% make\_n5\_mECs.m

%

% This script makes a cell array mEC of the motif equivalence classes (mECs)

% where mEC{k} gives the graph numbers (for n5\_digraphs.mat) of the graphs

% in that mEC. It also creates mEC\_label that describes the class, mEC\_notes with

% special information about the classes, mEC\_start which lists the first graph in

% mEC and mEC\_end which lists the last graph of the mEC.

% Data saved as: save('n5\_mECs.mat', 'mEC', 'mEC\_label','mEC\_notes', 'mEC\_core\_motifs', 'mEC\_start', 'mEC\_end', 'mECs\_missing\_att', 'graphs\_missing\_att', 'mECs\_param\_dep', 'graphs\_param\_dep')

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Initialize cell arrays that may end up with some entries empty:

mEC\_notes = cell(155,1); % this will store any special notes about certain mECs

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

mEC{1} = [ 1 ];

mEC\_label{1} = 'mEC 1: 5-cycle (core motif), Group I-A (graph 1)';

mEC\_core\_motifs{1} = '{ [1 2 3 4 5] }';

mEC{2} = [ 2 ];

mEC\_label{2} = 'mEC 2: 5-star (core motif), Group I-A (graph 2)';

mEC\_core\_motifs{2} = '{ [1 2 3 4 5] }';

mEC\_notes{2} = 'The Gaudi attractor appears as a 2nd attractor for eps = 0.095, delta = 0.11 and for eps = 0.1, delta = 0.12.';

mEC{3} = [ 3 ];

mEC\_label{3} = 'mEC 3: 5-star with 2-cliques (core motif), Group I-A (graph 3)';

mEC\_core\_motifs{3} = '{ [1 2 3 4 5] }';

mEC{4} = [ 4 ];

mEC\_label{4} = 'mEC 4: 4-cycle[1,3][2,4] (core motif), Group I-B (graph 4)';

mEC\_core\_motifs{4} = '{ [1 2 3 4 5] }';

mEC{5} = [ 5 ];

mEC\_label{5} = 'mEC 5: 4-cycle[1,3][2,4] plus edge out (core motif), Group I-B (graph 5)';

mEC\_core\_motifs{5} = '{ [1 2 3 4 5] }';

mEC{6} = [ 6 ];

mEC\_label{6} = 'mEC 6: 4-cycle[1,3][2,4] plus 2 edges out (core motif), Group I-B (graph 6)';

mEC\_core\_motifs{6} = '{ [1 2 3 4 5] }';

mEC{7} = [ 7 ];

mEC\_label{7} = 'mEC 7: clique union 4-cycle + pt (core motif), Group I-C (graph 7)';

mEC\_core\_motifs{7} = '{ [1 2 3 4 5] }';

mEC{8} = [ 8 ];

mEC\_label{8} = 'mEC 8: clique union 4-cycu + pt (core motif), Group I-C (graph 8)';

mEC\_core\_motifs{8} = '{ [1 2 3 4 5] }';

mEC{9} = [ 9 ];

mEC\_label{9} = 'mEC 9: clique union 4-ufd + pt (core motif), Group I-C (graph 9)';

mEC\_core\_motifs{9} = '{ [1 2 3 4 5] }';

mEC\_notes{9} = 'The attractor for this core motif has surprise symmetry.';

mEC{10} = [ 10 ];

mEC\_label{10} = 'mEC 10: clique union 3-cycle + 2-clique (or fusion 3-cycle + pt) (core motif), Group I-C (graph 10)';

mEC\_core\_motifs{10} = '{ [1 2 3 4 5] }';

mEC{11} = [ 11 ];

mEC\_label{11} = 'mEC 11: pure cyclic union on pt, 2-clique, pt, pt (or extended 4-cycu) (core motif), Group I-D (graph 11)';

mEC\_core\_motifs{11} = '{ [1 2 3 4 5] }';

mEC{12} = [ 12 ];

mEC\_label{12} = 'mEC 12: extended 4-cycu down-skip edge node 2 (\*\* no core motifs for eps = 0.51, delta = 1.76 \*\*), Group I-D (graph 12)';

mEC\_core\_motifs{12} = '{ [] }';

mEC\_notes{12} = 'The attractor for this graph (which has \*no\* core motifs) has surprise symmetry. This class contains 1 graph that has parameter dependent core motifs (# 12).';

mEC{13} = [ 13 ];

mEC\_label{13} = 'mEC 13: extended 4-ufd (core motif), Group I-D (graph 13)';

mEC\_core\_motifs{13} = '{ [1 2 3 4 5] }';

mEC\_notes{13} = 'The attractor for this core motif has surprise symmetry.';

mEC{14} = [ 14 ];

mEC\_label{14} = 'mEC 14: extended 4-ufd down-skip edge node 2 (core motif), Group I-D (graph 14)';

mEC\_core\_motifs{14} = '{ [1 2 3 4 5] }';

mEC\_notes{14} = 'The attractor for this core motif has surprise symmetry.';

mEC{15} = [ 15 ];

mEC\_label{15} = 'mEC 15: extended 4-ufd + down-skip edge node 3 (core motif), Group I-D (graph 15)';

mEC\_core\_motifs{15} = '{ [1 2 3 4 5] }';

mEC\_notes{15} = 'The attractor for this core motif has surprise symmetry.';

mEC{16} = [ 16 ];

mEC\_label{16} = 'mEC 16: pure cyclic union pt, 3-clique, pt (core motif), Group I-E (graph 16)';

mEC\_core\_motifs{16} = '{ [1 2 3 4 5] }';

mEC{17} = [ 17 ];

mEC\_label{17} = 'mEC 17: cyclic union pt, 3-clique, pt w/ added back edge (core motif), Group I-E (graph 17)';

mEC\_core\_motifs{17} = '{ [1 2 3 4 5] }';

mEC\_notes{17} = 'The attractor for this core motif has surprise symmetry.';

mEC{18} = [ 18 ];

mEC\_label{18} = 'mEC 18: cyclic union pt, 3-clique, pt w/ two added back edges (core motif), Group I-E (graph 18)';

mEC\_core\_motifs{18} = '{ [1 2 3 4 5] }';

