Looks like the process have one initial state and then it goes to recurrent states producing consecutive zeros.

Problem 2. Write up your Project Proposal with the following sections. The result should be 2-3 pages long.

2a. *Goal*: What is your primary project goal? What you would like to learn?

2b. *System*: Describe how the dynamical system is nonlinear and time-dependent.

What's the state space?

What's the dynamic?

Why is the system behavior interesting?

2c. *Dynamical properties*: What dynamical properties are you going to investigate?

2d. *Intrinsic computation properties*: What information processing properties are you going to investigate?

2e. *Methods*: What methods will you use? Why are they appropriate?

2f. *Hypothesis: What is your current guess as to what you will find?
</p>

2g. *Steps*: List the appropriate steps for your investigation; for example, read literature, write simulator, do mathematical analysis, estimate properties from simulation, write up report, and so on.

2h. *Time*: Estimate how long each step will take. Can you complete the project within one month?

Online discussions in social platforms provide a medium for users to share, discuss and shape their opinions and create a community. Users from various demographics, belonging to different stakeholder class and having common interest come together to discuss issues. It gives them an opportunity to learn new information and understand others perspective around the issue.

Despite the growing popularity of discussion platforms like Facebook, Reddit, and Slashdot, these platforms often struggle to provide a constructive discussion climate due to the proliferation of anti-normative behaviors in the discussion space. Anti-normative behaviours root from: user-side (socio-political orientation & ideologies, level of knowledge, personal experience) and platform-side issues (platform affordance, lack of means to enhance social presence and social cues and self-regulation). These issues often derail discussions and lead users to a downward spiral of incivil behaviors which hampers discussion climate and discussion quality. Keeping the project delivery timeline, I am going to focus to understand user-side issues to know how user's own past behavior and as well as other's past behavior influence their behavior on social media platforms. These behaviors are dynamically reflected through users comment on social media platforms. Using these behavioral traces we can use stochastic process we can predict and gain insights into human behaviors. The behavioral feature we are interested in is trolling and flame wars. Trolling/flamming refers to "intentionally incorrect but not overtly controversial". However, the trolls aim at new users who are often naive to understand trolls intention whereas flame wars are directed towards everyone. The goal of the study to understand trolling/flamming contagion through 1) once own past behavior, and 2) other's past behavior.

The project aim to build computational landscape of user's behavior collected from youtube comment section. The use of social media sites' APIs has made it possible to collect user's digital traces left in the form comments and reactions. Using this specific dataset along with Natural Language Process (NLP) techniques, we can code and label trolling and flame wars as expressed by the user about different occasions. Depending on the tool used to code, the content is labeled with various types of trolling and flaming, from this point the creation of different time series for each comment will be created.

My aim for this class project is understand any apply dynamical system theory to social networks present online. The focus would be to build a minimally complex and maximally predictive computational model to investigate trolling contagion online. First autoregressive model would focus on user's own past behavior to predict their future behavior. We use ε-machine which is a unifilar hidden Markov model which only require predictive statistic of the past to predict future of a conditionally stationary stochastic process. In another words, the trolling behavior of users' at time t is can be predicted based on their behavior at time t-1.

Additionally, the project also aim to build alternative autoregressive model suggesting that behavior contagion is not limited to user's own past action but also on past action of their social network. For this model, we need a parallel time-series to indicate the social influence of the present behavior. We put user's own past behavior time series and social influence time series as input to transducer and predict the present behavior through this model (epsilon-transducer). We consider parent comment to the user comment as either their own past behavior if it was generated by user or social influence if there are replying to someone else comment.

This project is inspired by Darmon's (2015) work who applied dynamical system theory to social systems. Similar to his work, Causal State Splitting Reconstruction (CSSR) algorithm will be applied to these two proposed models. We identify the predictive states and distinguish between them if they have similarity less 0.001.

We test our hypothesis that one's social behavior can be self, socially and both self as well as socially motivated.

Literature review- 1 week

Time series elaboration- 2 days

Causal state models analysis- 10 days

Results analysis- 3 days

Write up report- 4 days

In [0]: