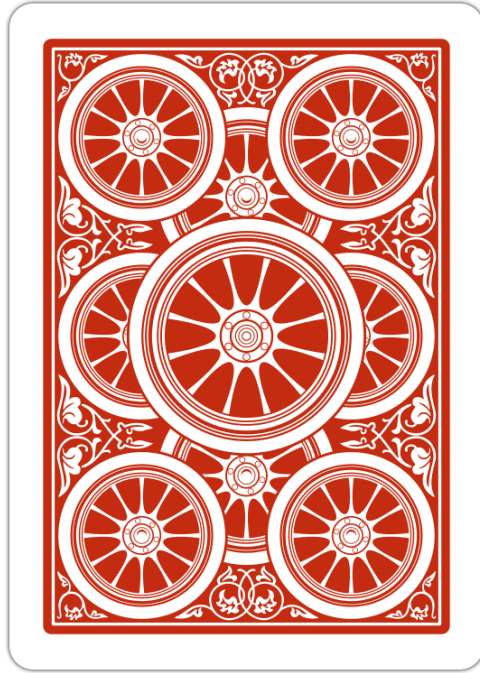
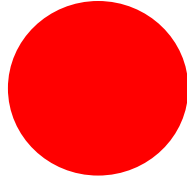


How To Play

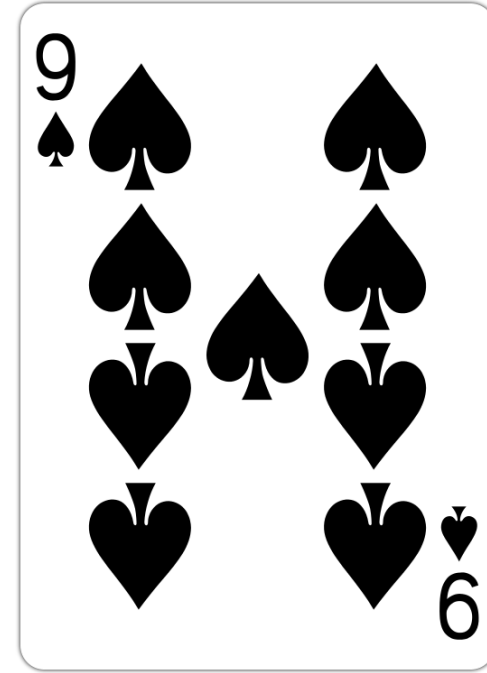
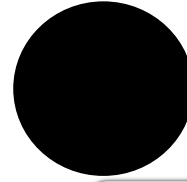
Epidemic Cards

E2M2 modeling workshop from Cara Brook, UChicago

The Set-Up



26 Red Cards
FACE DOWN
“population” pile

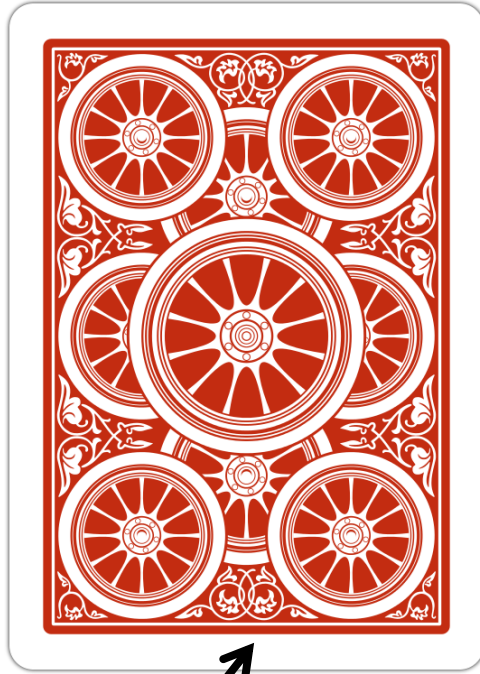
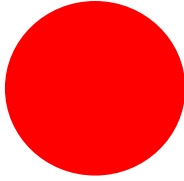


26 Black Cards
FACE UP
“replacement” pile

“current” pile
(EMPTY)

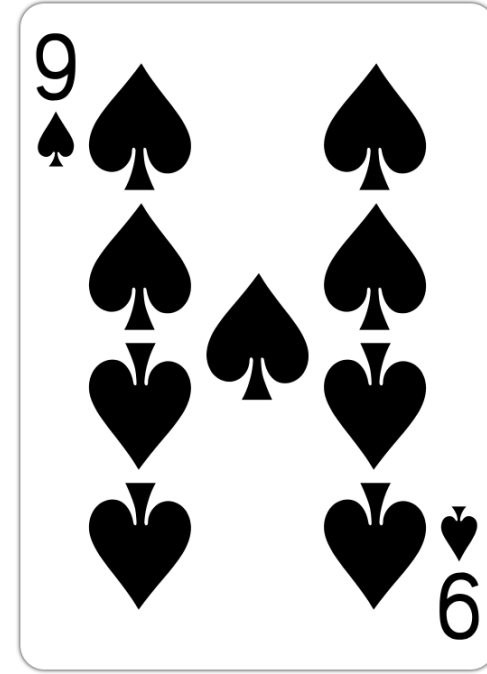
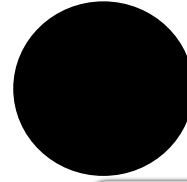
Assumptions

RED cards are susceptible

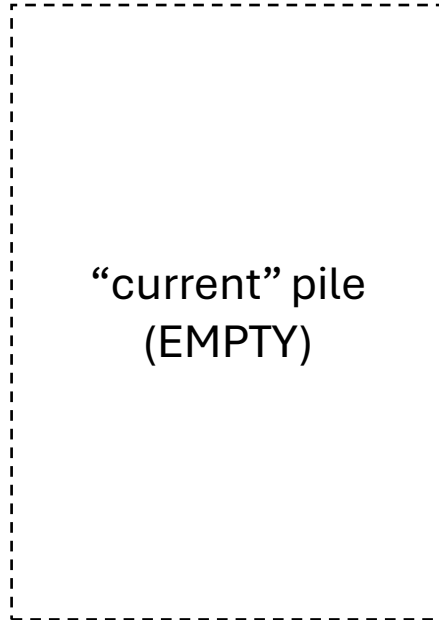


The population pile must
ALWAYS maintain exactly 26
cards.

