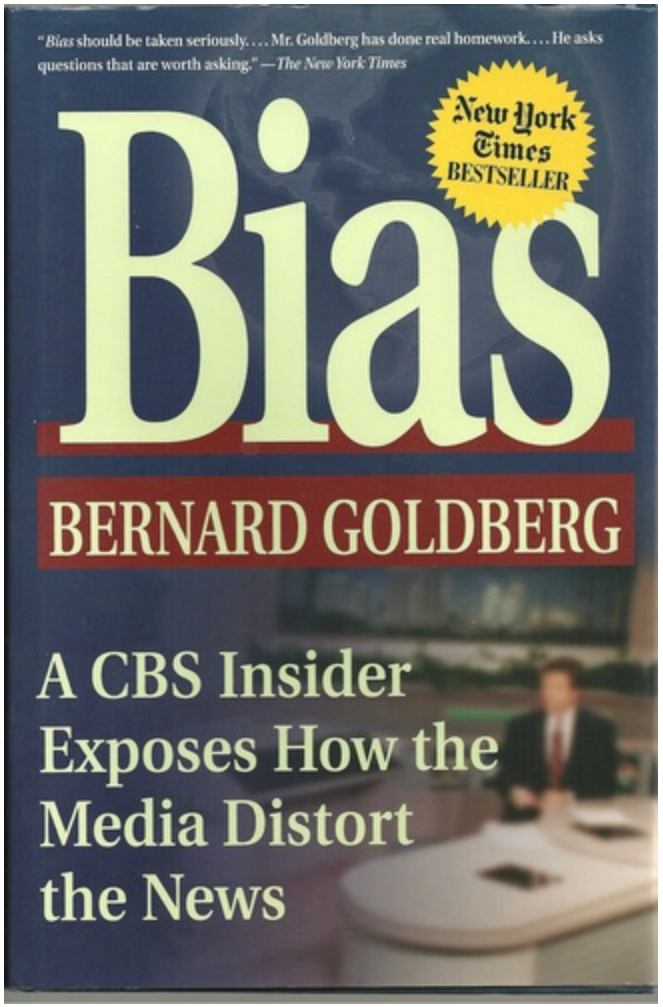
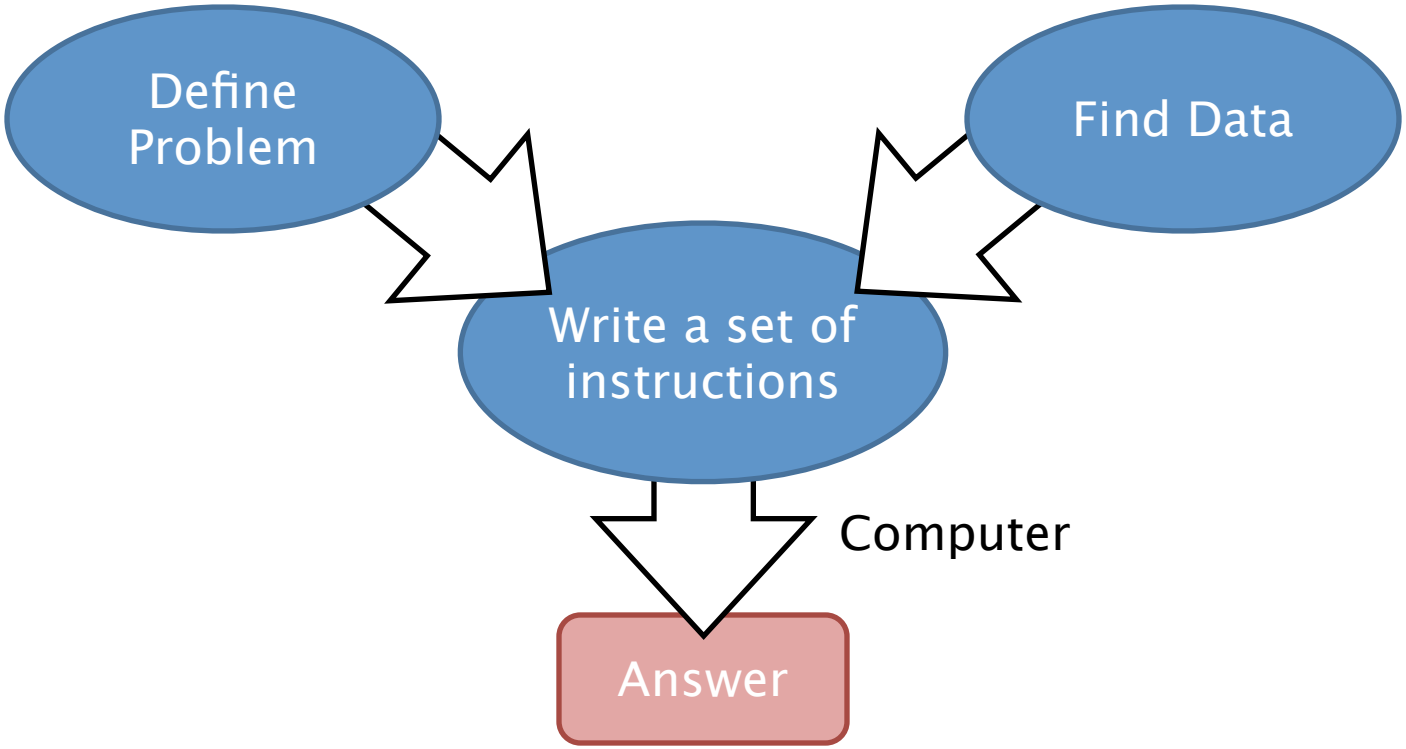
Voting Patterns

