

## Linked Lists Invariants

- How should we represent a linkedlist?
  - Represent it with Nodes (contains value), start, end, and what each thing points to (next)
  - Empty list: start and end both point to null
- Ghost variables
  - We can add ghost variables that don't exist in the system we're modeling
  - Contains the "expected" behavior
  - Use it later to check if our system is correct
- A few predicates ensuring well-formedness:
  - Every index to have zero or one next
  - Every index has zero or one item
  - Ensure indices in the ghost relation are continuous (so we can index it properly)
- Specify a transition: what does it mean for us to add to the start of the list?
  - We need a node in the prestate that wasn't in the list before
  - Constrain all the poststate fields (i.e. what start', end', etc. all become) based on what they are in the prestate