BLACK cards are immune

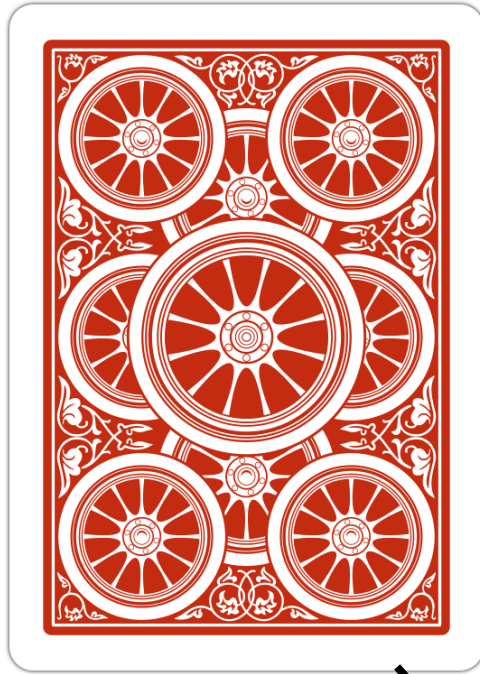


“current” pile
(EMPTY)

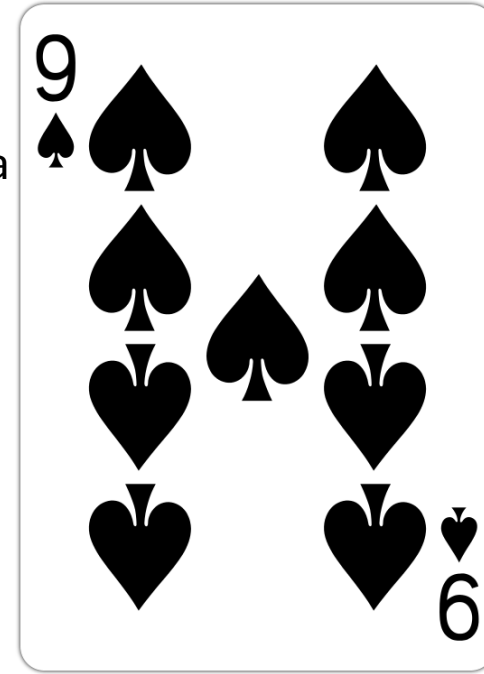
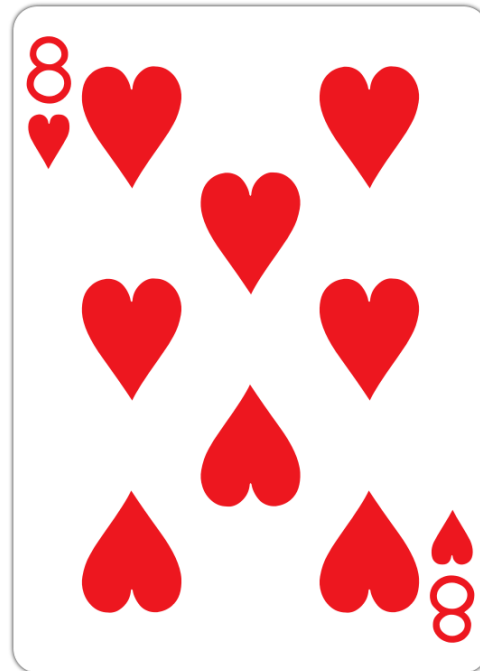


Playing the game

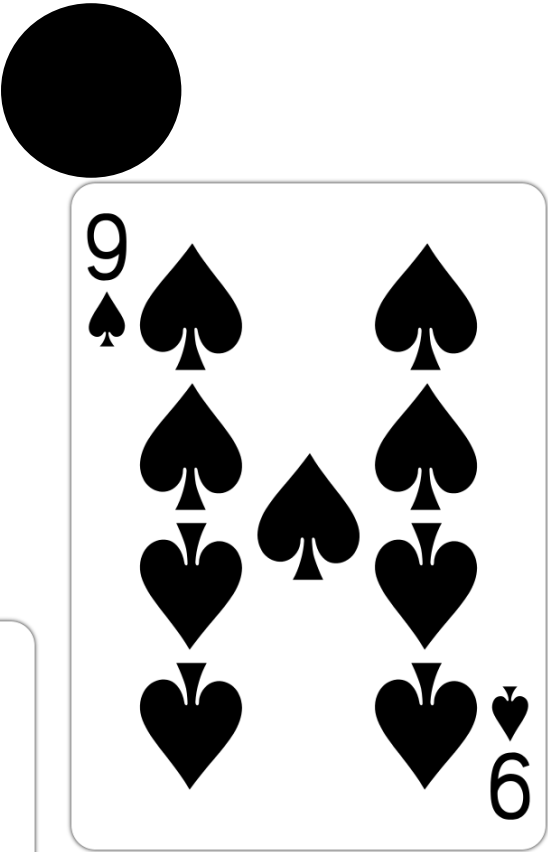
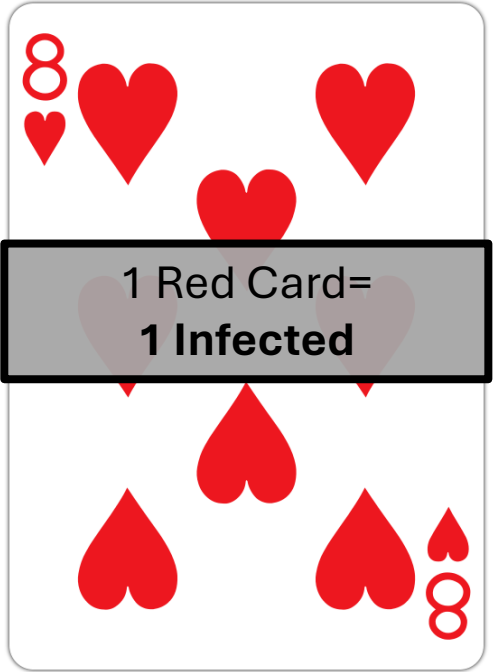
1. Draw one card from the population pile and move, FACE UP, to the current pile.



