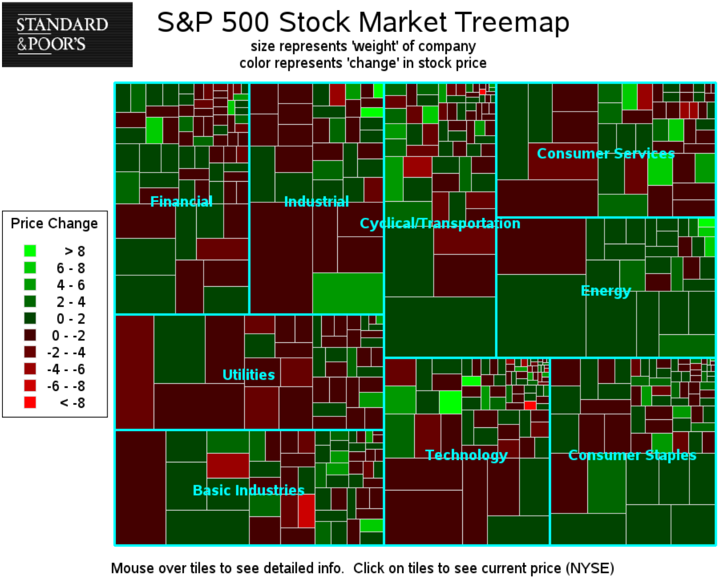
Lecture 15: Treemaps

Stock Market Viz



STANDARD & POOR'S

S&P 500 Stock Market Treemap

size represents 'weight' of company
color represents 'change' in stock price

Price Change

🟩 > 8
🟩 6 - 8
🟩 4 - 6
🟩 2 - 4
🟩 0 - 2
🟥 0 - -2
🟥 -2 - -4
🟥 -4 - -6
🟥 -6 - -8
🟥 < -8

Mouse over tiles to see detailed info. Click on tiles to see current price (NYSE)

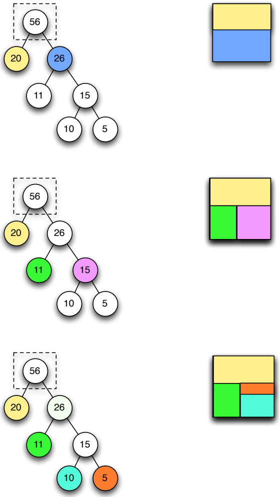
Building Treemaps with a Greedy Algorithm

Algorithm 1 BuildTreeMap(*data*)

Require: A list of n data items. For simplicity, we assume each item is a weight, but it might be a more complex object in reality.

```
$T \leftarrow$ a list of $n$ trees ($T = T_1 \dots T_n$)
Sort $T$ from highest weight to lowest weight
while $|T| > 1$ do
    $Z_1 \leftarrow$ the last tree in $T$
    $Z_2 \leftarrow$ the second-to-last tree in $T$
    $Z \leftarrow \text{Tree}(\mathit{weight}(Z_1) + \mathit{weight}(Z_2), Z_1, Z_2)$
    Replace $Z_1$ and $Z_2$ with $Z$ in $T$.
    Sort $T$ form highest weight to lowest weight
end while
return The final tree in $T$
```

From Trees to Treemaps



A recursive procedure for generating rectangles

leaf If the t is a leaf, then return the the list containing r; and

non-leaf if t is not a leaf, then

1. split r into two smaller rectangles r_1 and r_2 along the axis given by o using weight proportional to the left and right subtrees respectively;
2. recursively find the partition of r_1 by making a recursive call on the left subtree, passing r_1 and the opposite orientation of o;
3. recursively find the partition of r_2 by making a recursive call on the right subtree, passing r_2 and the opposite orientation of o;
4. return the concatenation of these two partitions.