SNA ASSIGNMENT REPORT
17BCS028
SOMYADEEP SHRIVASTAVA
SEIR MODEL

ALGORITHM FOR SEIR MODEL

STEP 1 : INITIALLY ASSUME FEW NODES AS INFECTIOUS REST SUSCEPTIBLE

STEP 2 : CALL THE INFECT FUNCTION BY PASSING TIMESTAMPS , PROBABILITY ,NO OF ITERATIONS

***(INSIDE INFECT FUNCTION*)**

STEP 3:

ITERATE THROUGH THE INFECTIOUS NODES NEIGHBOUR
USING CONCEPT OF TOSSING A COIN SEE IF R < P
CONVERT "ONLY" A "SUSCEPTIBLE " NODE TO EXPOSED.

STEP 4 : AFTER ITERATING ALL OF THE CURRENT INFECTIOUS NODE, DECREASE TIMESTAMP FOR EACH STATE AND CONVERT THE STATE THOSE WHO CROSS THE TIMESTAMP THRESHOLD

STEP5 : REPEAT STEP 3 UNTIL TOTAL NUMBER OF ITERATIONS COVERED

ALGORITHM FOR DETERMINING PSUEDO-CORE

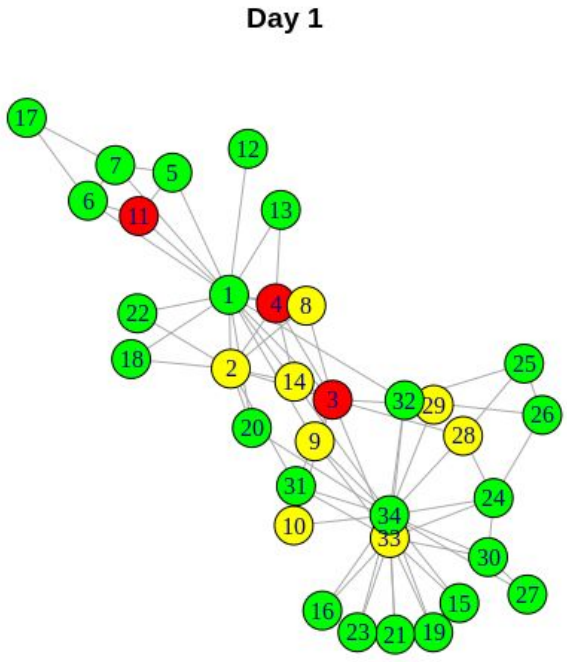
STEP 1 : APPLY K-SHELL DECOMPSOITION ON GIVEN NETWORK

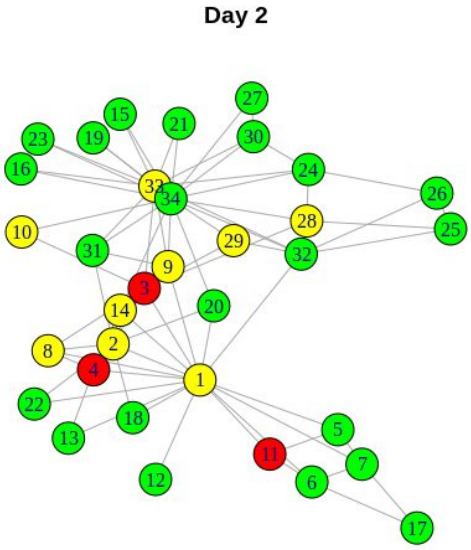
STEP 2 : FROM EACH SHELL SEND EVERY NODE TO *SEIR MODEL* TO FIND HOW MANY IT INFECTED AT LAST AND SAVE AVERAGE CASCADING POWER OF EACH SHELL

STEP 3 : COMPARE CASCADING POWER TO CORE NODE AND FIND PSEUDOCORES BY ANALYZING PLOT

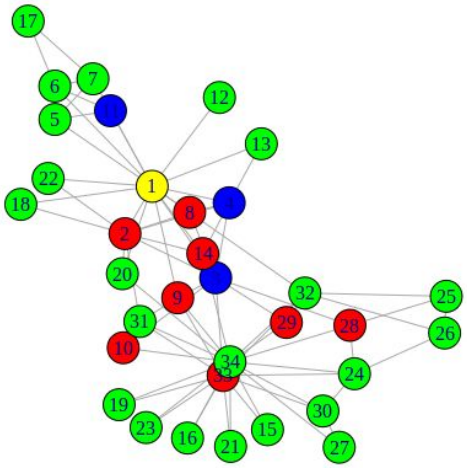
CONTENT

PLOT for probability = 0.3 and t_i = t_r = t_e = 1 , iterations 5 on KARATE
Initial Infectious Nodes (3,4,11)