2. Replace the drawn card from the population pile with a black card from the replacement pile.

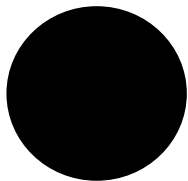
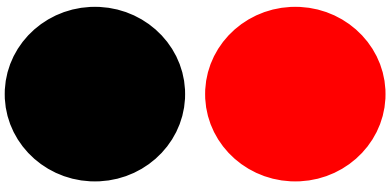


Timestep	Infected	Susceptible	R0
1	1	25	2
2			2
3			2
4			2
5			2
6			2
7			2
8			2
9			2
10			2

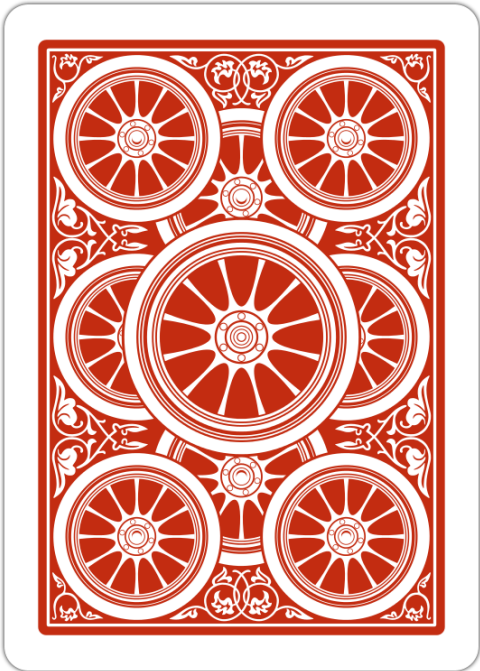


3. Now count.
S = # red cards in population pile
I = # red cards in current pile

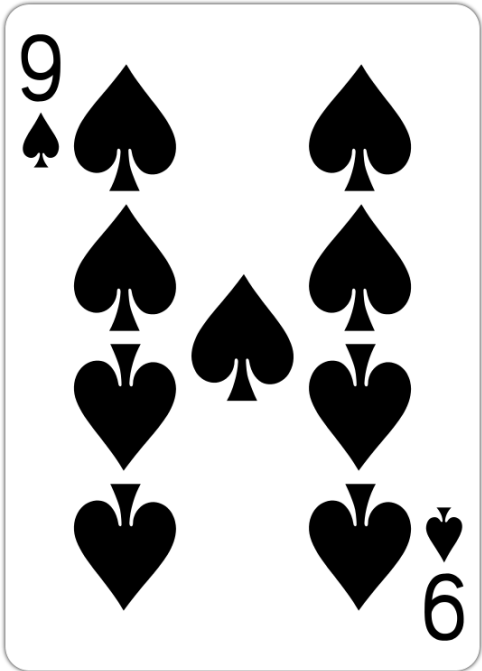
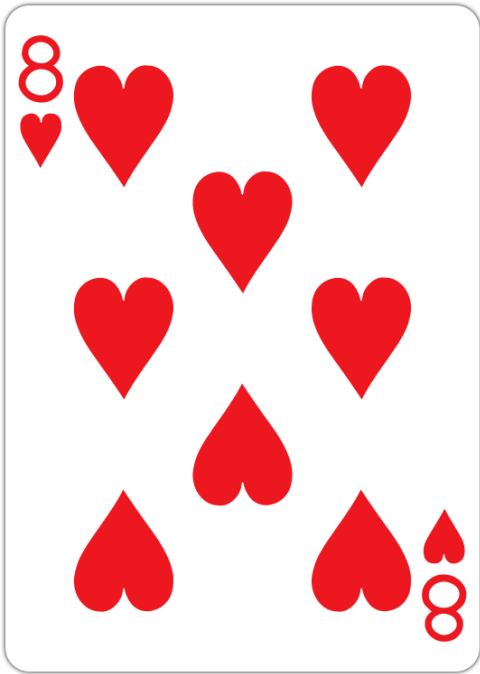
Before timestep 2



25 Red Cards +
1 Black Card
FACE DOWN
“population” pile



1. Shuffle!



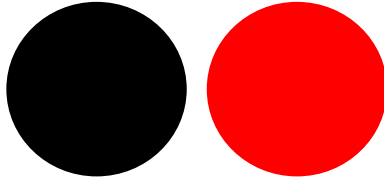
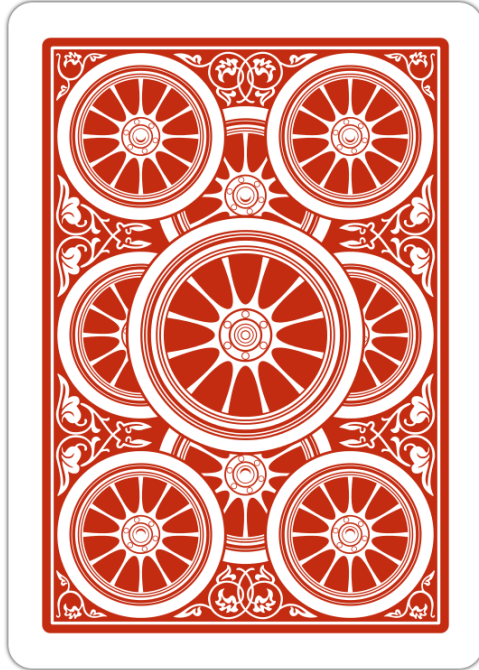
Black Cards
FACE UP
“replacement” pile

