Day 1 HPC Notes

What is Neutral Theory?

- Assumes all individuals are ecologicall equivalent
- An example of an individual based model
    - fundamental components of the model: Indiv organisms `instead of` species
- Some misunderstanding in terms of Neutral Theory:
    - Neutral model is NOT a null model
      > Null model is a model using in `statistics`, neutral model is a `mechanistic model` in ecology (maybe used as a null model, but not necessarily)
    - Neutral model does NOT assume the `species` are the same.
      > Nuetral models assume that `all individuals` are the same instead of species
    - The demographic properties of an individual are `independent` of its species indentity
    - A model in which species are interchagneable is NOT always nuetral.

Neutral Models (Examples)

Process of Neutral Models

- Individual dies `at random`
- Leaving gap in the community
- The gap filled with the offspring of another indiv. `chosen at random`

> We may have new species enterring into the system and filling the gap (Occationally)

Voter Model

- **Process of Voter Model**
    - Pick a random neighbor
    - Taking their view or they take yours
    - *Occasionally someone introduces a new view*
- **The Results of Voter Model**
    - Without any new ideas being injected into the system, eventually everyone holds the same view.
    - This is a `dynamic equlibrium`.
- **Variations on the theme**
    - The zero sum assumption
        - A indiv. has to be died before another indiv to be born
        - The total number of indiv are the same
    - Speciation mode (Random fission/protracted)

- Spatial structure (Non spatial/spatially implicit)

Uses of Neutral Theory