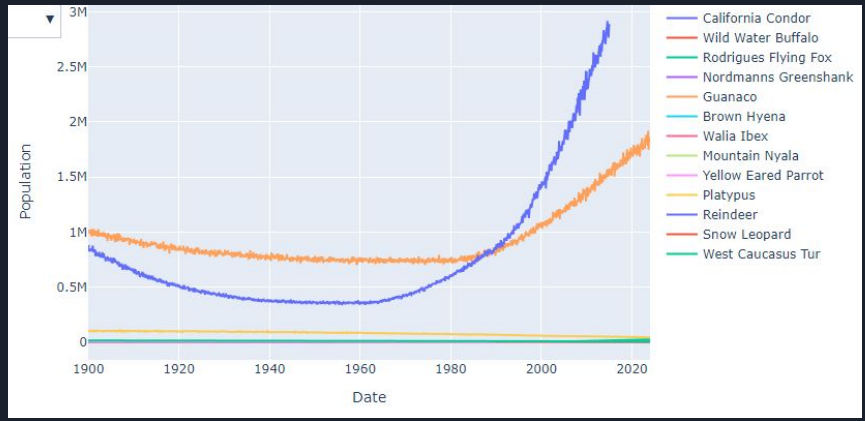
William Harper

- Worked on population datasets
  - Animal population data is exceedingly rare due to difficulties in reliably gathering animal data
  - With permission, I developed an algorithm to create demonstration datasets from what estimates can be found online
  - Spline interpolation was originally used, but it created data with wild bends that aren't going to typically resemble the way animal populations naturally rise and decline
  - PCHIP interpolation is a piecewise shape preserving cubic representation that isn't prone to such wild bends
  - 12 datasets were created for the following animals

California Condor, Brown Hyena, Wild Water Buffalo, Rodrigues Flying Fox, Nordmann's Greenshank, Guanaco, Walia Ibex, Mountain Nyala, Yellow Eared Parrot, Platypus, Reindeer, Snow Leopard, West Caucasus Tur

I tried to have at least 3 or 4 population estimates for each species to use for interpolation.

Without exception, all listed species have at least 1 population estimate from a reputable source, and a population trend (increasing/decreasing) that is sourced from the IUCN



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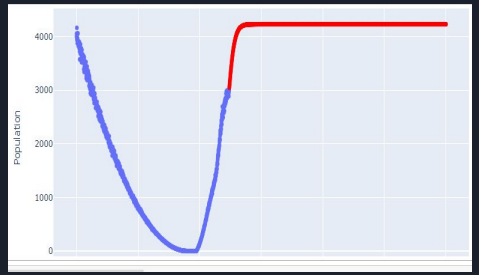
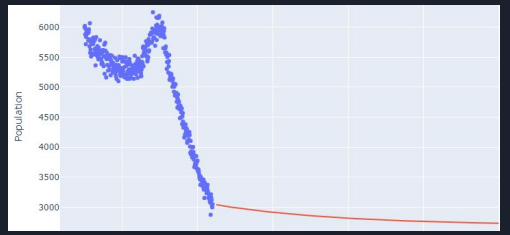
- After datasets were created, machine learning techniques were applied to make predictions on future populations.
- Regression analysis
  - Led to more realistic predictions for species with declining populations
  - Led to unrealistic population explosions for species with increasing populations
- Long short term memory
  - Led to more realistic predictions for species with increasing populations
  - Led to plateaus in decreasing populations that fail to give an impression of “Time to Extinction”
  - Also took an onerous amount of time to generate



Long Short Term Memory



Snow Leopard

Yellow Eared Parrot

Regression Analysis