

Problem:

A zombie apocalypse has happened and we need to evaluate the possibility of infection of students based on their classes and extracurricular activities within a school in a day.

The premise of this challenge takes place in a high school, which has properties as follows:

- The high school teaches students from grades 9 to 12.
- The high school has 4 total class periods.
- There is a mandated lunch break after the first 2 class periods, where all the students are released for lunch. During this lunch period, all the classrooms are cleaned.
- There are 10 subjects taught at the school: physics, biology, functions, calculus, philosophy, art, drama, computer science, computer engineering, and humanities. Each subject has two sections A and B, which are taught by different teachers.
- Students can have spare periods where they do not have any class scheduled and are free to do anything of their choosing.
- There are 2 teachers per subject, which means there are 20 total teachers in the school.
- There are a total of 580 students in the entire school.
- There are 5 teaching assistants from the local teachers college present at the school.
- The school has various clubs that students participate in every day after school (Board Game Club, Football, Soccer, Video Game Club, Band, Computer Science Club, Choir, Basketball, Badminton, Baseball). Students may participate in multiple clubs after school
- Various students at the school have health conditions

Solution:

- Potentially create student classes that store all attributes of student
 - Last Name (str)
 - First Name (str)
 - Grade (int)
 - P1 class (str)
 - P2 class (str)
 - P3 class (str)
 - P4 class (str)
 - Health condition (boolean)
 - Extra curricular (list of strings)
 - Ident (S-num)
 - Infected (boolean)
- Assume background dictionary
- lunchGroup class:
 - Members (list of int)
- classroom class: (includes extra curriculars)
 - Name (str)
 - lastPeriod (list of int)
 - currentPeriod (list of int)
 - baseEnvRate (int)
 - infectedList (list)

- infectPeriod(infoDict, classrooms, infectedList, baseRate, baseEnvRate) - returns infoDict
- infectLunch(infoDict, infectedList, baseRate)
- computeR0
- Potentially a graph representation of interactions (strengthening edges for repeated interactions)

In 1 day (interaction opportunities)	Chance modifiers
Period 1	
Period switching	Students interact with student from previous periods
Period 2	
Lunch Break	Classrooms are disinfected More likely to hang out with people of the same age
Period 3	
Period switching	Students interact with student from previous periods
Period 4	
Extracurricular	
Going home	Infection for siblings

Possible Solution (2):

- Model every classroom as an object recording previous and current students
- Model every student as an object, residing within classroom