Jan 29, 2013

Last Class: Liberal Media Bias

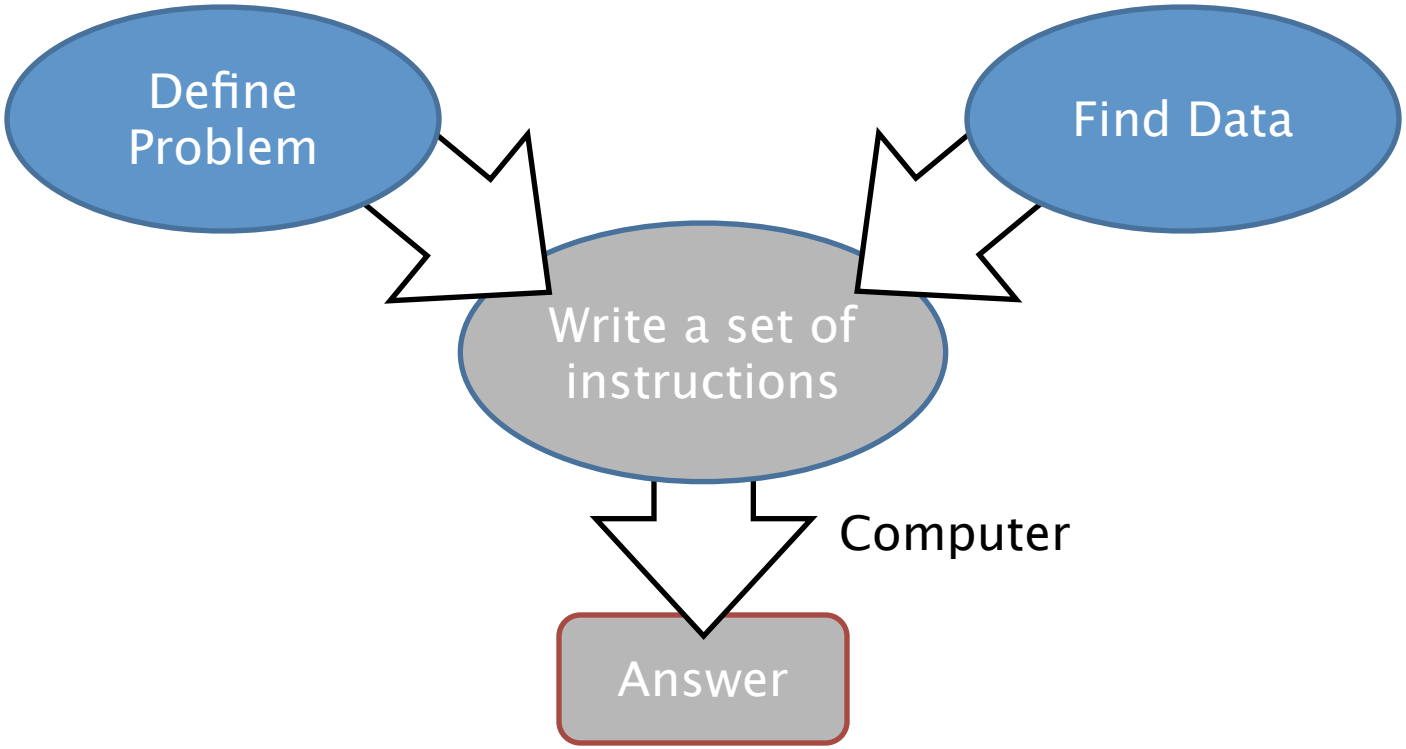


Last Class



"On the Bias." Geoffrey Nunberg, on NPR's Fresh Air

Today


Define Problem
Find Data
Write a set of instructions
Computer
Answer

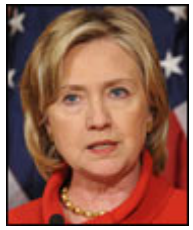
Problem Definition

Conservatives





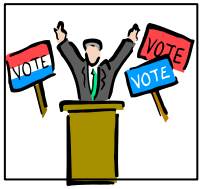
Liberals


Problem Definition

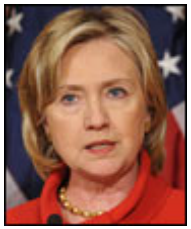
Conservatives

How Liberal/Conservative is



?

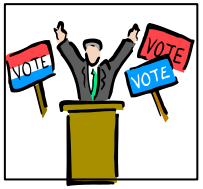
Liberals



Problem Definition

Conservatives

How Liberal/Conservative is

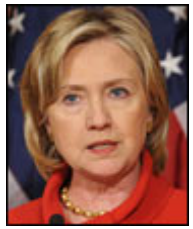


?

How Liberal/Conservative was

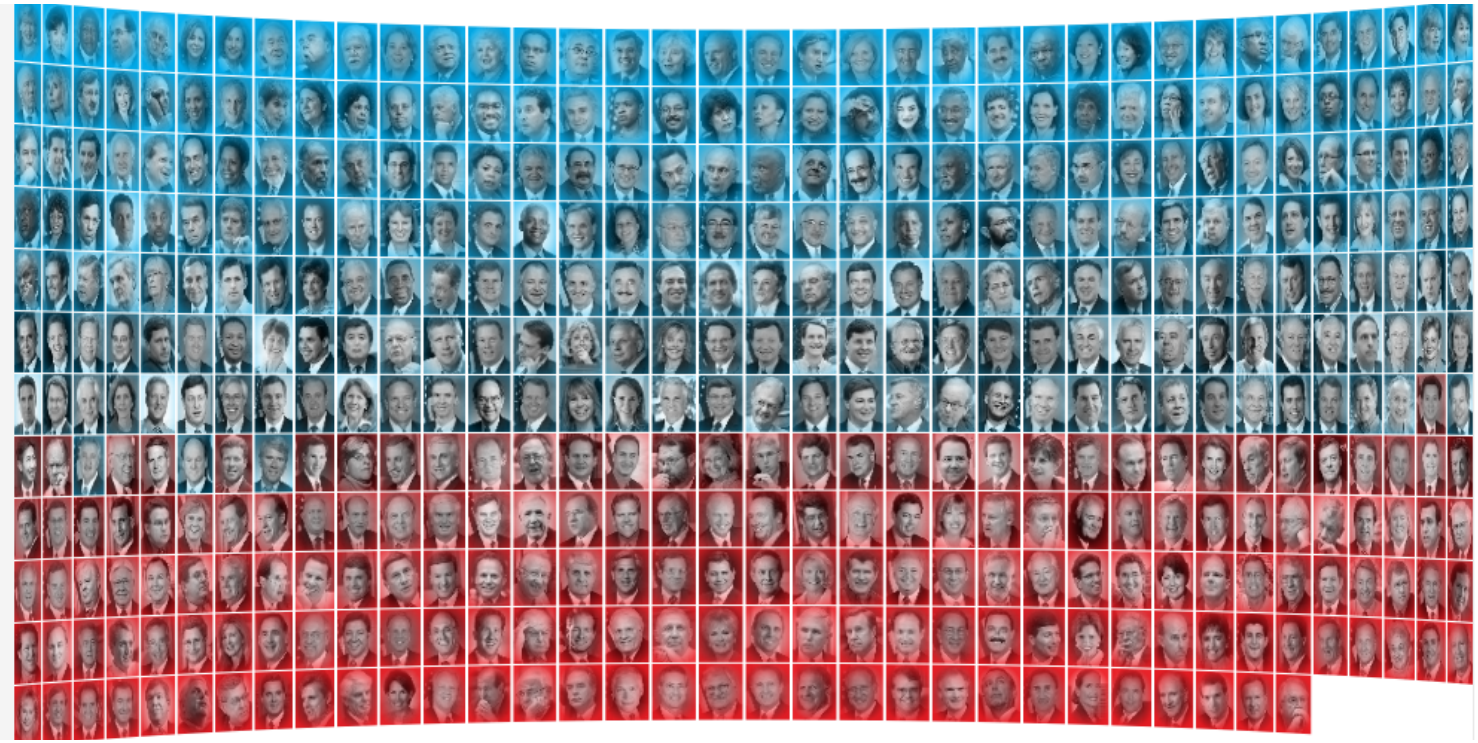
?