mEC\_notes{18} = 'The attractor for this core motif has surprise symmetry.';

mEC{19} = [ 19 ];

mEC\_label{19} = 'mEC 19: pure cyclic union pt, 3-cycle, pt (core motif), Group I-F (graph 19)';

mEC\_core\_motifs{19} = '{ [1 2 3 4 5] }';

mEC\_notes{19} = 'The attractor for this core motif has surprise symmetry.';

mEC{20} = [ 20 ];

mEC\_label{20} = 'mEC 20: cyclic union pt, 3-cycle, pt w/ added back edge (core motif), Group I-F (graph 20)';

mEC\_core\_motifs{20} = '{ [1 2 3 4 5] }';

mEC{21} = [ 21 ];

mEC\_label{21} = 'mEC 21: cyclic union pt, 3-cycle, pt w/ dropped down edge (core motif), Group I-F (graph 21)';

mEC\_core\_motifs{21} = '{ [1 2 3 4 5] }';

mEC{22} = [ 22 ];

mEC\_label{22} = 'mEC 22: cyclic union pt, 3-cycle, pt w/ added back edge and dropped down edge (v1) (core motif), Group I-F (graph 22)';

mEC\_core\_motifs{22} = '{ [1 2 3 4 5] }';

mEC{23} = [ 23 ];

mEC\_label{23} = 'mEC 23: cyclic union pt, 3-cycle, pt w/ added back edge and dropped down edge (v2) (core motif), Group I-F (graph 23)';

mEC\_core\_motifs{23} = '{ [1 2 3 4 5] }';

mEC{24} = [ 24 ];

mEC\_label{24} = 'mEC 24: cyclic union pt, 3-cycle, pt w/ added back edge and dropped down edge (v3) \*\* 2 attractors \*\* (core motif), Group I-F (graph 24)';

mEC\_core\_motifs{24} = '{ [1 2 3 4 5] }';

mEC{25} = [ 25 ];

mEC\_label{25} = 'mEC 25: pure cyclic union pt, 2-clique, 2-clique (core motif), Group I-G (graph 25)';

mEC\_core\_motifs{25} = '{ [1 2 3 4 5] }';

mEC{26} = [ 26 ];

mEC\_label{26} = 'mEC 26: cyclic union pt, 2-clique, 2-clique w/ added back edge (core motif), Group I-G (graph 26)';

mEC\_core\_motifs{26} = '{ [1 2 3 4 5] }';

mEC\_notes{26} = 'The attractor for this core motif has surprise symmetry.';

mEC{27} = [ 27 ];

mEC\_label{27} = 'mEC 27: cyclic union pt, 2-clique, 2-clique w/ two added back edges (v1) (core motif), Group I-G (graph 27)';

mEC\_core\_motifs{27} = '{ [1 2 3 4 5] }';

mEC\_notes{27} = 'The attractor for this core motif has surprise symmetry.';

mEC{28} = [ 28 ];

mEC\_label{28} = 'mEC 28: cyclic union pt, 2-clique, 2-clique w/ two added back edges (v2) (core motif), Group I-G (graph 28)';

mEC\_core\_motifs{28} = '{ [1 2 3 4 5] }';

mEC\_notes{28} = 'The attractor for this core motif has surprise symmetry. This graph is s\_i-equivalent to graph 27.';

mEC{29} = [ 29 ];

mEC\_label{29} = 'mEC 29: cyclic union pt, 2-clique, 2-clique w/ three added back edges (v1) (core motif), Group I-G (graph 29)';

mEC\_core\_motifs{29} = '{ [1 2 3 4 5] }';

mEC\_notes{29} = 'The attractor for this core motif has surprise symmetry.';

mEC{30} = [ 30 ];

mEC\_label{30} = 'mEC 30: cyclic union pt, 2-clique, 2-clique w/ three added back edges (v2) (core motif), Group I-G (graph 30)';

mEC\_core\_motifs{30} = '{ [1 2 3 4 5] }';

mEC\_notes{30} = 'The attractor for this core motif has surprise symmetry. This graph is s\_i-equivalent to graph 29.';

mEC{31} = [ 31 ];

mEC\_label{31} = 'mEC 31: cyclic union pt, 2-clique, 2-clique w/ two added back edges (v3) (core motif), Group I-G (graph 31)';

mEC\_core\_motifs{31} = '{ [1 2 3 4 5] }';

mEC\_notes{31} = 'The attractor for this core motif has surprise symmetry.';

mEC{32} = [ 32 ];

mEC\_label{32} = 'mEC 32: envelope attractor (v1) (\*\* no core motifs for eps = 0.51, delta = 1.76 \*\*), Group I-H (graph 32)';

mEC\_core\_motifs{32} = '{ [] }';

mEC\_notes{32} = 'This class contains 1 graph that has parameter dependent core motifs (# 32).';

mEC{33} = [ 33 ];

mEC\_label{33} = 'mEC 33: envelope attractor (v2) (\*\* no core motifs for eps = 0.51, delta = 1.76 \*\*), Group I-H (graph 33)';

mEC\_core\_motifs{33} = '{ [] }';

mEC\_notes{33} = 'This class contains 1 graph that has parameter dependent core motifs (# 33).';

mEC{34} = [ 34 ];

mEC\_label{34} = 'mEC 34: envelope attractor (v3) (core motif), Group I-H (graph 34)';

mEC\_core\_motifs{34} = '{ [1 2 3 4 5] }';

mEC{35} = [ 35 ];

mEC\_label{35} = 'mEC 35: envelope attractor (v4) (core motif), Group I-H (graph 35)';

mEC\_core\_motifs{35} = '{ [1 2 3 4 5] }';

mEC{36} = [ 36 ];

mEC\_label{36} = 'mEC 36: envelope attractor (v5) (core motif), Group I-H (graph 36)';

mEC\_core\_motifs{36} = '{ [1 2 3 4 5] }';

mEC{37} = [ 37 ];

mEC\_label{37} = 'mEC 37: double envelope attractor (v1) (core motif), Group I-I (graph 37)';

mEC\_core\_motifs{37} = '{ [1 2 3 4 5] }';

