



UC Berkeley EECS
Lecturer
Michael Ball

Computational Structures in Data Science

Data Structures: Linked Lists



Computing In the News

- [AI News Bias Tool Created By USC Computer Scientists, Amy Blumenthal | November 6, 2020](#)
- USC computer scientists have developed a tool to automatically detect bias in news.
- The work, which combines natural language processing and leverages moral foundation theory to understand the structures and nuances of content that are consistently showing up on left-leaning and right-leaning news sites, was presented at the International Conference on Social Informatics in the paper “Moral Framing and Ideological Bias of News.”
- The researchers intend to help consumers understand viewpoints that are being presented when they are unfamiliar with a news source.



Class Updates

- Please checkout the L&S Updates relating to P/NP options
 - Remember: CS88 is not curved.
 - P == C- == 190/400 points (straight sum)
- Ants project is out later today!
 - 2 parts, partner project
 - Early Checkpoint, Composition Grading, Extra Credit Options!
- No lecture Weds 11/11 – Holiday
- Not many lectures left, but a few big concepts!



Why "Data Structures"? (Next 2 lectures)

- Data Structures
 - OOP helps us organize our *programs*
 - Data Structures help us organize our data!
 - You already know lists and dictionaries!
 - We'll see two new ones today
- Enjoy this stuff? Take 61B!
- Find it challenging? Don't worry! It's a different way of thinking.



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Linked Lists



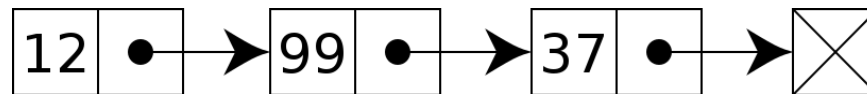
Data Structures

- A data structure is a way to organize or *model* a bunch of independent pieces of data.
 - Lists (arrays)
 - Dictionaries
 - Tuples
- A class, on its own, is *not* necessarily a data structure, it represents a new data type.
 - a "car" or a "person" is an instance of that data type.
 - Lists, Dicts, etc are also data types; their goal is to organize other data.
- These are common patterns that can be used to solve a wide variety of problems.
- Sometimes we're giving structure to make it easier as a programmer, sometimes we're trying to be fast or efficient. (Next lecture!)



Linked Lists

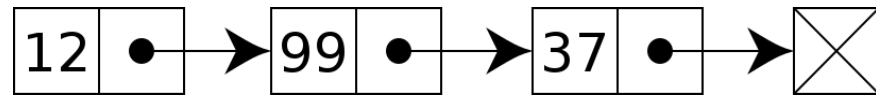
- A Recursive List, sometimes called a "rlist"
- Linked lists contain other linked lists
- A series of items with two pieces:
 - A value, usually called "first"
 - A "pointer" to the rest of the items in the list.



- We'll use a very small Python class "Link" to model this.



Recursion Is Implicit



`self.rest`