Liberals



Problem Definition

- Consider a set of politicians
- Rank them somehow



Problem Definition

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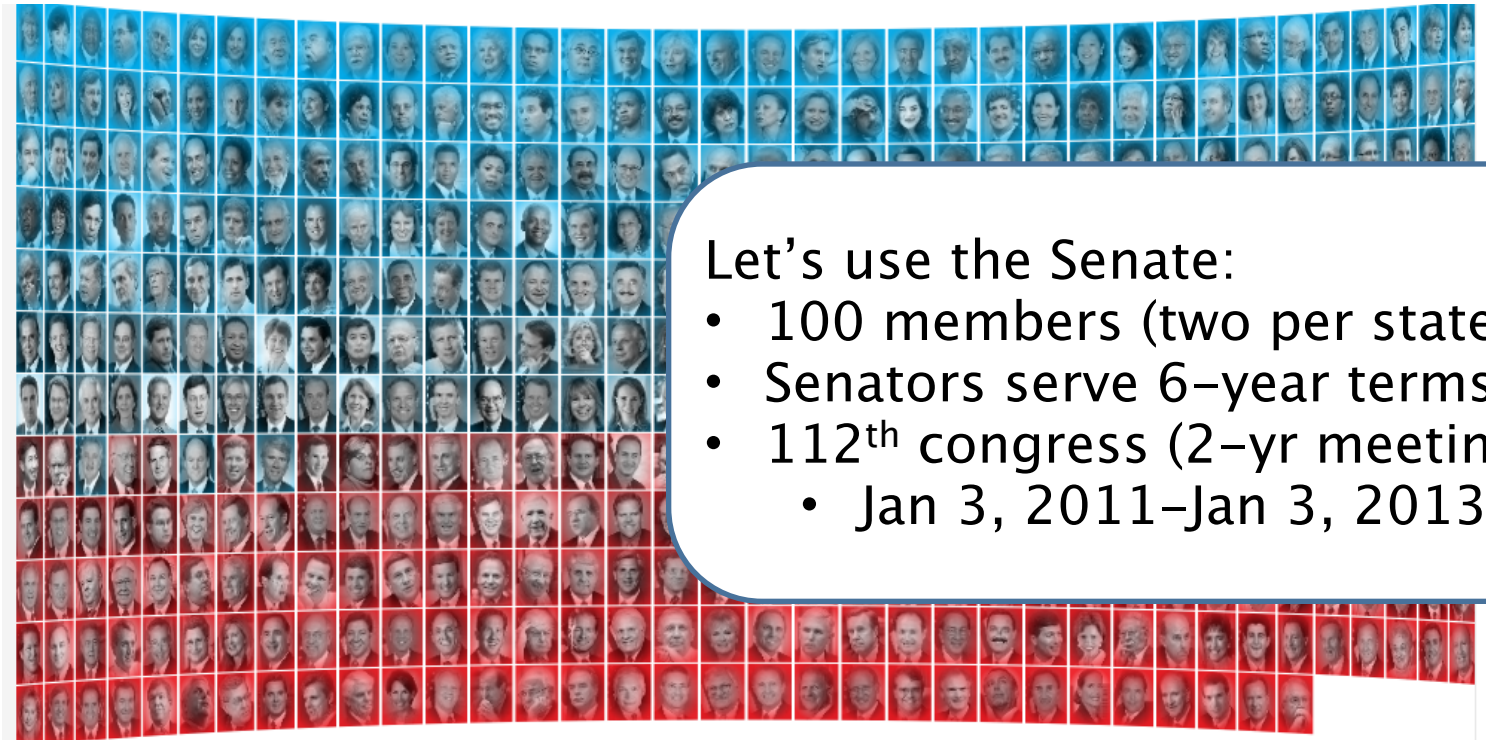


Let's use the Senate:
- 100 members (two per state)
- Senators serve 6-year terms
- 112th congress (2-yr meeting)
  - Jan 3, 2011–Jan 3, 2013

Problem Definition

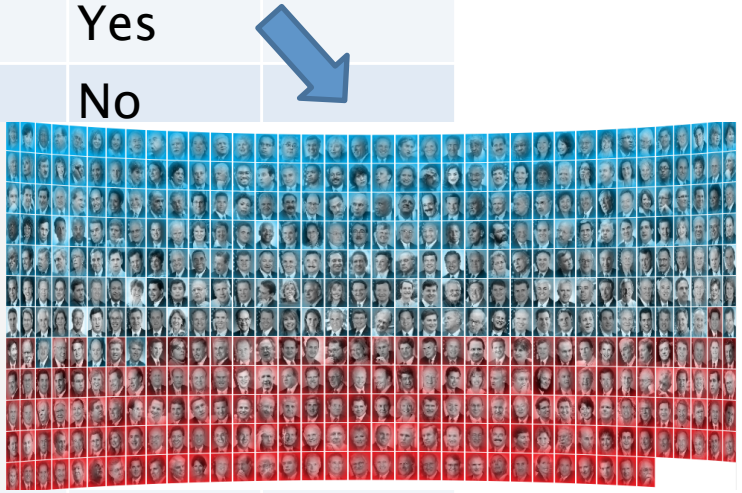
- They vote on the same bills

	Senator	Bill 1	Bill 2	Bill 3	Bill 4	…
	A	Yes	No	Yes	Yes	
	B	No	Yes	No	Yes	
	C	Yes	Yes	Yes	Yes	
	D	Yes	No	Yes	Yes	
	E	No	Yes	No	No	
	F	Yes	No	Yes	Yes	
	G	No	No	No	No	
	H	No	Yes	No	No	
	I	No	No	No	No	
	…					

Problem Definition

- They vote on the same bills

Senator	Bill 1	Bill 2	Bill 3	Bill 4	…
A	Yes	No	Yes	Yes	
B	No	Yes	No	Yes	
C	Yes	Yes	Yes	Yes	
D	Yes	No	Yes	Yes	
E	No	Yes	No	No	
F	Yes	No	Yes		
G	No	No	No		
H	No	Yes	No		
I	No	No	No		
…					



Problem Definition

- Idea: Pick one senator and rank relative to them

	Senator	Bill 1	Bill 2	Bill 3	Bill 4	…
★ 	A	Yes	No	Yes	Yes	
	B	No	Yes	No	Yes	
	C	Yes	Yes	Yes	Yes	
	D	Yes	No	Yes	Yes	
	E	No	Yes	No	No	
	F	Yes	No	Yes	Yes	
	G	No	No	No	No	
	H	No	Yes	No	No	
	I	No	No	No	No	
	…					

Problem Definition

- Idea: Pick one senator and rank relative to them

	Senator	Bill 1	Bill 2	Bill 3	Bill 4	…
★ 	A	Yes	No	Yes	Yes	
	B	Diff	Diff	Diff	Same	
	C	Same	Diff	Same	Same	
	D	Same	Same	Same	Same	
	E	Diff	Diff	Diff	Diff	
	…					

Problem Definition

- Idea: Pick one senator and rank relative to them

	Senator	Bill 1	Bill 2	Bill 3	Bill 4	…
★ 	A	Yes	No	Yes	Yes	
	B	Diff	Diff	Diff	Same	
	C	Same	Diff	Same	Same	
	D	Same	Same	Same	Same	
	E	Diff	Diff	Diff	Diff	
	…					

[Most Liberal] A D C B E [Most Conservative]

Problem Definition

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Claim: We can tell how liberal or conservative a senator is compared to his/her peers using their voting record.

