5 runs average)
-->    t = zeros(1,5);
-->    for i = 1:5
-->        timer();
-->         NL_C_Congestion(g);    // congestion function
-->        t(i) = timer();
-->    end
-->
-->    timeTask1(k) = mean(t);
-->
-->    // Print time
-->    mprintf("\nNodes: %d\n", n);
-->     mprintf("Average Congestion Time: %f seconds\n", timeTask1(k));
-->    mprintf("---------------------------------------\n");
-->
-->end
                              !--error 4
Undefined  variable:  NL_C_Congestion


-->

-->// Plot comparison

-->scf(win);

-->plot(nodes, timeTask1, '-bo');

-->xtitle("Task 1: Congestion Time Comparison");
```

```
-->xlabel("Number of Nodes");

-->ylabel("Time (seconds)");

-->legend("Congestion Time");

-->atomsLoad("narval");
 !--error  10000
atomsLoad: Module 'narval' is not installed.
at line       95 of function atomsLoad called by :
atomsLoad("narval");


-->

-->disp("==================================================
======");

  ================================================
                              ========

-->disp("         TASK 2 : CONGESTION CONTROL ANALYSIS       ");

          TASK 2 : CONGESTION CONTROL ANALYSIS


-->disp("==================================================
======");

  ================================================
                              ========

-->

-->L = 1000;

-->dmax = 150;

-->win = 10;   // start new window index

-->

-->////////////////////////////////////////////////////////////

-->/////////////////PART 1 : 200 & 300//////////////////////
```

```
-->////////////////////////////////////////////////////////

-->

-->sizes = [200 300];

-->timePart1  =  zeros(1,length(sizes));

-->

-->for k = 1:length(sizes)
-->
-->    n = sizes(k);
-->
-->    g = NL_T_LocalityConnex(n, L, dmax);
-->
-->    scf(win);
-->    clf;
-->     NL_G_ShowGraphN(g, win);
-->    xtitle("Topology with "+string(n)+" Nodes");
-->    win = win + 1;
-->
-->    t = zeros(1,5);
-->    for i = 1:5
-->        timer();
-->         NL_C_Congestion(g);
-->        t(i) = timer();
-->    end
-->
-->    timePart1(k) = mean(t);
-->
-->    mprintf("\nNodes: %d\n", n);
-->     mprintf("Average Congestion Time: %f seconds\n", timePart1(k));
-->    mprintf("---------------------------------------\n");
-->
-->end
                              !--error 4
Undefined  variable:  NL_C_Congestion


-->

-->// Plot comparison

-->scf(win);
```

```
-->plot(sizes, timePart1, '-ro');

-->xtitle("200 vs 300 Node Comparison");

-->xlabel("Number of Nodes");

-->ylabel("Time (seconds)");

-->legend("Congestion Time");

-->win = win + 1;

-->

-->

-->//////////////////////////////////////////////////////////

-->////////////////PART2:500(5METHODS)//////////////////

-->//////////////////////////////////////////////////////////

-->

-->methods = ["Locality","Random","Grid","SmallWorld","ScaleFree"];

-->time500 = zeros(1,5);

-->

-->for i = 1:5
-->
-->    select i
-->    case 1 then g = NL_T_LocalityConnex(500,L,dmax);
-->    case 2 then g = NL_T_Random(500,L);
-->    case 3 then g = NL_T_Grid(500,L);
-->    case 4 then g = NL_T_SmallWorld(500);
-->    case 5 then g = NL_T_ScaleFree(500);
-->    end
-->
-->    scf(win);
-->    clf;
-->    NL_G_ShowGraphN(g, win);
-->    xtitle(methods(i)+" Topology (500 Nodes)");
-->    win = win + 1;
-->
```

```
-->    t = zeros(1,5);
-->    for j = 1:5
-->        timer();
-->         NL_C_Congestion(g);
-->        t(j) = timer();
-->    end
-->
-->    time500(i) = mean(t);
-->
-->    mprintf("\n%s Topology (500 Nodes)\n", methods(i));
-->    mprintf("Average Congestion Time: %f seconds\n", time500(i));
-->    mprintf("---------------------------------------\n");
-->
-->end
 !--error  999
get: The handle is not or no more valid.
at line       16 of function generic_i_h called by :
at line        2 of function %s_i_h called by :
at line       35 of function NL_G_ShowGraph called by :
at line       10 of function NL_G_ShowGraphN called by :
    NL_G_ShowGraphN(g, win);


-->

-->// Plot method comparison

-->scf(win);

-->bar(time500);

-->xtitle("500 Node Method Comparison");

-->xlabel("Topology Method");

-->ylabel("Time (seconds)");

-->win = win + 1;

-->

-->

-->////////////////////////////////////////////////////////

-->////////////////PART3:NODEREDUCTION//////////////////
```

```
-->//////////////////////////////////////////////////////////

-->

-->reduceSizes = [500 400 300 200 100];

-->timeReduce  =  zeros(1,length(reduceSizes));

-->

-->for k = 1:length(reduceSizes)
-->
-->    n = reduceSizes(k);
-->
-->    g = NL_T_LocalityConnex(n, L, dmax);
-->
-->    scf(win);
-->    clf;
-->     NL_G_ShowGraphN(g, win);
-->     xtitle("Reduced Network with "+string(n)+" Nodes");
-->     win = win + 1;
-->
-->    t = zeros(1,5);
-->    for i = 1:5
-->        timer();
-->         NL_C_Congestion(g);
-->        t(i) = timer();
-->    end
-->
-->     timeReduce(k) = mean(t);
-->
-->     mprintf("\nReduced Nodes: %d\n", n);
-->     mprintf("Average Congestion Time: %f seconds\n", timeReduce(k));
-->     mprintf("---------------------------------------\n");
-->
-->end
 !--error  999
get: The handle is not or no more valid.
at line       16 of function generic_i_h called by :
at line        2 of function %s_i_h called by :
at line       35 of function NL_G_ShowGraph called by :
at line       10 of function NL_G_ShowGraphN called by :
    NL_G_ShowGraphN(g, win);
```

```
-->

-->// Plot reduction comparison

-->scf(win);

-->plot(reduceSizes, timeReduce, '-g*');

-->xtitle("Node Reduction vs Congestion Time");

-->xlabel("Number of Nodes");

-->ylabel("Time (seconds)");

-->legend("Congestion Time");

-->

-->disp
  !--error 42
Incompatible input argument.
```