1106 DIS 208 Week 2 (#2) 1/31/2020

Discussion Outline

- Upcoming Assessment
- Disease Models
- Worksheets

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office hours: 3-5 Thu.

Shriya's office hours
Cancelled today
~~1-3pm~~ New time: Sunday 3-5 pm (2/2).

Upcoming Assessment

- Homework 2 (Monday, 2/3)
- Reading Quiz 5 (Monday, 2/3)
- Prelim 1 (6 weeks away, 10/3)
- Quiz 1 (Friday, 2/7).

- You can always ask questions on Piazza

- Other resources: Stack Exchange.

Last time: Population model with crowding ($X' = bX - cX^2$)

Today: Disease Transmission models.

Model 1

Round	(S)us. (1)	(I)nfected (0)	
0	9	9	($\Sigma = 18$)
1	9	9	
2	2	16	
3	0	18	
4	⋮	⋮	
5			
6			
7			

P1 Round	Stick
0	0
1	0
2	
3	
⋮	

P2 Round	Stick
0	1
1	0
2	
3	
⋮	

Model 2

$\Sigma = 18$

Round	(1) (S)usc.	(1) (I)nfected	(0) R
~~0~~	12	6	0
~~1~~	6	12	0
~~2~~	6	2	10
~~3~~	5	0	13
4	5	0	13
5	5	0	13
6	⋮	⋮	⋮
7			

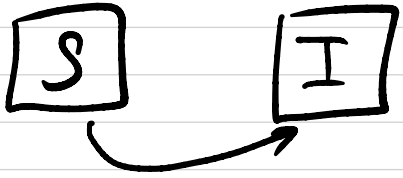
Model 3 $\varepsilon = 18$

Round	(1) (Susc.	(0) (Infected	(R)	(V)
0	8	2	0	8
1	8	2	0	8
2	7	1	2	8
3	7	1	2	8
4	7	0	3	8
5	⋮	⋮	⋮	⋮
6				
7				

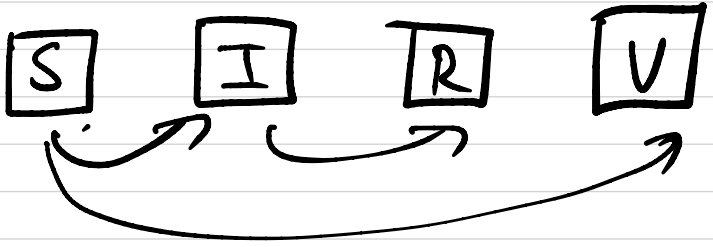
Model 4 (1) $\Sigma = 18$ (0)

Round	(S)usc.	(I)nfected	R	✓
~~0~~	1	1	0	16
~~1~~	1	1	0	16
~~2~~	1	0	1	16
3	1	0	1	16
4	⋮	⋮	⋮	⋮
5	⋮			
6				
7				

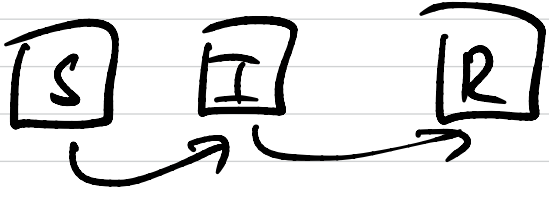
Model 1



Model 3 / Model 4



Model 2



Q2 (a) (x, v) (position, velocity).

- $[0, \infty) \times (-\infty, \infty)$

— $\mathbb{R} \times \mathbb{R}$ is fine too.

(b) $x' = v$

(c) $v' = a$ $\quad F = ma$

$F/m = a$

$v' = F/m$

(d) $F = -kx$

$$v' = F/m = \frac{-kx}{m} = -\frac{k}{m}x$$

$$x' = v$$