Model assumption:
Infected for only one
timestep

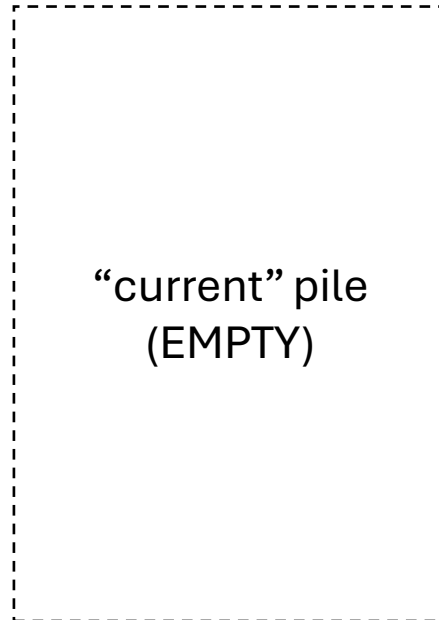
2. Discard



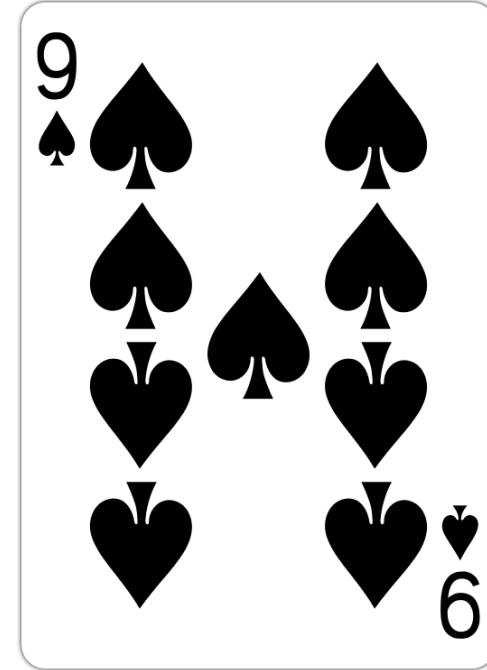
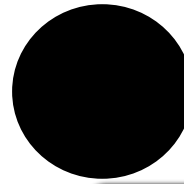
25 Red Cards +
1 Black Card
FACE DOWN
“population” pile



Model
assumption: One
infectious
individual can
cause a potential
of two new
infectious in a
completely
susceptible
population if our R_0
is 2

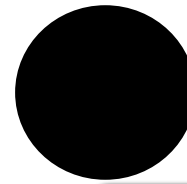
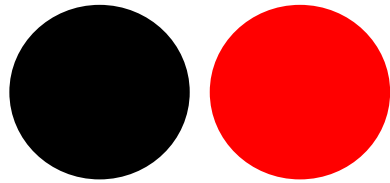


“current” pile
(EMPTY)

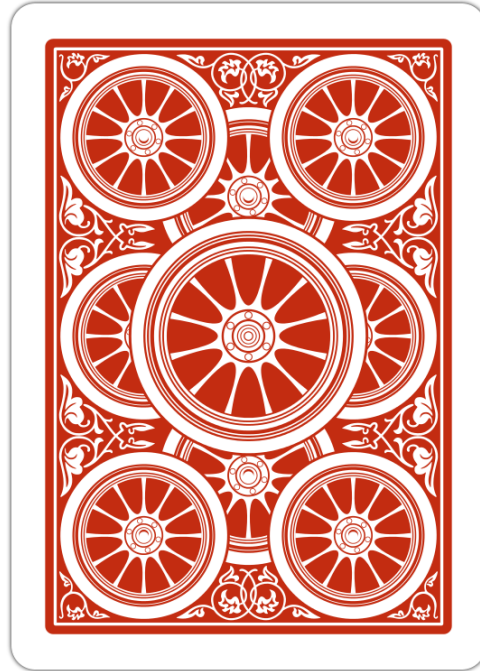


Black Cards
FACE UP
“replacement” pile

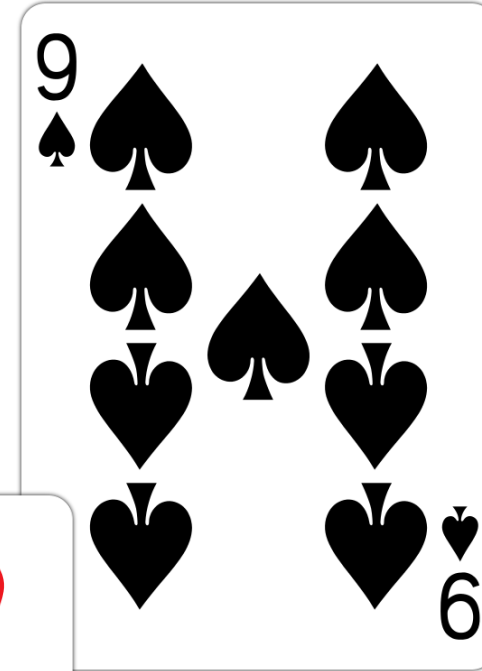
Timestep 2



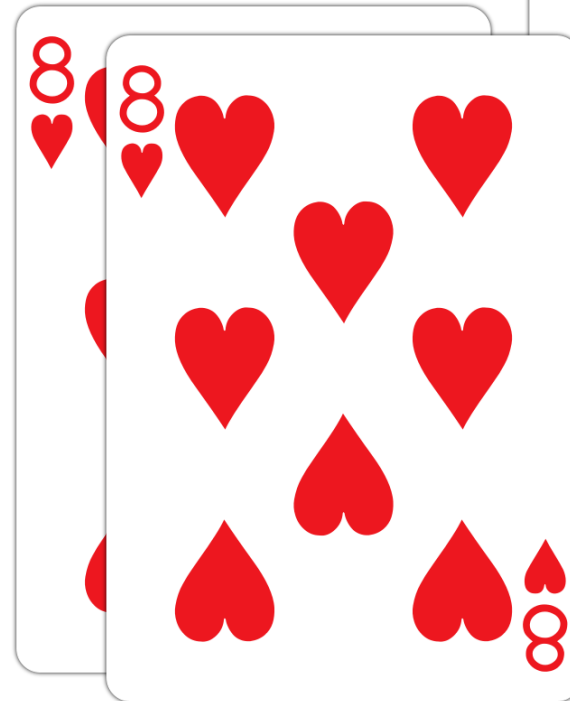
25 Red Cards +
1 Black Card
FACE DOWN
“population” pile



Black Cards
FACE UP
“replacement” pile



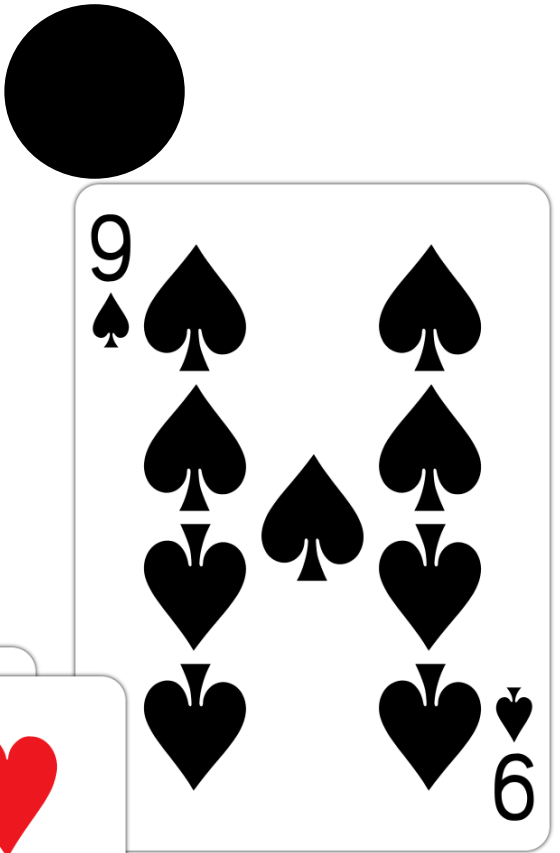
1. Draw $R0 \times I$ new cards (2).
2. Move all red cards from the draw to the current pile.
3. Return any black cards to the population pile, since they are now immune (“Recovered”).