mEC{38} = [ 38 ];

mEC\_label{38} = 'mEC 38: double envelope attractor (v2) (core motif), Group I-I (graph 38)';

mEC\_core\_motifs{38} = '{ [1 2 3 4 5] }';

mEC{39} = [ 39 ];

mEC\_label{39} = 'mEC 39: weird attractor (core motif), Group I-J (graph 39)';

mEC\_core\_motifs{39} = '{ [1 2 3 4 5] }';

mEC{40} = [ 40:52 ];

mEC\_label{40} = 'mEC 40: 4-cycle [13 graphs] Group II (graphs [40:52])';

mEC\_core\_motifs{40} = '{ [1 2 3 4] }';

mEC{41} = [ 53:54 ];

mEC\_label{41} = 'mEC 41: 4-cycle + sink [2 graphs] Group II (graphs [53:54])';

mEC\_core\_motifs{41} = '{ [1 2 3 4], [5] }';

mEC{42} = [ 55:58 ];

mEC\_label{42} = 'mEC 42: 4-cycle + 2-clique [4 graphs] Group II (graphs [55:58])';

mEC\_core\_motifs{42} = '{ [1 2 3 4], [4 5] }';

mEC{43} = [ 59:60 ];

mEC\_label{43} = 'mEC 43: 4-cycle + 3-cycle [2 graphs] Group II (graphs [59:60])';

mEC\_core\_motifs{43} = '{ [1 2 3 4], [3 4 5] }';

mEC{44} = [ 61 ];

mEC\_label{44} = 'mEC 44: two 4-cycles [1 graph] Group II (graph 61)';

mEC\_core\_motifs{44} = '{ [1 2 3 4], [2 3 4 5] }';

mEC{45} = [ 62:118 ];

mEC\_label{45} = 'mEC 45: 4-cycu [57 graphs] Group II (graphs [62:118])';

mEC\_core\_motifs{45} = '{ [1 2 3 4] }';

mEC\_notes{45} = 'This class contains 5 graph(s) that have parameter dependent core motifs (# 86 93 97 113 117).';

mEC{46} = [ 119:125 ];

mEC\_label{46} = 'mEC 46: 4-cycu + sink [7 graphs] Group II (graphs [119:125])';

mEC\_core\_motifs{46} = '{ [1 2 3 4], [5] }';

mEC\_notes{46} = 'This class contains 1 graph(s) that are missing an attractor (# 124). This class contains 1 graph that has parameter dependent core motifs (# 124).';

mEC{47} = [ 126:129 ];

mEC\_label{47} = 'mEC 47: 4-cycu + 2-clique (v1) [4 graphs] Group II (graphs [126:129])';

mEC\_core\_motifs{47} = '{ [1 2 3 4], [1 5] }';

mEC{48} = [ 130:137 ];

mEC\_label{48} = 'mEC 48: 4-cycu + 2-clique (v2) [8 graphs] Group II (graphs [130:137])';

mEC\_core\_motifs{48} = '{ [1 2 3 4], [3 5] }';

mEC\_notes{48} = 'This class contains 2 graph(s) that are missing an attractor (# 133 136). This class contains 2 graph(s) that have parameter dependent core motifs (# 133 136).';

mEC{49} = [ 138:144 ];

mEC\_label{49} = 'mEC 49: 4-cycu + 2-clique (v3) [7 graphs] Group II (graphs [138:144])';

mEC\_core\_motifs{49} = '{ [1 2 3 4], [4 5] }';

mEC\_notes{49} = 'This class contains 4 graph(s) that are missing an attractor (# 139 142 143 144). This class contains 4 graph(s) that have parameter dependent core motifs (# 139 142 143 144).';

mEC{50} = [ 145:146 ];

mEC\_label{50} = 'mEC 50: 4-cycu + 3-clique [2 graphs] Group II (graphs [145:146])';

mEC\_core\_motifs{50} = '{ [1 2 3 4], [2 3 5] }';

mEC{51} = [ 147:148 ];

mEC\_label{51} = 'mEC 51: 4-cycu + 3-cycle (v1) [2 graphs] Group II (graphs [147:148])';

mEC\_core\_motifs{51} = '{ [1 2 3 4], [3 4 5] }';

mEC\_notes{51} = 'This class contains 1 graph(s) that are missing an attractor (# 148). This class contains 1 graph that has parameter dependent core motifs (# 148).';

mEC{52} = [ 149:150 ];

mEC\_label{52} = 'mEC 52: 4-cycu + 3-cycle (v2) [2 graphs] Group II (graphs [149:150])';

mEC\_core\_motifs{52} = '{ [1 2 3 4], [1 4 5] }';

mEC{53} = [ 151 ];

mEC\_label{53} = 'mEC 53: two 4-cycus (v1) [1 graph] Group II (graph 151)';

mEC\_core\_motifs{53} = '{ [1 2 3 4], [2 3 4 5] }';

mEC{54} = [ 152 ];

mEC\_label{54} = 'mEC 54: two 4-cycus (v2) [1 graph] Group II (graph 152)';

mEC\_core\_motifs{54} = '{ [1 2 3 4], [1 3 4 5] }';

mEC{55} = [ 153 ];

mEC\_label{55} = 'mEC 55: two 4-cycus (v3) [1 graph] Group II (graph 153)';

mEC\_core\_motifs{55} = '{ [1 2 3 4], [1 2 3 5] }';

mEC{56} = [ 154:260 ];

mEC\_label{56} = 'mEC 56: 4-ufd [107 graphs] Group II (graphs [154:260])';

mEC\_core\_motifs{56} = '{ [1 2 3 4] }';

mEC{57} = [ 261:271 ];

mEC\_label{57} = 'mEC 57: 4-ufd + sink [11 graphs] Group II (graphs [261:271])';

mEC\_core\_motifs{57} = '{ [1 2 3 4], [5] }';

mEC\_notes{57} = 'This class contains 1 graph(s) that are missing an attractor (# 267).';

mEC{58} = [ 272:279 ];

mEC\_label{58} = 'mEC 58: 4-ufd + 2-clique (v1) [8 graphs] Group II (graphs [272:279])';

