

Introduction to Mathematical Modeling

Professor:

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OFFICE: AHN229

Age Class Model - Perennial plant that can skip stages

A species of perennial plant has five possible stages:

- First year dormant seed
- Second year dormant seeds
- Small non flowering rosettes
- Medium non flowering rosettes
- Large non flowering rosettes
- Flowering plants

ASSUMPTIONS

- Not all seeds are dormant for two years, some become small rosettes after just one year.
- Plants can skip some of the non flowering stages, however, they all start as small rosettes.

- Plants can remain in any of the rosette stages for multiple years.
- Only flowering plants can produce seeds.
- After producing seeds the plants die.

Your goal is to do the following

1. Draw a state diagram to model the flow of plants through this system. As part of this define your variables: birth rate, survival rate, populations.
2. Write down the recurrence relations for this system.
3. Convert the recurrence relations into Matrix Form.
4. IF TIME - see if you can code this up using Freemat or a spreadsheet.

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