Ranking Senators with Senator X’s Votes

Sep 24, 2015
What We’ve Accomplished

Use Bernie Sanders’ votes to compare how liberal other senators are

Define Problem

Find Data

Write a set of instructions

Solution

XML Format

CSV Format

Make a HUGE spreadsheet table

Vote on bills only!

CSCI 0931 - Intro. to Comp. for the Humanities and Social Sciences
New Problem

Redefine Problem

Find Data

Modify existing instructions

Solution

Use Senator X’s votes to compare how liberal other senators are

XML Format

CSV Format

Make a HUGE Spreadsheet table

Computer (spreadsheet)

Vote on bills only!

CSCI 0931 - Intro. to Comp. for the Humanities and Social Sciences
In Activity 1-3, you’ll...

- Learn new spreadsheet techniques
- Rank relative to any senator, not just Bernie
- Task 2 will make a nice spreadsheet that can be used by others

- Start by doing Task 1 with a partner...
Reminder about OFFSET

OFFSET: Returns a reference to a range (or cell) that is a specified number of rows and columns from a base range (or cell).

OFFSET(reference, rows, cols)

• Go ahead and start on Part 1.
Let’s do Task 1
After task 1

• Any questions?
• Move on to Task 2: making a spreadsheet that shows comparison results vs ANY senator, not just Sanders.
Activity 1-3

• Task 2
  – We broke this task down into manageable pieces.
  – Nice formatting is useful
  – This spreadsheet is now useful for other people
  – It’s a generalization of the Sanders spreadsheet, and took almost no time to create!
    • If you’d done the Sanders work by hand, redoing it for a new senator would have taken just as long
Rankings

• Who is least like Bernie?
• What are the rankings relative to that person?
• How do they compare to the Bernie rankings?
  – Rank Bernie on your screen; get a friend to reverse-rank vs Bernie’s nemesis. Compare.
Discussion

• Is ranking relative to Sanders (or Coburn) really a measurement of liberalness? If so, why don’t they give exact opposite results?
• What if we had used Warren, or some other very liberal senator, instead of Sanders? Same results? Shuffled?
• Let’s look at all possible orderings!
So Far

• What have we accomplished?
  – ACT1-1:
    • Imported voting data from the web
    • Filtered out rows and columns that aren’t needed
    • Converted “Yea”, “Nay”, “Not Voting/Present” into numbers using nested IF statements
    • Made a pivot table to summarize these numbers
So Far

• What have we accomplished?
  – ACT1-2:
    • Made a new sheet that converts numbers representing *individual votes* into numbers that represent agreement with Bernie Sanders on each vote
    • **Absolute addressing** (using the $) was important when we wrote formulas that depended on specific rows
    • Computed a similarity/distance score between each senator and Bernie – we called it **rank**, and it could range from -1 to 1
So Far

• What have we accomplished?
  – ACT1-3:
    • Made a new sheet that converts numbers representing individual votes into numbers that represent agreement with a selected senator on each vote
    • The sheet is interactive; it uses data validation to make sure inputs like senator names exist in the table
    • Healthy use of MATCH and OFFSET to take the chosen senator name and find the corresponding data in the other sheets
Next Class

• What if we want to look at how all senators rank compared to all others?
Next Class

Redefine Problem

Find Data

Modify existing instructions

Solution

Vote on bills only!

Rank all senators according to all others

Modify existing instructions

Computer (Excel)

Make a HUGE Excel table

Find Data

XML Format

CSV Format

Vote on bills only!

Redefine Problem

Find Data

Make a HUGE Excel table

CSV Format

XML Format
## Compare Every Pair in One Table

### What We Have:

<table>
<thead>
<tr>
<th></th>
<th>1:101</th>
<th>1:115</th>
<th>1:129</th>
<th>1:138</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akaka</td>
<td>Yea</td>
<td>Yea</td>
<td>Yea</td>
<td>Yea</td>
</tr>
<tr>
<td>Alexander</td>
<td>Yea</td>
<td>Yea</td>
<td>Yea</td>
<td>Yea</td>
</tr>
<tr>
<td>Ayotte</td>
<td>Nay</td>
<td>Yea</td>
<td>Yea</td>
<td>Yea</td>
</tr>
<tr>
<td>Barrasso</td>
<td>Yea</td>
<td>Yea</td>
<td>Yea</td>
<td>Yea</td>
</tr>
</tbody>
</table>

### What We Want:

<table>
<thead>
<tr>
<th></th>
<th>Akaka</th>
<th>Alexander</th>
<th>Ayotte</th>
<th>Barrasso</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akaka</td>
<td>1</td>
<td>0.314285714</td>
<td>0.085714286</td>
<td>0.117647059</td>
</tr>
<tr>
<td>Alexander</td>
<td>0.314285714</td>
<td>1</td>
<td>0.657142857</td>
<td>0.647058824</td>
</tr>
<tr>
<td>Ayotte</td>
<td>0.085714286</td>
<td>0.657142857</td>
<td>1</td>
<td>0.764705882</td>
</tr>
<tr>
<td>Barrasso</td>
<td>0.117647059</td>
<td>0.647058824</td>
<td>0.764705882</td>
<td>1</td>
</tr>
</tbody>
</table>
Next Class

• ACT1-4: Arrays
  – Write formulas where the output is in multiple cells (e.g., *transpose* a row into a column)

\[
\begin{array}{c}
1 \\
2 \\
3 \\
\end{array}
\quad \leftrightarrow \quad 
\begin{array}{c}
1 \\
2 \\
3 \\
\end{array}
\]

– We’ll see how these formulas can help us compute lots of things at once
Next time

• Build that similarity table
• Following HW, we’ll be able to build it with a much simpler method
• How can we make sense of the 10,000 items in it?