Day 3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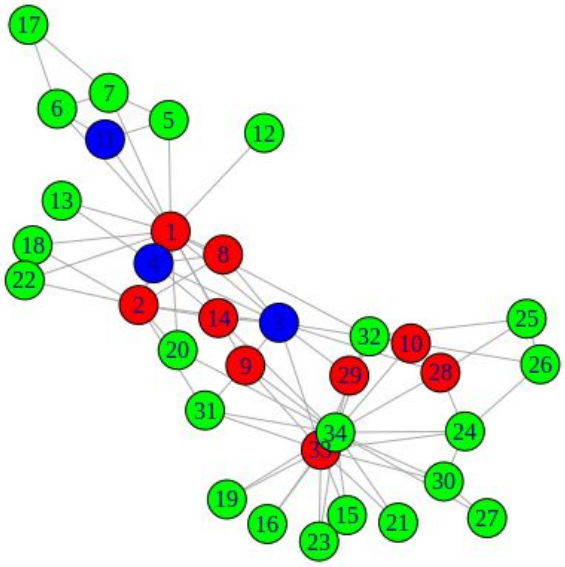
Day 4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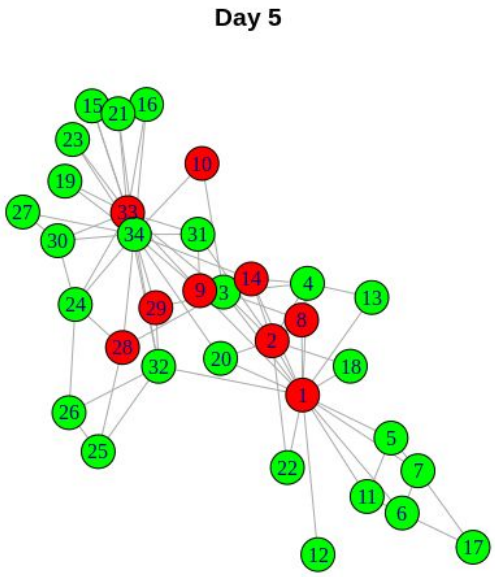


KARATE (initial infectious node = 3,11 and number of iterations = 8)

P	t_i	t_e	t_r	S	E	I	R
0.3	1	3	2	24	1	3	6
0.4	2	1	1	30	0	0	4
0.5	3	2	3	24	0	1	9

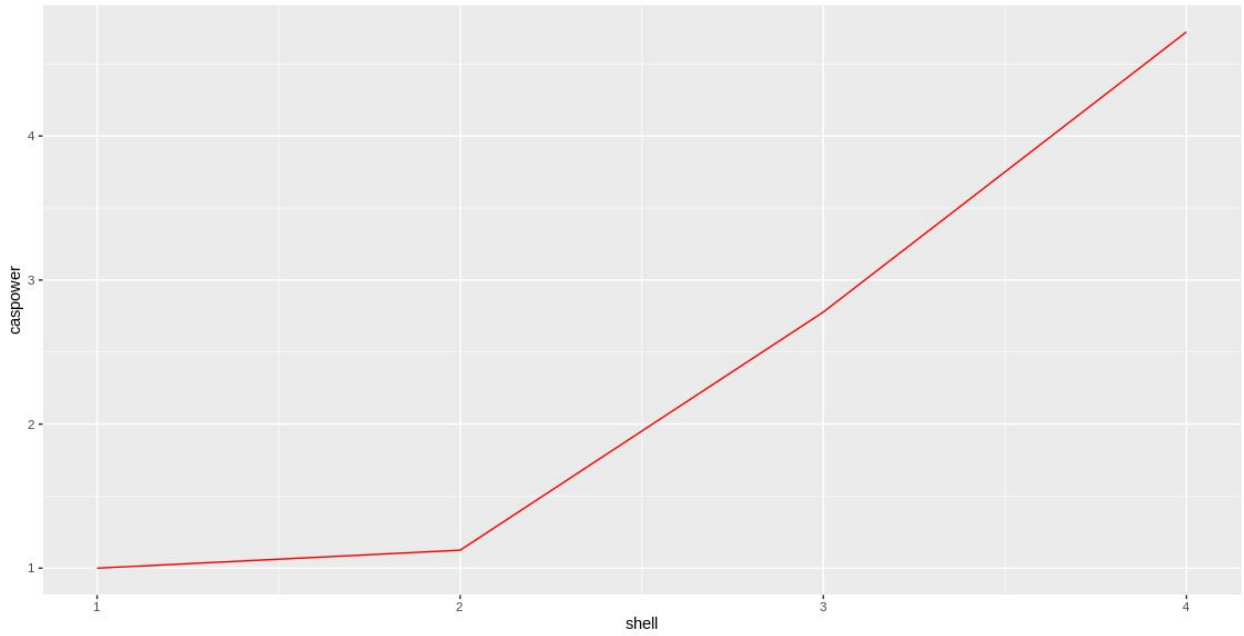
DOLPHIN (initial infectious node = 3,11 and number of iterations = 8)

P	t_i	t_e	t_r	S	E	I	R
0.3	1	3	2	59	0	2	1
0.4	2	1	1	60	0	1	1
0.5	3	2	3	59	1	0	2

PSUEDO CORE IN DOLPHIN

3 shell

	shell	caspower
1	1	1.000000
2	2	1.125000
3	3	2.777778
4	4	4.722222



PSUEDO CORE IN karate

3 shell

	shell	caspower
1	1	1.000000
2	2	1.454545
3	3	2.750000
4	4	5.600000