mEC\_core\_motifs{58} = '{ [1 2 3 4], [1 5] }';

mEC\_notes{58} = 'This class contains 2 graph(s) that are missing an attractor (# 276 279).';

mEC{59} = [ 280:283 ];

mEC\_label{59} = 'mEC 59: 4-ufd + 2-clique (v2) [4 graphs] Group II (graphs [280:283])';

mEC\_core\_motifs{59} = '{ [1 2 3 4], [2 5] }';

mEC{60} = [ 284:291 ];

mEC\_label{60} = 'mEC 60: 4-ufd + 2-clique (v3) [8 graphs] Group II (graphs [284:291])';

mEC\_core\_motifs{60} = '{ [1 2 3 4], [3 5] }';

mEC{61} = [ 292:307 ];

mEC\_label{61} = 'mEC 61: 4-ufd + 2-clique (v4) [16 graphs] Group II (graphs [292:307])';

mEC\_core\_motifs{61} = '{ [1 2 3 4], [4 5] }';

mEC\_notes{61} = 'This class contains 3 graph(s) that are missing an attractor (# 293 299 305).';

mEC{62} = [ 308:309 ];

mEC\_label{62} = 'mEC 62: 4-ufd + 3-clique (v1) [2 graphs] Group II (graphs [308:309])';

mEC\_core\_motifs{62} = '{ [1 2 3 4], [1 2 5] }';

mEC{63} = [ 310:311 ];

mEC\_label{63} = 'mEC 63: 4-ufd + 3-clique (v2) [2 graphs] Group II (graphs [310:311])';

mEC\_core\_motifs{63} = '{ [1 2 3 4], [2 3 5] }';

mEC{64} = [ 312:314 ];

mEC\_label{64} = 'mEC 64: 4-ufd + 3-cycle (v1) [3 graphs] Group II (graphs [312:314])';

mEC\_core\_motifs{64} = '{ [1 2 3 4], [3 4 5] }';

mEC\_notes{64} = 'This class contains 1 graph(s) that are missing an attractor (# 314).';

mEC{65} = [ 315:317 ];

mEC\_label{65} = 'mEC 65: 4-ufd + 3-cycle (v2) [3 graphs] Group II (graphs [315:317])';

mEC\_core\_motifs{65} = '{ [1 2 3 4], [1 4 5] }';

mEC{66} = [ 318 ];

mEC\_label{66} = 'mEC 66: 4-ufd + fusion 3-cycle [1 graph] Group II (graph 318)';

mEC\_core\_motifs{66} = '{ [1 2 3 4], [1 2 3 5] }';

mEC{67} = [ 319:320 ];

mEC\_label{67} = 'mEC 67: 4-ufd + 4-cycu (v1) [2 graphs] Group II (graphs [319:320])';

mEC\_core\_motifs{67} = '{ [1 2 3 4], [2 3 4 5] }';

mEC\_notes{67} = 'This class contains 2 graph(s) that are missing an attractor (# 319 320). This class contains 2 graph(s) that have parameter dependent core motifs (# 319 320).';

mEC{68} = [ 321 ];

mEC\_label{68} = 'mEC 68: 4-ufd + 4-cycu (v2) [1 graph] Group II (graph 321)';

mEC\_core\_motifs{68} = '{ [1 2 3 4], [1 3 4 5] }';

mEC{69} = [ 322 ];

mEC\_label{69} = 'mEC 69: 4-ufd + 4-cycu (v3) [1 graph] Group II (graph 322)';

mEC\_core\_motifs{69} = '{ [1 2 3 4], [1 3 4 5] }';

mEC\_notes{69} = 'This class contains 1 graph(s) that are missing an attractor (# 322). This class contains 1 graph that has parameter dependent core motifs (# 322).';

mEC{70} = [ 323 ];

mEC\_label{70} = 'mEC 70: two 4-ufds (v1) [1 graph] Group II (graph 323)';

mEC\_core\_motifs{70} = '{ [1 2 3 4], [2 3 4 5] }';

mEC{71} = [ 324 ];

mEC\_label{71} = 'mEC 71: two 4-ufds (v2) [1 graph] Group II (graph 324)';

mEC\_core\_motifs{71} = '{ [1 2 3 4], [2 3 4 5] }';

mEC{72} = [ 325 ];

mEC\_label{72} = 'mEC 72: two 4-ufds (v3) [1 graph] Group II (graph 325)';

mEC\_core\_motifs{72} = '{ [1 2 3 4], [1 3 4 5] }';

mEC{73} = [ 326 ];

mEC\_label{73} = 'mEC 73: two 4-ufds (v4) [1 graph] Group II (graph 326)';

mEC\_core\_motifs{73} = '{ [1 2 3 4], [1 2 4 5] }';

mEC{74} = [ 327 ];

mEC\_label{74} = 'mEC 74: two 4-ufds (v5) [1 graph] Group II (graph 327)';

mEC\_core\_motifs{74} = '{ [1 2 3 4], [1 2 3 5] }';

mEC{75} = [ 328 ];

mEC\_label{75} = 'mEC 75: two 4-ufds (v6) [1 graph] Group II (graph 328)';

mEC\_core\_motifs{75} = '{ [1 2 3 4], [1 3 4 5] }';

mEC\_notes{75} = 'This class contains 1 graph(s) that are missing an attractor (# 328).';

mEC{76} = [ 329:598 ];

mEC\_label{76} = 'mEC 76: 3-cycle [270 graphs] Group III (graphs [329:598])';

mEC\_core\_motifs{76} = '{ [1 2 3] }';

mEC{77} = [ 599:660 ];

mEC\_label{77} = 'mEC 77: 3-cycle + sink [62 graphs] Group III (graphs [599:660])';

mEC\_core\_motifs{77} = '{ [1 2 3], [4] }';

mEC{78} = [ 661:664 ];

mEC\_label{78} = 'mEC 78: 3-cycle + two sinks [4 graphs] Group III (graphs [661:664])';

mEC\_core\_motifs{78} = '{ [1 2 3], [4], [5] }';

mEC{79} = [ 665:716 ];