Timestep	Infected	Susceptible	R0
1	1	25	2
2	2	23	2
3			2
4			2
5			2
6			2
7			2
8			2
9			2
10			2



If you drew any black cards, put them back, only replenish the red cards



3. Now count.

S = # red cards in population pile
I = # red cards in current pile

Moving Forward

In timestep 3 if you drew two red cards you will now draw **4** red cards

1. Repeat until you no longer draw red cards, or you run out of cards in the replenish pile.
2. Then, play a second round. except, this time, allow each individual to infect a potential of **three susceptibles** (change R_0 to 3).

Questions to ponder:

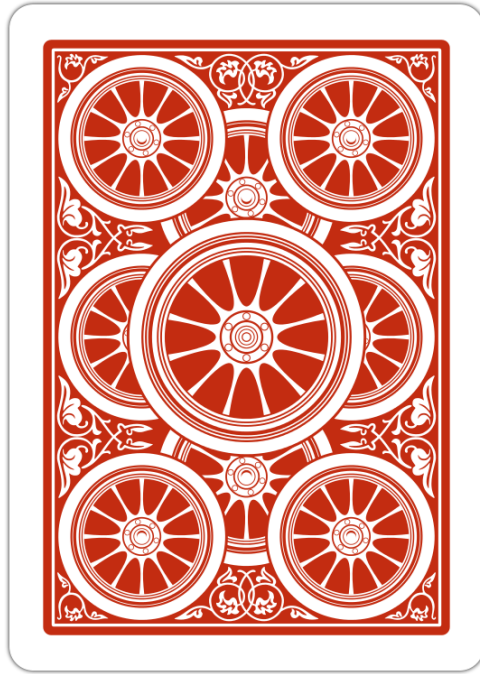
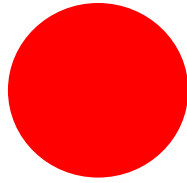
1. If you repeated rounds 1 and 2 and replotted, would they look the same?
2. How did increasing the R_0 change the epidemic?

Comment jouer

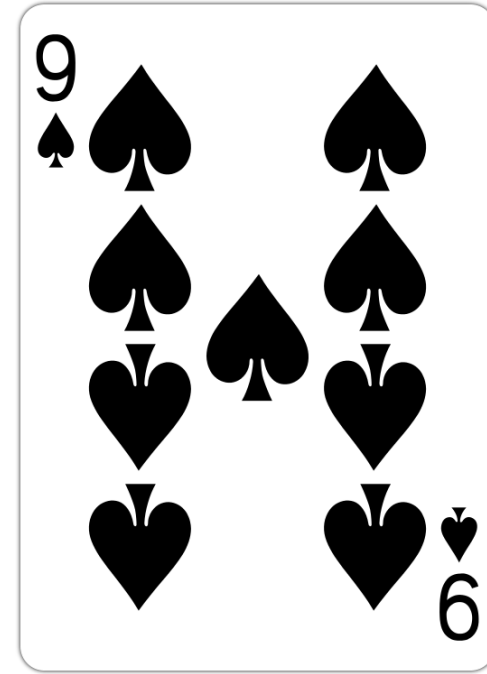
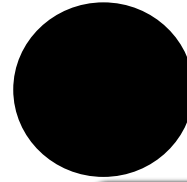
Cartes de L'Epidémie

E2M2 modeling workshop from Cara Brook, UChicago

La mise en place



26 Cartes Rouges
FACE CACHEE
pile de “population”

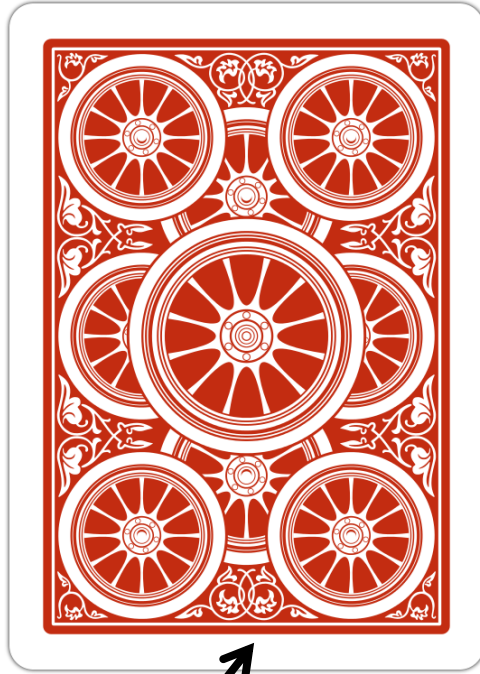
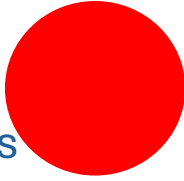


26 Cartes Noires
FACE VISIBLE
pile “remplacement”

pile “actuelle”
(VIDE)

Les hypothèses

Les Cartes ROUGES sont susceptibles

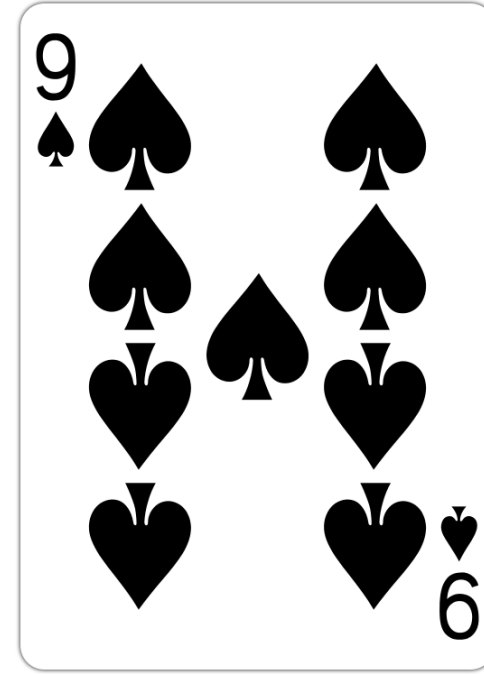
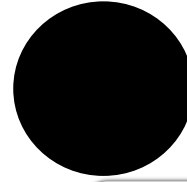


La pile de population doit
TOUJOURS contenir exactement
26 cartes.