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Test: Rank all senators by how similar they vote compared to a particular liberal senator.

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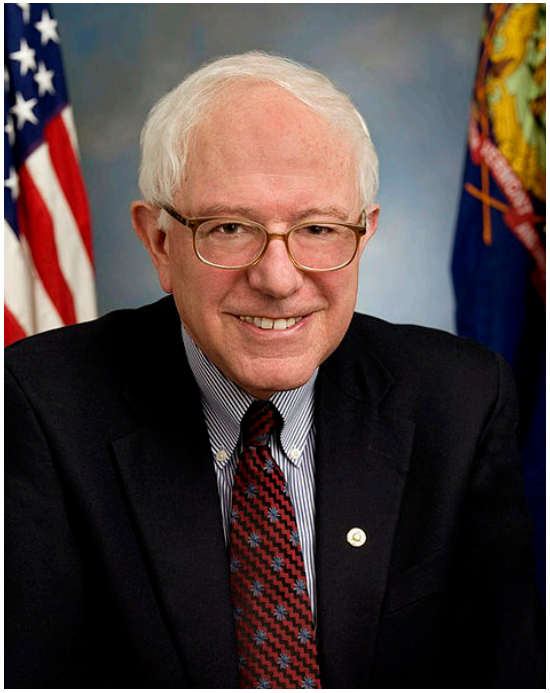
Test: Rank all senators by how similar they vote compared to a particular liberal senator.

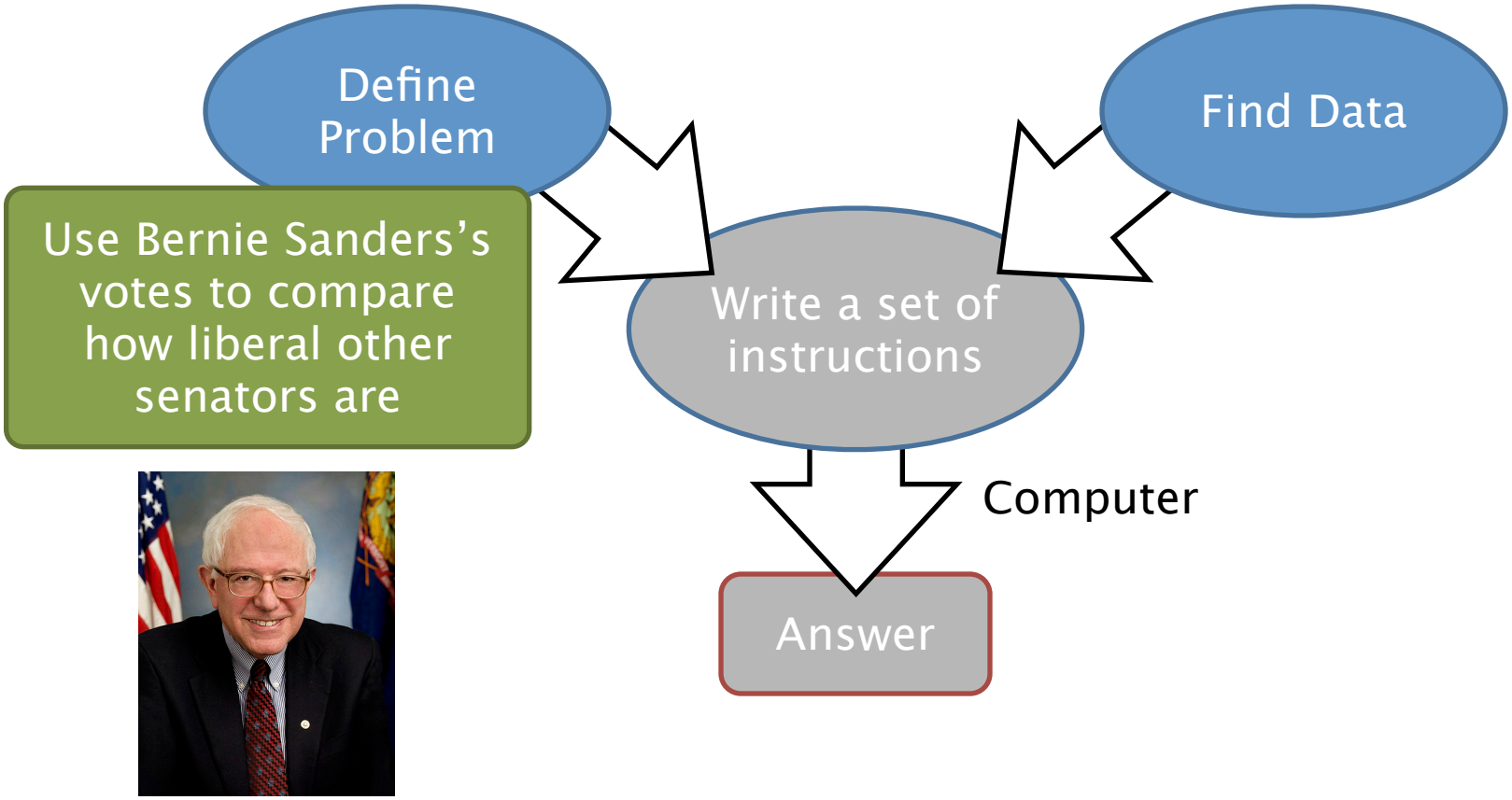
The Big Question: Who do we use?

Bernie Sanders



- Co-founder of Congressional Progressive Caucus
- Long record among current senators rated as most liberal
- Name recognition
- More liberal than the most conservative conservatives are conservative?
- No more Ted Kennedy

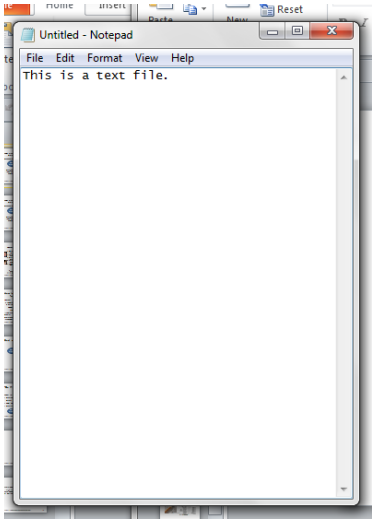
Today's Class



Break

Types of Data

vs.