mEC\_label{79} = 'mEC 79: 3-cycle + 2-clique (disjoint) [52 graphs] Group III (graphs [665:716])';

mEC\_core\_motifs{79} = '{ [1 2 3], [4 5] }';

mEC{80} = [ 717:864 ];

mEC\_label{80} = 'mEC 80: 3-cycle + 2-clique (overlap) [148 graphs] Group III (graphs [717:864])';

mEC\_core\_motifs{80} = '{ [1 2 3], [3 4] }';

mEC{81} = [ 865:878 ];

mEC\_label{81} = 'mEC 81: 3-cycle + 2-clique + sink [14 graphs] Group III (graphs [865:878])';

mEC\_core\_motifs{81} = '{ [1 2 3], [3 4], [5] }';

mEC{82} = [ 879:881 ];

mEC\_label{82} = 'mEC 82: 3-cycle + two 2-cliques (v1) [3 graphs] Group III (graphs [879:881])';

mEC\_core\_motifs{82} = '{ [1 2 3], [3 4], [3 5] }';

mEC{83} = [ 882:895 ];

mEC\_label{83} = 'mEC 83: 3-cycle + two 2-cliques (v2) [14 graphs] Group III (graphs [882:895])';

mEC\_core\_motifs{83} = '{ [1 2 3], [1 5], [3 4] }';

mEC{84} = [ 896:907 ];

mEC\_label{84} = 'mEC 84: 3-cycle + two 2-cliques (v3) [12 graphs] Group III (graphs [896:907])';

mEC\_core\_motifs{84} = '{ [1 2 3], [3 4], [4 5] }';

mEC{85} = [ 908:909 ];

mEC\_label{85} = 'mEC 85: 3-cycle + three 2-cliques [2 graphs] Group III (graphs [908:909])';

mEC\_core\_motifs{85} = '{ [1 2 3], [1 5], [3 4], [4 5] }';

mEC{86} = [ 910:916 ];

mEC\_label{86} = 'mEC 86: 3-cycle + 3-clique [7 graphs] Group III (graphs [910:916])';

mEC\_core\_motifs{86} = '{ [1 2 3], [3 4 5] }';

mEC{87} = [ 917:920 ];

mEC\_label{87} = 'mEC 87: two 3-cycles (v1) [4 graphs] Group III (graphs [917:920])';

mEC\_core\_motifs{87} = '{ [1 2 3], [3 4 5] }';

mEC{88} = [ 921:961 ];

mEC\_label{88} = 'mEC 88: two 3-cycles (v2, "butterfly") [41 graphs] Group III (graphs [921:961])';

mEC\_core\_motifs{88} = '{ [1 2 3], [2 3 4] }';

mEC{89} = [ 962:966 ];

mEC\_label{89} = 'mEC 89: two 3-cycles + sink [5 graphs] Group III (graphs [962:966])';

mEC\_core\_motifs{89} = '{ [1 2 3], [2 3 4], [5] }';

mEC{90} = [ 967:972 ];

mEC\_label{90} = 'mEC 90: two 3-cycles + 2-clique (v1) [6 graphs] Group III (graphs [967:972])';

mEC\_core\_motifs{90} = '{ [1 2 3], [2 3 4], [4 5] }';

mEC{91} = [ 973:975 ];

mEC\_label{91} = 'mEC 91: two 3-cycles + 2-clique (v2) [3 graphs] Group III (graphs [973:975])';

mEC\_core\_motifs{91} = '{ [1 2 3], [2 3 4], [2 5] }';

mEC{92} = [ 976:977 ];

mEC\_label{92} = 'mEC 92: two 3-cycles + 2-clique (v3) [2 graphs] Group III (graphs [976:977])';

mEC\_core\_motifs{92} = '{ [1 2 3], [2 3 4], [3 5] }';

mEC{93} = [ 978:979 ];

mEC\_label{93} = 'mEC 93: two 3-cycles + two 2-cliques [2 graphs] Group III (graphs [978:979])';

mEC\_core\_motifs{93} = '{ [1 2 3], [1 5], [2 3 4], [4 5] }';

mEC{94} = [ 980 ];

mEC\_label{94} = 'mEC 94: three 3-cycles (v1) [1 graph] Group III (graph 980)';

mEC\_core\_motifs{94} = '{ [1 2 3], [2 3 4], [2 3 5] }';

mEC\_notes{94} = 'The attractors are quasiperiodic for eps = 0.25, delta = 0.5.';

mEC{95} = [ 981 ];

mEC\_label{95} = 'mEC 95: three 3-cycles (v2) [1 graph] Group III (graph 981)';

mEC\_core\_motifs{95} = '{ [1 2 3], [2 3 4], [3 4 5] }';

mEC{96} = [ 982 ];

mEC\_label{96} = 'mEC 96: four 3-cycles [1 graph] Group III (graph 982)';

mEC\_core\_motifs{96} = '{ [1 2 3], [1 3 5], [2 3 4], [3 4 5] }';

mEC\_notes{96} = 'This is baby chaos for eps = 0.25, delta = 0.5.';

mEC{97} = [ 983:1031 ];

mEC\_label{97} = 'mEC 97: fusion 3-cycle [49 graphs] Group III (graphs [983:1031])';

mEC\_core\_motifs{97} = '{ [1 2 3 4] }';

mEC{98} = [ 1032:1037 ];

mEC\_label{98} = 'mEC 98: fusion 3-cycle + sink [6 graphs] Group III (graphs [1032:1037])';

mEC\_core\_motifs{98} = '{ [1 2 3 4], [5] }';

mEC{99} = [ 1038:1047 ];

mEC\_label{99} = 'mEC 99: fusion 3-cycle + 2-clique (v1) [10 graphs] Group III (graphs [1038:1047])';

mEC\_core\_motifs{99} = '{ [1 2 3 4], [1 5] }';

mEC{100} = [ 1048:1049 ];

mEC\_label{100} = 'mEC 100: fusion 3-cycle + 2-clique (v2) [2 graphs] Group III (graphs [1048:1049])';

mEC\_core\_motifs{100} = '{ [1 2 3 4], [4 5] }';

mEC{101} = [ 1050:1051 ];