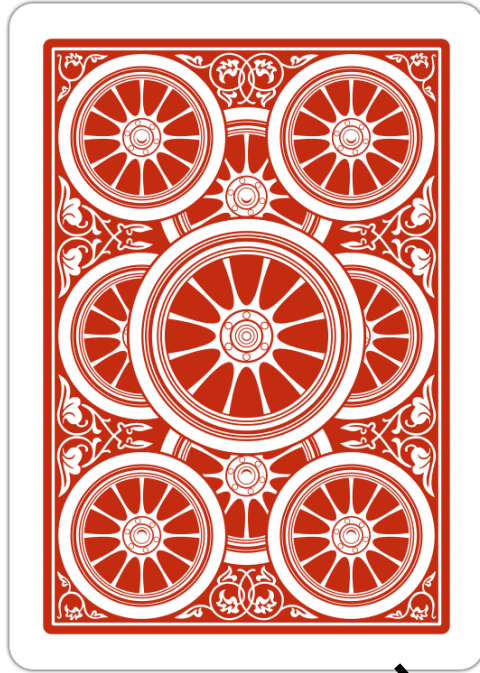
pile "actuelle"
(VIDE)

Les Cartes NOIRES sont immunes

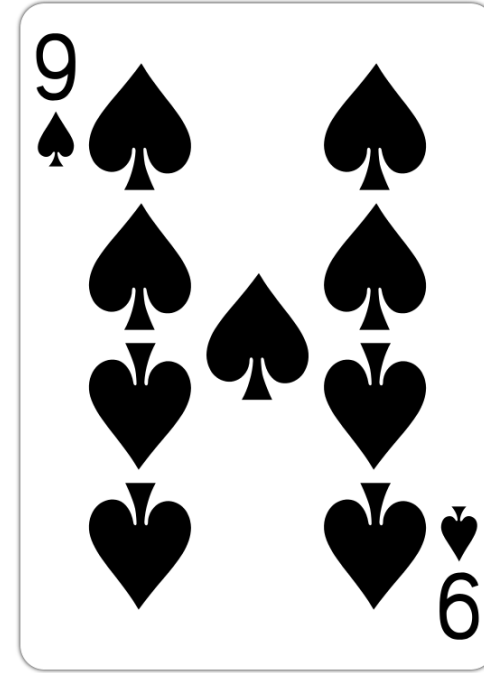
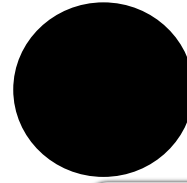
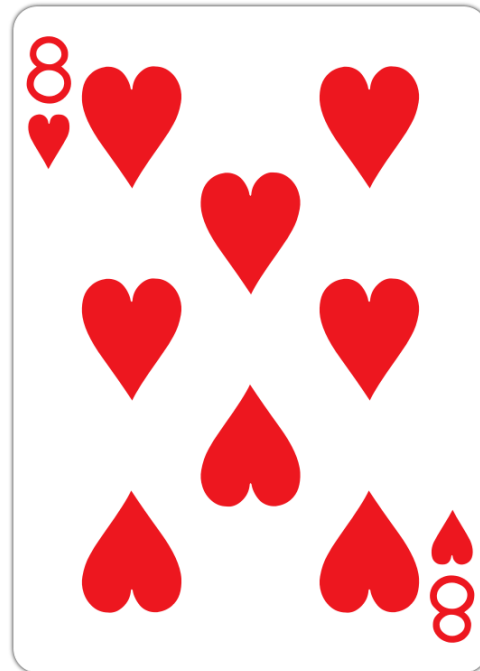


Jouer le jeu

1. Piochez une carte de la pile de population et transférez-le, FACE VISIBLE, a la pile actuel




2. Remplacez la carte piochée de la pile de population avec une carte noire de la pile de remplacement.



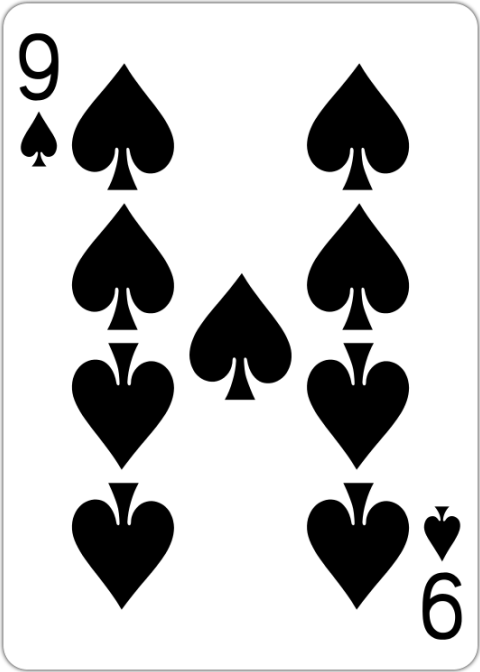
Pas de temps	Infecté	Susceptible	R0
1	1	25	2
2			2
3			2
4			2
5			2
6			2
7			2
8			2
9			2
10			2



25 Cartes Rouges+
1 Carte Noire =
25 Susceptibles



1 Carte Rouge=
1 Infecté



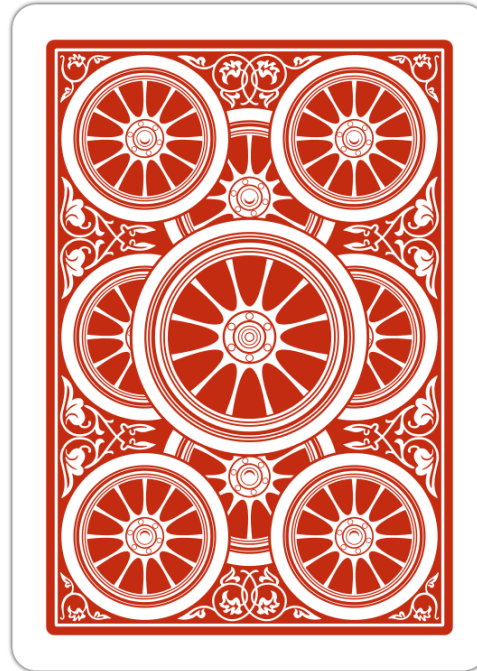
3. Comptez.

