* Background and Motivation:
  + This fall: “I’m sure you’ve heard of the talk about “Godzilla” El Nino”, but also about how El Nino can be so hard to predict
    - One scientist: “50 percent accuracy”
  + Got me thinking about El Nino prediction
  + Why is El Nino so important? Billions of $ in damages; agriculture industry (esp. fishing, where El Nino gets its name!)
* Attempted to create new way of predicting El Nino – more specifically, El Nino indices
  + Index: easy to track physical measurement, e.g. sea surface temperature, air pressure
  + Values of indices are closely linked with El Nino occurrences
  + Thus predicting indices is akin to predicting El Nino
* Wrote Python program which took in input data, created model which best fit data, spit out model, tested against training data, and predicted next few vals
  + Structure of Model
    - Recursive equation
    - Combined values from up to past 8 months with constants using arithmetic ops
  + At the heart was an evolutionary algorithm
    - First, create many random models
    - Test all of them, throw out bad ones, and create new ones sharing characteristics of good ones
      * This step known as generation
      * Similarity to Darwin’s theory – finish by relating back to algorithm
* As stated before, wanted to see if I could create a model
  + Note that just 1 other model that used similar methodology, to best of my knowledge
    - This model was quite limited
  + Also had other hypotheses: generations vs accuracy of final model, number of models at each generation vs final accuracy
* Armed with the program, I tried three factors: SOI, Nino 3.4, LA Rainfall
  + Why rainfall? Wanted to test an effect as well, and rainfall is arguably most significant effect of El Nino, esp. in southern US
  + SOI – 55.6% error, Nino 3.4 – 3% error, Rain – 23% error
  + Number of generations – no effect, Number of models – increasing increased acc
* Discuss predictions: SOI -- ???, Nino 3.4 – lowering, thus less El Nino, Rainfall – lowering and leveling off
* Improvements
  + More values, not single variate – more robust
    - Indices such as Nino 1-4
  + Creating a local model by incorporating smaller factors
    - In the end, predict precipitation for smaller region (not done in past!)
    - Can my model correctly predict underwhelmingness of current El Nino?
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