mEC\_label{101} = 'mEC 101: fusion 3-cycle + 3-clique [2 graphs] Group III (graphs [1050:1051])';

mEC\_core\_motifs{101} = '{ [1 2 3 4], [3 4 5] }';

mEC{102} = [ 1052 ];

mEC\_label{102} = 'mEC 102: two fusion 3-cycles (v1) [1 graph] Group III (graph 1052)';

mEC\_core\_motifs{102} = '{ [1 2 3 4], [1 2 3 5] }';

mEC{103} = [ 1053 ];

mEC\_label{103} = 'mEC 103: two fusion 3-cycles (v2) [1 graph] Group III (graph 1053)';

mEC\_core\_motifs{103} = '{ [1 2 3 4], [1 2 4 5] }';

mEC{104} = [ 1054 ];

mEC\_label{104} = 'mEC 104: 5-clique [1 graph] Group IV (graph 1054)';

mEC\_core\_motifs{104} = '{ [1 2 3 4 5] }';

mEC{105} = [ 1055:1074 ];

mEC\_label{105} = 'mEC 105: 4-clique [20 graphs] Group IV (graphs [1055:1074])';

mEC\_core\_motifs{105} = '{ [1 2 3 4] }';

mEC{106} = [ 1075:1078 ];

mEC\_label{106} = 'mEC 106: 4-clique + sink [4 graphs] Group IV (graphs [1075:1078])';

mEC\_core\_motifs{106} = '{ [1 2 3 4], [5] }';

mEC{107} = [ 1079:1081 ];

mEC\_label{107} = 'mEC 107: 4-clique + 2-clique [3 graphs] Group IV (graphs [1079:1081])';

mEC\_core\_motifs{107} = '{ [1 2 3 4], [4 5] }';

mEC{108} = [ 1082:1083 ];

mEC\_label{108} = 'mEC 108: 4-clique + 3-clique [2 graphs] Group IV (graphs [1082:1083])';

mEC\_core\_motifs{108} = '{ [1 2 3 4], [3 4 5] }';

mEC{109} = [ 1084 ];

mEC\_label{109} = 'mEC 109: two 4-cliques [1 graph] Group IV (graph 1084)';

mEC\_core\_motifs{109} = '{ [1 2 3 4], [2 3 4 5] }';

mEC{110} = [ 1085:1652 ];

mEC\_label{110} = 'mEC 110: 3-clique [568 graphs] Group IV (graphs [1085:1652])';

mEC\_core\_motifs{110} = '{ [1 2 3] }';

mEC{111} = [ 1653:1779 ];

mEC\_label{111} = 'mEC 111: 3-clique + sink [127 graphs] Group IV (graphs [1653:1779])';

mEC\_core\_motifs{111} = '{ [1 2 3], [4] }';

mEC{112} = [ 1780:1788 ];

mEC\_label{112} = 'mEC 112: 3-clique + two sinks [9 graphs] Group IV (graphs [1780:1788])';

mEC\_core\_motifs{112} = '{ [1 2 3], [4], [5] }';

mEC{113} = [ 1789:1894 ];

mEC\_label{113} = 'mEC 113: 3-clique + 2-clique (disjoint) [106 graphs] Group IV (graphs [1789:1894])';

mEC\_core\_motifs{113} = '{ [1 2 3], [4 5] }';

mEC{114} = [ 1895:2096 ];

mEC\_label{114} = 'mEC 114: 3-clique + 2-clique (overlap) [202 graphs] Group IV (graphs [1895:2096])';

mEC\_core\_motifs{114} = '{ [1 2 3], [3 4] }';

mEC{115} = [ 2097:2115 ];

mEC\_label{115} = 'mEC 115: 3-clique + 2-clique + sink [19 graphs] Group IV (graphs [2097:2115])';

mEC\_core\_motifs{115} = '{ [1 2 3], [3 4], [5] }';

mEC{116} = [ 2116:2119 ];

mEC\_label{116} = 'mEC 116: 3-clique + two 2-cliques (v1) [4 graphs] Group IV (graphs [2116:2119])';

mEC\_core\_motifs{116} = '{ [1 2 3], [3 4], [3 5] }';

mEC{117} = [ 2120:2139 ];

mEC\_label{117} = 'mEC 117: 3-clique + two 2-cliques (v2) [20 graphs] Group IV (graphs [2120:2139])';

mEC\_core\_motifs{117} = '{ [1 2 3], [3 4], [4 5] }';

mEC{118} = [ 2140:2151 ];

mEC\_label{118} = 'mEC 118: 3-clique + two 2-cliques (v3) [12 graphs] Group IV (graphs [2140:2151])';

mEC\_core\_motifs{118} = '{ [1 2 3], [1 5], [3 4] }';

mEC{119} = [ 2152:2154 ];

mEC\_label{119} = 'mEC 119: 3-clique + three 2-cliques [3 graphs] Group IV (graphs [2152:2154])';

mEC\_core\_motifs{119} = '{ [1 2 3], [1 5], [3 4], [4 5] }';

mEC{120} = [ 2155:2166 ];

mEC\_label{120} = 'mEC 120: two 3-cliques (v1) [12 graphs] Group IV (graphs [2155:2166])';

mEC\_core\_motifs{120} = '{ [1 2 3], [3 4 5] }';

mEC{121} = [ 2167:2221 ];

mEC\_label{121} = 'mEC 121: two 3-cliques (v2) [55 graphs] Group IV (graphs [2167:2221])';

mEC\_core\_motifs{121} = '{ [1 2 3], [2 3 4] }';

mEC{122} = [ 2222:2228 ];

mEC\_label{122} = 'mEC 122: two 3-clique + sink [7 graphs] Group IV (graphs [2222:2228])';

mEC\_core\_motifs{122} = '{ [1 2 3], [2 3 4], [5] }';

mEC{123} = [ 2229:2232 ];

mEC\_label{123} = 'mEC 123: two 3-cliques + 2-clique (v1) [4 graphs] Group IV (graphs [2229:2232])';

mEC\_core\_motifs{123} = '{ [1 2 3], [2 3 4], [3 5] }';

mEC{124} = [ 2233:2238 ];