S = # cartes rouges
dans la pile de
population

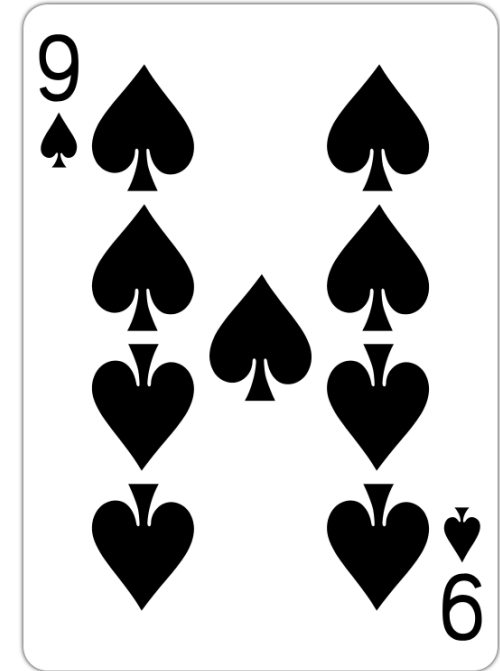
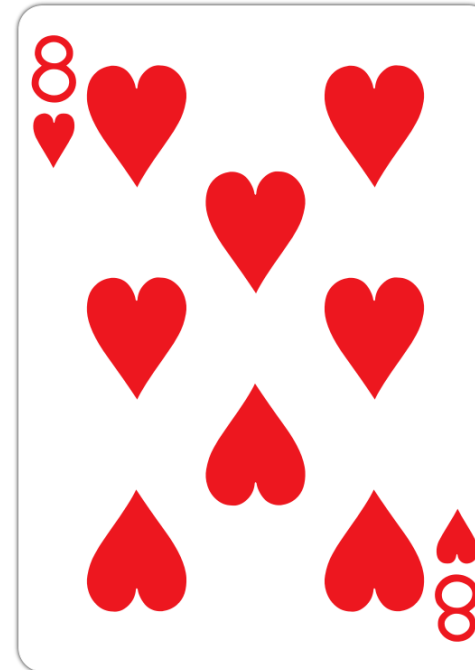
I = # cartes rouges
dans la pile actuelle

Avant le pas de temps 2

25 Cartes Rouges +
1 Carte Noire
FACE CACHÉE
pile de “population”



1. Rebattrez!



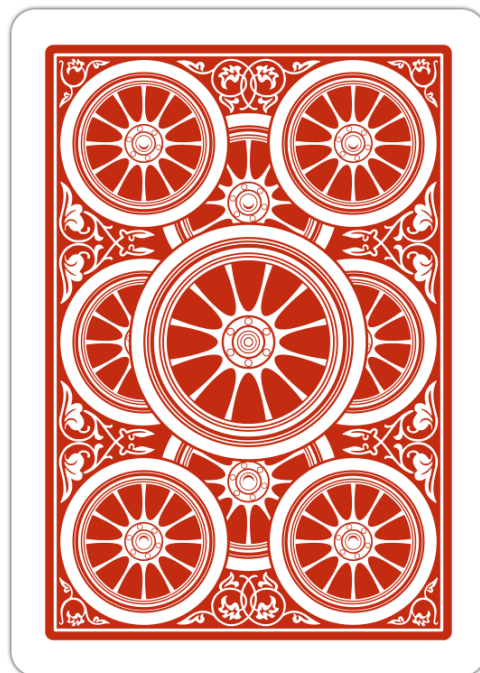
Cartes Noires
FACE VISIBLE
pile de “replacement”

Hypothèse du modèle :
Infecté pendant un seul
pas de temps

2. Jetez

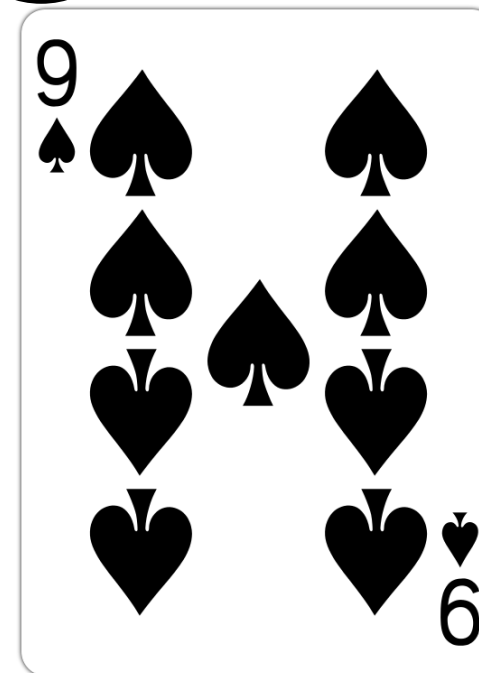


25 Cartes Rouges+
1 Carte Noire
FACE CACHEE
pile de “population”



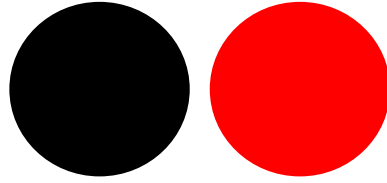
***Hypothèse du
modèle : Un
individu infectieux
peut causer un
potentiel de deux
nouveaux infectés
dans une
population
entièrement
susceptible si le
 R_0 est 2.***

pile “actuelle”
(VIDE)