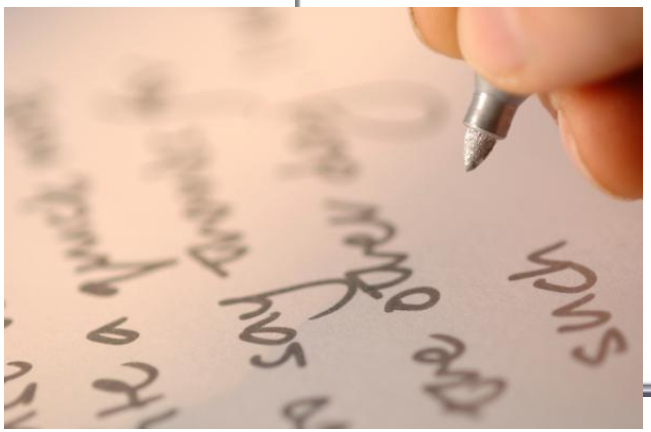
vs.

```
01010101010
00001010101
00101100101
01010101001
10010101010
10100101010
10010100100
000
```

Hard for Computers, Easy for Humans

Hard for Computers, Easy for Humans

http://networkprogramming.wordpress.com/2009/09/



sciencedaily.com

Hard for Computers, Easy for Humans

The Turing Test

- **Interrogator:** In the first line of your sonnet which reads 'Shall I compare thee to a summer's day', would not 'a spring day' do as well or better?
- **Computer:** It wouldn't scan.
- **Interrogator:** How about 'a winter's day'? That would scan all right.
- **Computer:** Yes, but nobody wants to be compared to a winter's day.
- **Interrogator:** Would you say Mr. Pickwick reminded you of Christmas?
- **Computer:** In a way.
- **Interrogator:** Yet Christmas is a winter's day, and I do not think Mr Pickwick would mind the comparison
- **Computer:** I don't think you're serious. By a winter's day one means a typical winter's day, rather than a special one like Christmas.

Hard for Computers, Easy for Humans

Photo Classification

20 labeled photos each of:
Donald Rumsfeld
Tony Blair
Colin Powell
George W. Bush

Given an unlabeled photo, can we figure out who it is?

http://scikit-learn.org/0.9/auto_examples/applications/face_recognition.html

Hard for Computers, Easy for Humans

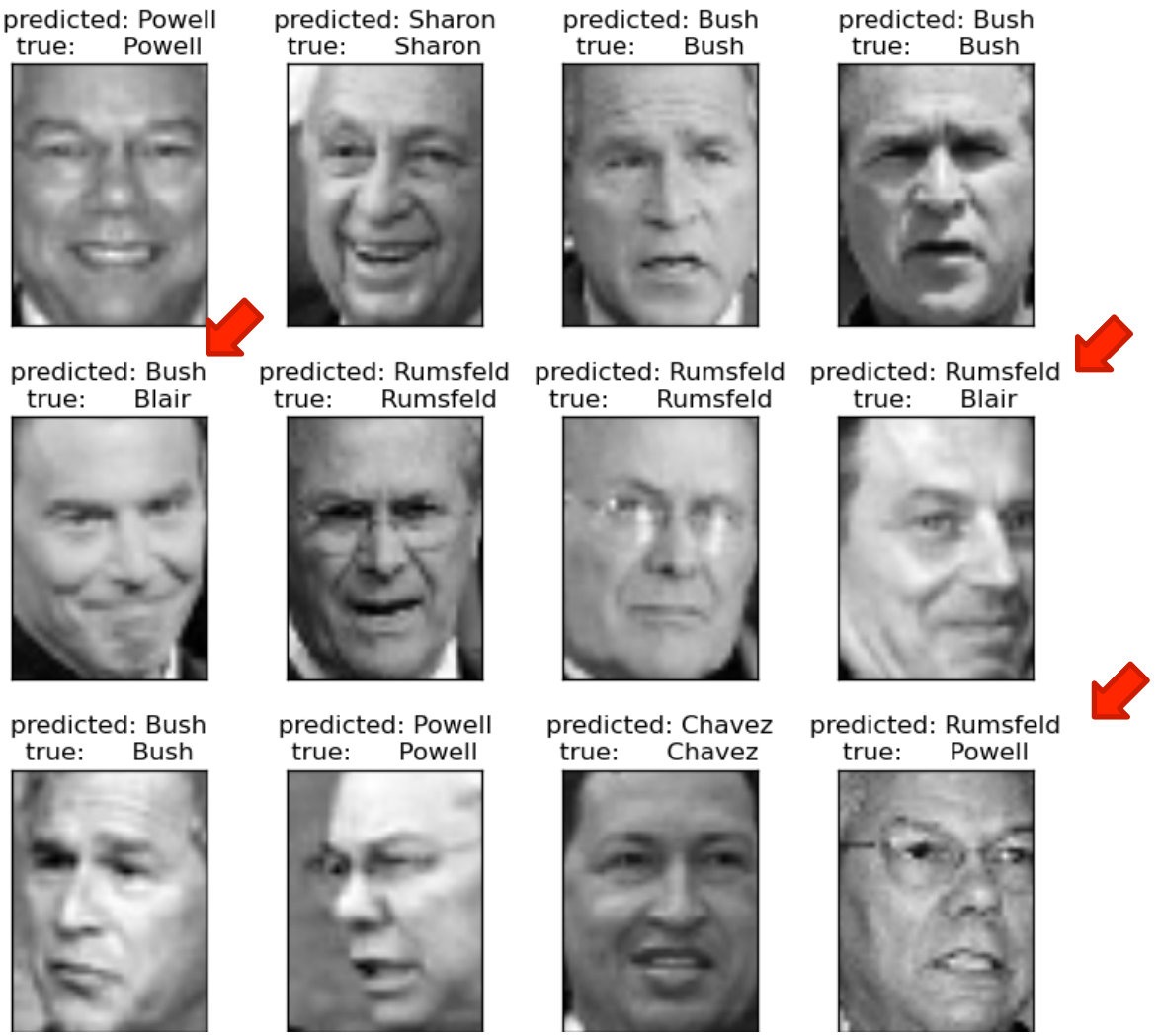
Who is it?