mEC\_label{124} = 'mEC 124: two 3-cliques + 2-clique (v2) [6 graphs] Group IV (graphs [2233:2238])';

mEC\_core\_motifs{124} = '{ [1 2 3], [2 3 4], [4 5] }';

mEC{125} = [ 2239:2240 ];

mEC\_label{125} = 'mEC 125: two 3-cliques + two 2-cliques [2 graphs] Group IV (graphs [2239:2240])';

mEC\_core\_motifs{125} = '{ [1 2 3], [1 5], [2 3 4], [4 5] }';

mEC{126} = [ 2241:2242 ];

mEC\_label{126} = 'mEC 126: three 3-cliques (v1) [2 graphs] Group IV (graphs [2241:2242])';

mEC\_core\_motifs{126} = '{ [1 2 3], [2 3 4], [3 4 5] }';

mEC{127} = [ 2243 ];

mEC\_label{127} = 'mEC 127: three 3-cliques (v2) [1 graph] Group IV (graph 2243)';

mEC\_core\_motifs{127} = '{ [1 2 3], [2 3 4], [2 3 5] }';

mEC{128} = [ 2244 ];

mEC\_label{128} = 'mEC 128: four 3-cliques [1 graph] Group IV (graph 2244)';

mEC\_core\_motifs{128} = '{ [1 2 3], [1 3 5], [2 3 4], [3 4 5] }';

mEC{129} = [ 2245:5031 ];

mEC\_label{129} = 'mEC 129: 2-clique [2787 graphs] Group IV (graphs [2245:5031])';

mEC\_core\_motifs{129} = '{ [1 2] }';

mEC{130} = [ 5032:6055 ];

mEC\_label{130} = 'mEC 130: 2-clique + sink [1024 graphs] Group IV (graphs [5032:6055])';

mEC\_core\_motifs{130} = '{ [1 2], [3] }';

mEC{131} = [ 6056:6161 ];

mEC\_label{131} = 'mEC 131: 2-clique + two sinks [106 graphs] Group IV (graphs [6056:6161])';

mEC\_core\_motifs{131} = '{ [1 2], [3], [4] }';

mEC{132} = [ 6162:6167 ];

mEC\_label{132} = 'mEC 132: 2-clique + three sinks [6 graphs] Group IV (graphs [6162:6167])';

mEC\_core\_motifs{132} = '{ [1 2], [3], [4], [5] }';

mEC{133} = [ 6168:7046 ];

mEC\_label{133} = 'mEC 133: two 2-cliques (disjoint) [879 graphs] Group IV (graphs [6168:7046])';

mEC\_core\_motifs{133} = '{ [1 2], [3 4] }';

mEC{134} = [ 7047:7909 ];

mEC\_label{134} = 'mEC 134: two 2-cliques (overlap) [863 graphs] Group IV (graphs [7047:7909])';

mEC\_core\_motifs{134} = '{ [1 2], [2 3] }';

mEC{135} = [ 7910:7994 ];

mEC\_label{135} = 'mEC 135: two 2-cliques (disjoint) + sink [85 graphs] Group IV (graphs [7910:7994])';

mEC\_core\_motifs{135} = '{ [1 2], [3 4], [5] }';

mEC{136} = [ 7995:8175 ];

mEC\_label{136} = 'mEC 136: two 2-cliques (overlap) + sink [181 graphs] Group IV (graphs [7995:8175])';

mEC\_core\_motifs{136} = '{ [1 2], [2 3], [4] }';

mEC{137} = [ 8176:8186 ];

mEC\_label{137} = 'mEC 137: two 2-cliques (overlap) + two sinks [11 graphs] Group IV (graphs [8176:8186])';

mEC\_core\_motifs{137} = '{ [1 2], [2 3], [4], [5] }';

mEC{138} = [ 8187:8338 ];

mEC\_label{138} = 'mEC 138: three 2-cliques (v1) [152 graphs] Group IV (graphs [8187:8338])';

mEC\_core\_motifs{138} = '{ [1 2], [2 3], [4 5] }';

mEC{139} = [ 8339:8484 ];

mEC\_label{139} = 'mEC 139: three 2-cliques (v2) [146 graphs] Group IV (graphs [8339:8484])';

mEC\_core\_motifs{139} = '{ [1 2], [2 3], [3 4] }';

mEC{140} = [ 8485:8516 ];

mEC\_label{140} = 'mEC 140: three 2-cliques (v3) [32 graphs] Group IV (graphs [8485:8516])';

mEC\_core\_motifs{140} = '{ [1 2], [2 3], [2 4] }';

mEC{141} = [ 8517:8530 ];

mEC\_label{141} = 'mEC 141: three 2-cliques + sink (v1) [14 graphs] Group IV (graphs [8517:8530])';

mEC\_core\_motifs{141} = '{ [1 2], [2 3], [3 4], [5] }';

mEC{142} = [ 8531:8535 ];

mEC\_label{142} = 'mEC 142: three 2-cliques + sink (v2) [5 graphs] Group IV (graphs [8531:8535])';

mEC\_core\_motifs{142} = '{ [1 2], [2 3], [2 4], [5] }';

mEC{143} = [ 8536:8551 ];

mEC\_label{143} = 'mEC 143: four 2-cliques (v1) [16 graphs] Group IV (graphs [8536:8551])';

mEC\_core\_motifs{143} = '{ [1 2], [2 3], [3 4], [4 5] }';

mEC{144} = [ 8552:8557 ];

mEC\_label{144} = 'mEC 144: four 2-cliques (v2) [6 graphs] Group IV (graphs [8552:8557])';

mEC\_core\_motifs{144} = '{ [1 2], [2 3], [2 4], [4 5] }';

mEC{145} = [ 8558 ];

mEC\_label{145} = 'mEC 145: four 2-cliques (v3) [1 graph] Group IV (graph 8558)';

mEC\_core\_motifs{145} = '{ [1 2], [2 3], [2 4], [2 5] }';

mEC{146} = [ 8559:8578 ];

mEC\_label{146} = 'mEC 146: four 2-cliques (v4) [20 graphs] Group IV (graphs [8559:8578])';

mEC\_core\_motifs{146} = '{ [1 2], [1 4], [2 3], [3 4] }';

mEC{147} = [ 8579:8581 ];

mEC\_label{147} = 'mEC 147: four 2-cliques + sink [3 graphs] Group IV (graphs [8579:8581])';

mEC\_core\_motifs{147} = '{ [1 2], [1 4], [2 3], [3 4], [5] }';

mEC{148} = [ 8582:8584 ];

mEC\_label{148} = 'mEC 148: five 2-cliques (v1) [3 graphs] Group IV (graphs [8582:8584])';

mEC\_core\_motifs{148} = '{ [1 2], [1 4], [2 3], [3 4], [4 5] }';

mEC{149} = [ 8585 ];

mEC\_label{149} = 'mEC 149: five 2-cliques (v2) [1 graph] Group IV (graph 8585)';

mEC\_core\_motifs{149} = '{ [1 2], [1 5], [2 3], [3 4], [4 5] }';

mEC{150} = [ 8586 ];

mEC\_label{150} = 'mEC 150: six 2-cliques [1 graph] Group IV (graph 8586)';

mEC\_core\_motifs{150} = '{ [1 2], [1 4], [2 3], [2 5], [3 4], [4 5] }';

mEC{151} = [ 8587:9350 ];

mEC\_label{151} = 'mEC 151: sink [764 graphs] Group IV (graphs [8587:9350])';

mEC\_core\_motifs{151} = '{ [1] }';

mEC{152} = [ 9351:9571 ];

mEC\_label{152} = 'mEC 152: two sinks [221 graphs] Group IV (graphs [9351:9571])';

mEC\_core\_motifs{152} = '{ [1], [2] }';

mEC{153} = [ 9572:9603 ];

mEC\_label{153} = 'mEC 153: three sinks [32 graphs] Group IV (graphs [9572:9603])';

mEC\_core\_motifs{153} = '{ [1], [2], [3] }';

mEC{154} = [ 9604:9607 ];

mEC\_label{154} = 'mEC 154: four sinks [4 graphs] Group IV (graphs [9604:9607])';

mEC\_core\_motifs{154} = '{ [1], [2], [3], [4] }';

mEC{155} = [ 9608 ];

mEC\_label{155} = 'mEC 155: five sinks [1 graph] Group IV (graph 9608)';

mEC\_core\_motifs{155} = '{ [1], [2], [3], [4], [5] }';

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% mEC\_start gives a list of the first graph in each mEC class

mEC\_start = [ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, ...

16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, ...

31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 53, 55, 59, 61, 62, ...

119, 126, 130, 138, 145, 147, 149, 151, 152, 153, 154, 261, 272, 280, 284, ...

292, 308, 310, 312, 315, 318, 319, 321, 322, 323, 324, 325, 326, 327, 328, ...

329, 599, 661, 665, 717, 865, 879, 882, 896, 908, 910, 917, 921, 962, 967, ...

973, 976, 978, 980, 981, 982, 983, 1032, 1038, 1048, 1050, 1052, 1053, 1054, 1055, ...

1075, 1079, 1082, 1084, 1085, 1653, 1780, 1789, 1895, 2097, 2116, 2120, 2140, 2152, 2155, ...

2167, 2222, 2229, 2233, 2239, 2241, 2243, 2244, 2245, 5032, 6056, 6162, 6168, 7047, 7910, ...

7995, 8176, 8187, 8339, 8485, 8517, 8531, 8536, 8552, 8558, 8559, 8579, 8582, 8585, 8586, ...

8587, 9351, 9572, 9604, 9608 ];

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% mEC\_end gives a list of the last graph in each mEC class

mEC\_end = [ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, ...

16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, ...

31, 32, 33, 34, 35, 36, 37, 38, 39, 52, 54, 58, 60, 61, 118, ...

125, 129, 137, 144, 146, 148, 150, 151, 152, 153, 260, 271, 279, 283, 291, ...

307, 309, 311, 314, 317, 318, 320, 321, 322, 323, 324, 325, 326, 327, 328, ...

598, 660, 664, 716, 864, 878, 881, 895, 907, 909, 916, 920, 961, 966, 972, ...

975, 977, 979, 980, 981, 982, 1031, 1037, 1047, 1049, 1051, 1052, 1053, 1054, 1074, ...

1078, 1081, 1083, 1084, 1652, 1779, 1788, 1894, 2096, 2115, 2119, 2139, 2151, 2154, 2166, ...

2221, 2228, 2232, 2238, 2240, 2242, 2243, 2244, 5031, 6055, 6161, 6167, 7046, 7909, 7994, ...

8175, 8186, 8338, 8484, 8516, 8530, 8535, 8551, 8557, 8558, 8578, 8581, 8584, 8585, 8586, ...

9350, 9571, 9603, 9607, 9608 ];

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% mECs containing at least one graph that has a core motif with \*no\* corresponding attractor:

% (there are 14 such mECs)

mECs\_missing\_att = [ 46, 48, 49, 51, 57, 58, 61, 64, 66, 67, 68, 69, 74, 75 ];

% Graphs that have a core motif with \*no\* corresponding attractor:

% (there are 19 such graphs)

graphs\_missing\_att = [ 124, 133, 136, 139, 142, 143, 144, 148, 267, 276, ...

279, 293, 299, 305, 314, 319, 320, 322, 328 ];

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% mECs containing at least one graph with parameter dependent core motifs:

% (there are 10 such mECs)

mECs\_param\_dep = [ 12, 32, 33, 45, 46, 48, 49, 51, 67, 69 ];

% Graphs that have parameter dependent core motifs:

% (there are 19 such graphs)

graphs\_param\_dep = [ 12, 32, 33, 86, 93, 97, 113, 117, 124, 133, 136, 139, 142, 143, 144, ...

148, 319, 320, 322 ];

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save('n5\_mECs.mat', 'mEC', 'mEC\_label','mEC\_notes', 'mEC\_core\_motifs', 'mEC\_start', 'mEC\_end', 'mECs\_missing\_att', 'graphs\_missing\_att', 'mECs\_param\_dep', 'graphs\_param\_dep')