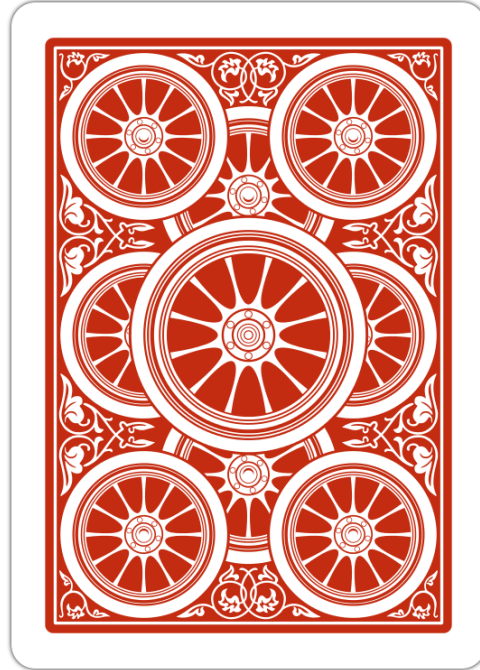



Cartes Noires
FACE VISIBLE
pile de
“replacement”

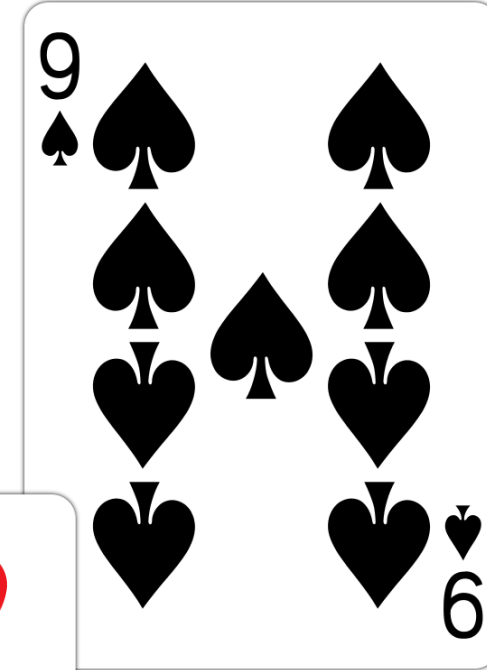
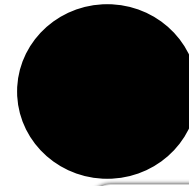
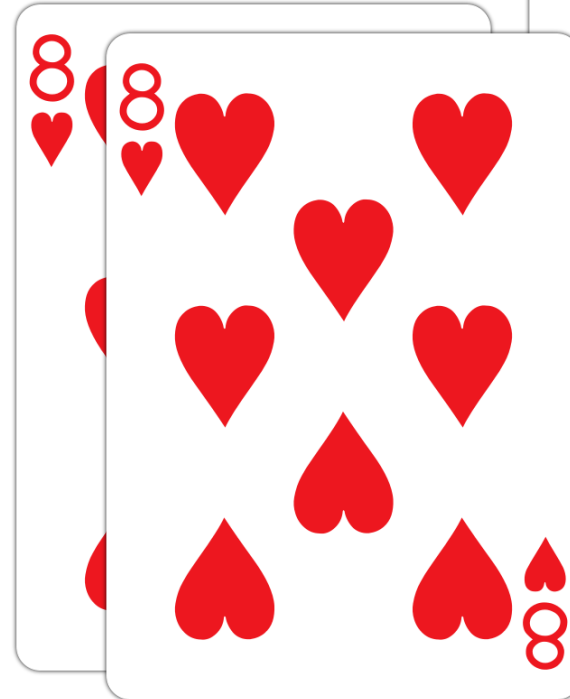
Pas de temps 2



25 Cartes Rouges+
1 Carte Noire
FACE CACHÉE
pile de “population”



1. Piochez $R0 \times I$ nouvelles cartes (2). 
2. Déplacez toutes les cartes rouges du tirage à la pile actuelle.
3. Retournez toutes les cartes noires a la pile de population puis qu'elles sont maintenant immunes (récupérées).

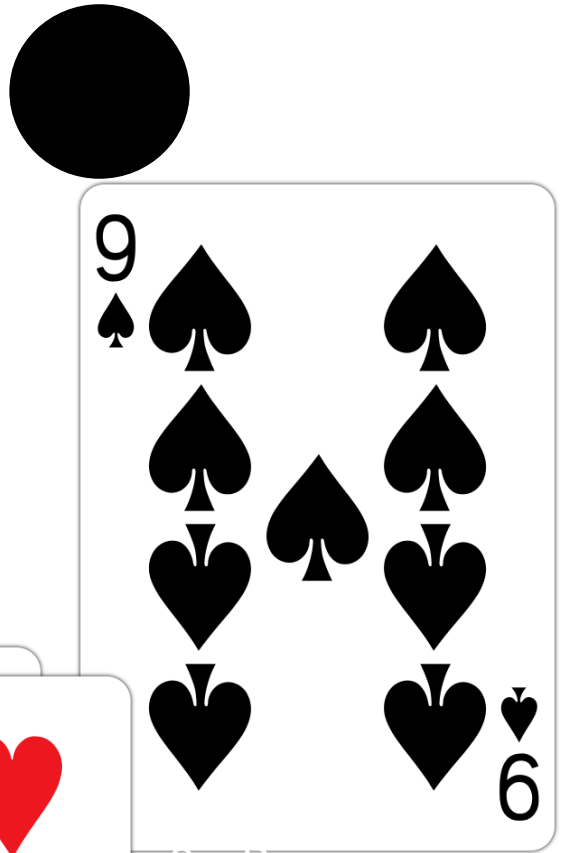


Cartes Noires
FACE VISIBLE
pile de
“replacement”

Pas de temps	Infecté	Susceptible	R0
1	1	25	2
2	2	23	2
3			2
4			2
5			2
6			2
7			2
8			2
9			2
10			2



Si vous avez pioché des cartes noires, remettez-les en place, remplissez seulement les cartes rouges.



3. Comptez.
S = # cartes rouges
dans la pile de
population
I = # cartes rouges
dans la pile actuelle

A l'Avenir

Dans le pas de temps 3, si vous avez pioché deux cartes rouges, vous piocherez maintenant **4** cartes rouges

1. Répétez jusqu'à ce que vous ne piochiez plus de cartes rouges ou que vous n'ayez plus de cartes dans la pile de remplacement.
2. Puis, jouez un deuxième tour, sauf que, cette fois, chaque individu peut potentiellement infecter 3 susceptibles (changez R_0 à 3).

Questions à considérer :

1. Si vous répétiez les tours 1 et 2, auraient-ils la même trajectoire ?
2. Augmenter le R_0 , comment est-ce qu'il a changé l'épidémie ?