Donald Rumsfeld

Tony Blair

Colin Powell

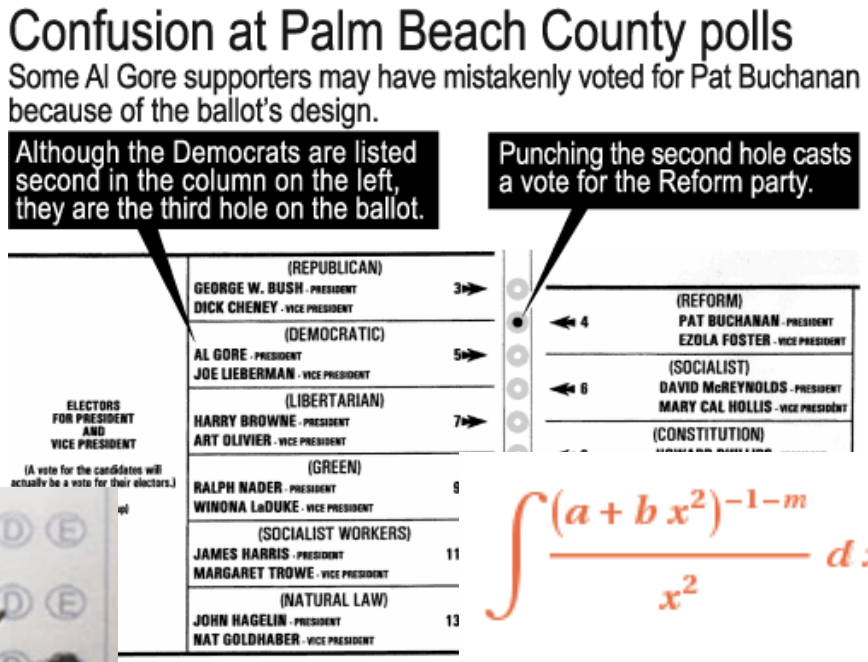
George W. Bush

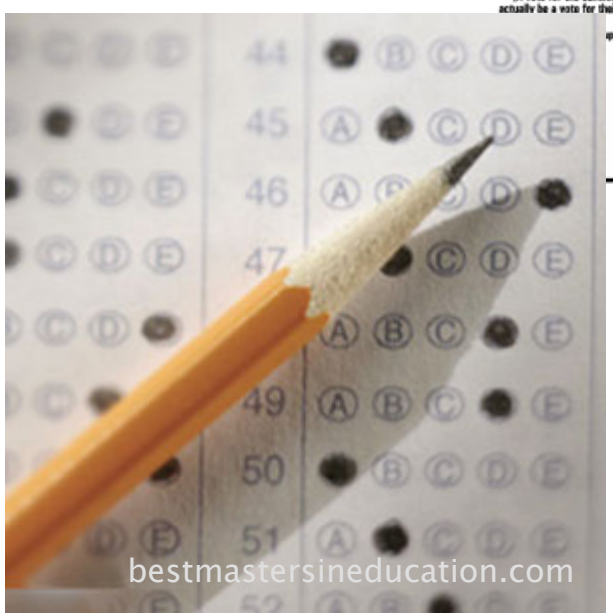


http://scikit-learn.org/0.9/auto_examples/applications/face_recognition.html

Easy for Computers, Hard for Humans

Easy for Computers, Hard for Humans



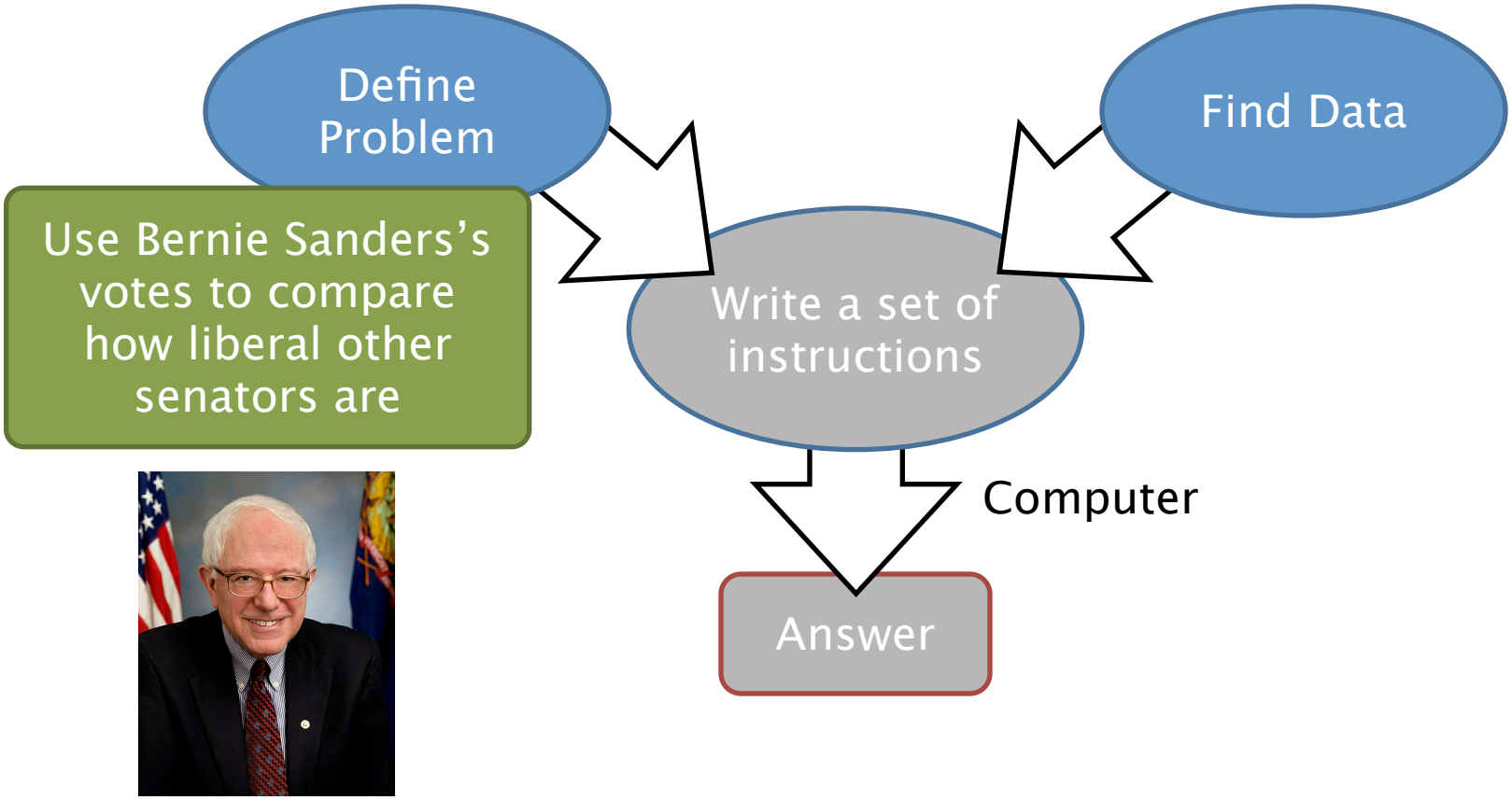


http://www.mit.edu

$$\int \frac{(a+b\,x^2)^{-1-m}}{x^2}\,dx =$$

$$-\frac{1}{a^2\,x}(a+b\,x^2)^{-m}\left(\frac{b\,x^2}{a}+1\right)^m$$
$$\left(b\,x^2\,{}_2F_1\left(\frac{1}{2},\,m+1;\,\frac{3}{2};\,-\frac{b\,x^2}{a}\right)+\right.$$
$$\left.a\,{}_2F_1\left(-\frac{1}{2},\,m;\,\frac{1}{2};\,-\frac{b\,x^2}{a}\right)\right)$$

Today's Class



Finding Data

	Senator	Bill 1	Bill 2	Bill 3	Bill 4	…
★ 	Sanders	Yes	No	Yes	Yes	
	B	No	Yes	No	Yes	
	C	Yes	Yes	Yes	Yes	
	D	Yes	No	Yes	Yes	
	E	No	Yes	No	No	
	…					

Freely accessible and online

Finding Data

	Senator	Bill 1	Bill 2	Bill 3	Bill 4	…
★ 	Sanders	Yes	No	Yes	Yes	
	B	No	Yes	No	Yes	
	C	Yes	Yes	Yes	Yes	
	D	Yes	No	Yes	Yes	
	E	No	Yes	No	No	
	…					

What can we determine from the URL?

How Long Will It Take to Make This Table?

	Senator	Bill 1	Bill 2	Bill 3	Bill 4	…
★ 	Sanders	Yes	No	Yes	Yes	
	B	No	Yes	No	Yes	
	C	Yes	Yes	Yes	Yes	
	D	Yes	No	Yes	Yes	
	E	No	Yes	No	No	
	…					

Write a set of instructions.

How Long Will It Take to Make This Table?

	Senator	Bill 1	Bill 2	Bill 3	Bill 4	…
★ 	Sanders	Yes	No	Yes	Yes	
	B	No	Yes	No	Yes	
	C	Yes	Yes	Yes	Yes	
	D	Yes	No	Yes	Yes	
	E	No	Yes	No	No	
	…					

For Each Bill:

- Navigate to the webpage (using the url trick)
- **For Each** Senator:
  - **Record** their vote

Break

XML: **Ex**tensible **M**arkup **L**anguage
OK for Humans, OK for Computers

First look at the structure

XML: Extensible Markup Language OK for Humans, OK for Computers

```
<?xml version="1.0" encoding="UTF-8" ?>
<roll_call_vote>
      <congress>112</congress>
      <session>2</session>
      …
      <members>
            <member>
            <member_full>Akaka (D-HI)</member_full>
            …
            <vote_cast>Yea</vote_cast>
            …
            </member>
      …
      </members>
  </roll_call_vote>
```

XML: Extensible Markup Language OK for Humans, OK for Computers

```
<?xml version="1.0" encoding="UTF-8" ?>
<roll_call_vote>
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                …
                </member>
        …
        </members>
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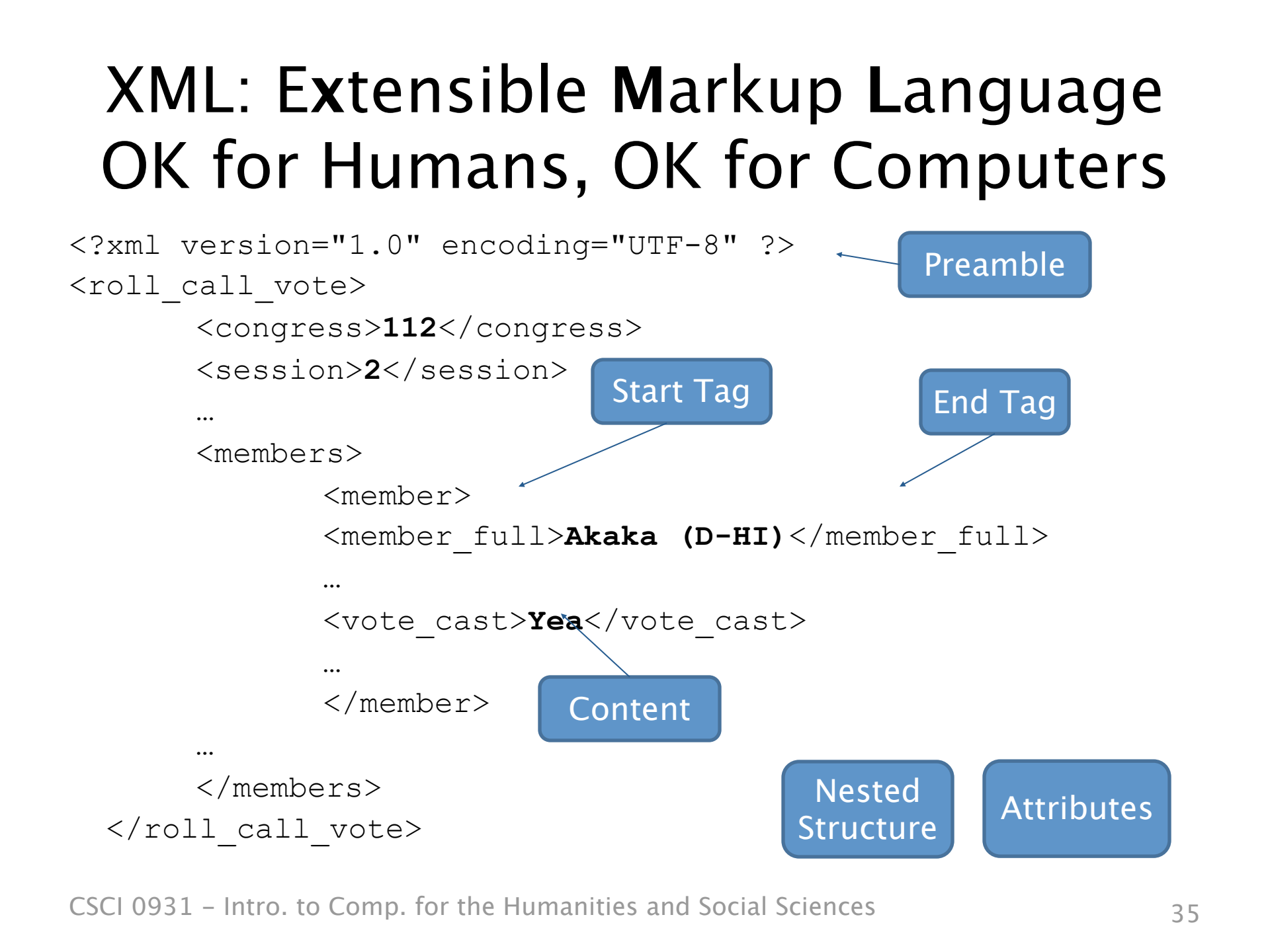


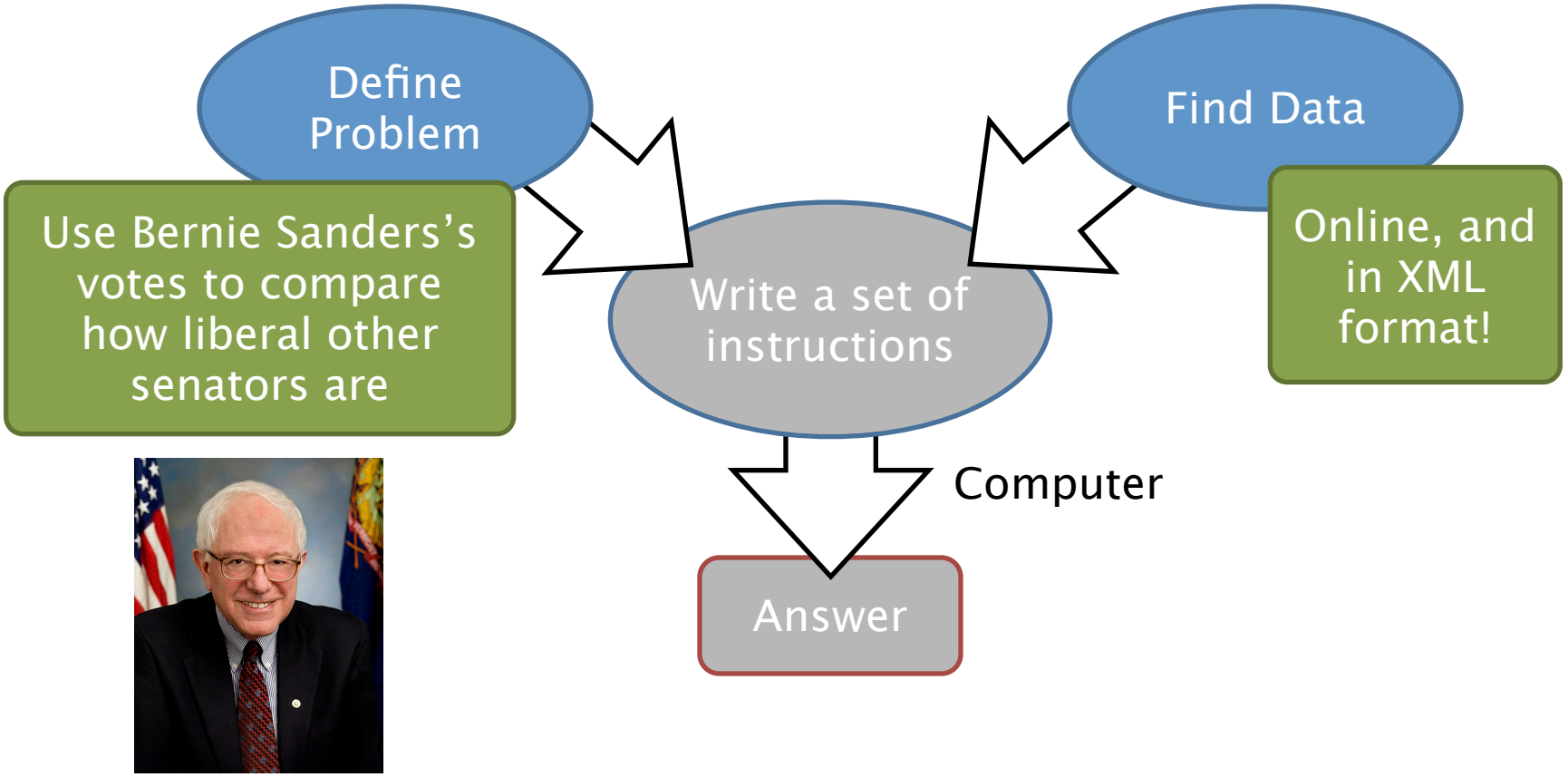
XML in Surprising Places

Why the ‘X’ in .docx? .pptx? .xlsx?

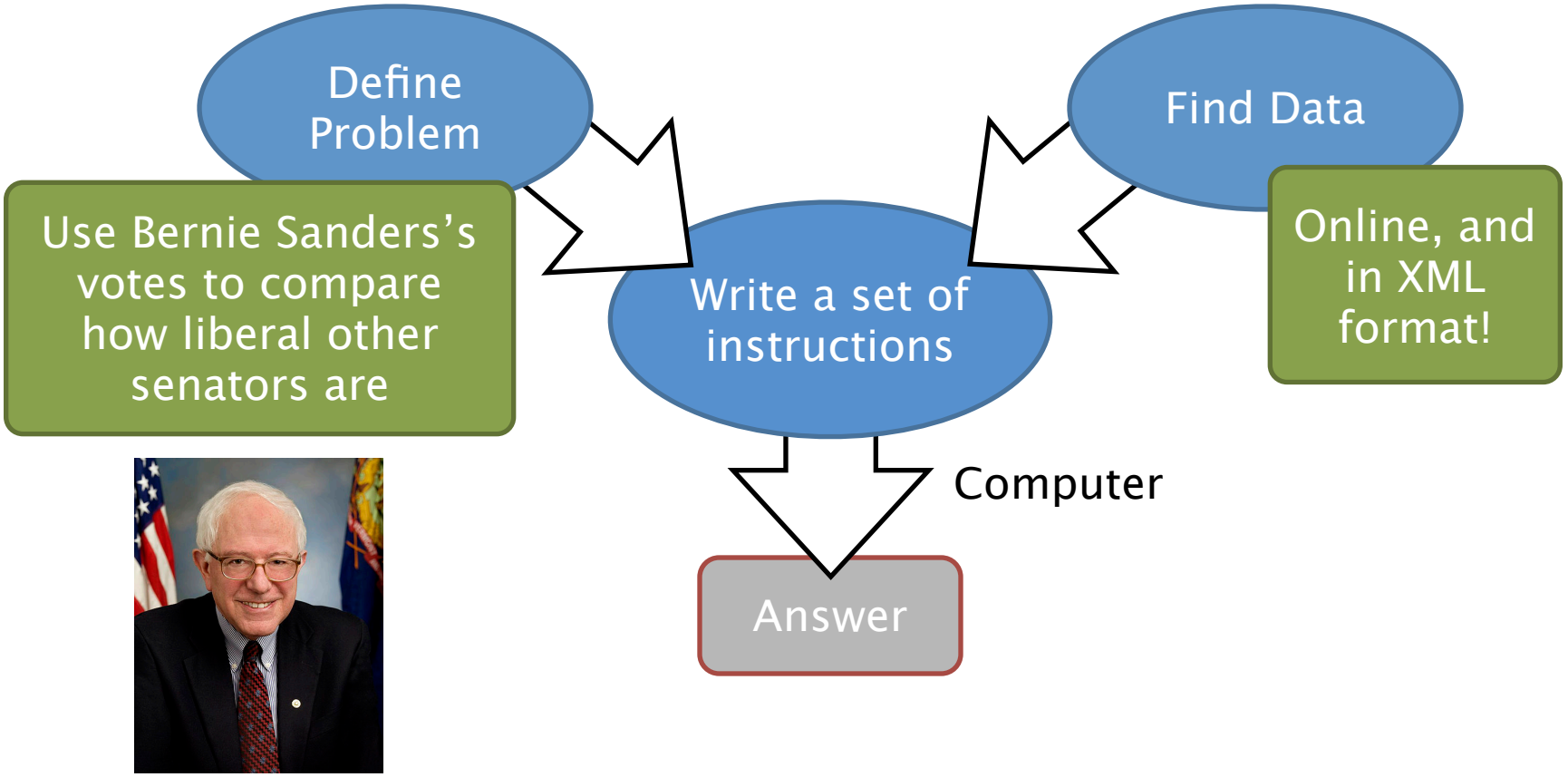
XML in Surprising Places

- Open up Word, write a sentence.
  - Change the color, the style, the font, etc.
- Save the document.
  - It's actually a zipped XML file.
- Change the extension to `name.docx.zip`
- Right click & select "Extract To `name.docx/`"
- Open `word/document.xml` and try to find the sentence you wrote.

Today's Class



Next Time


Define Problem
Find Data
Use Bernie Sanders's votes to compare how liberal other senators are
Write a set of instructions
Online, and in XML format!
Computer
Answer