

Computation and Visualization for Analytics

Spring 2021

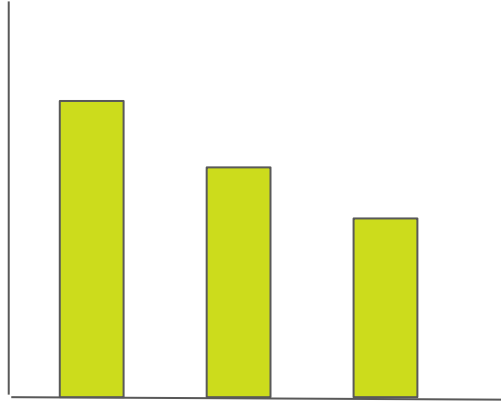
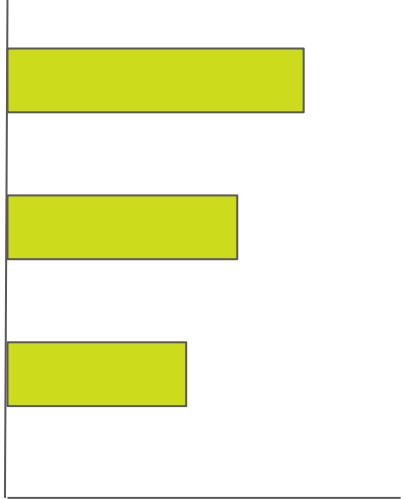
Week 5.1

Visualizing Amounts

- Comparison
- Composition

Bar Graphs

Numerical variable

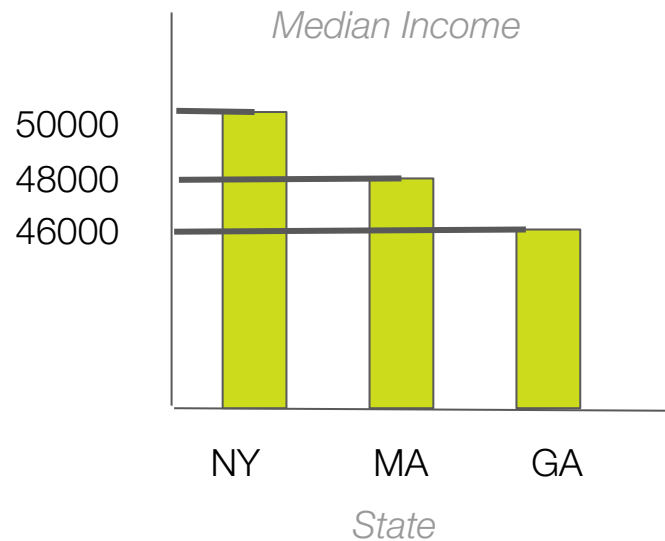
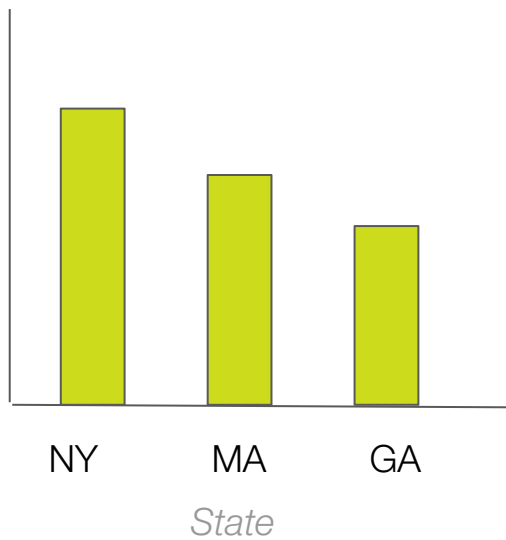


Categorical variable

Use

- Comparison
- Communicating values

Bar Graphs



Bar Graph Rules

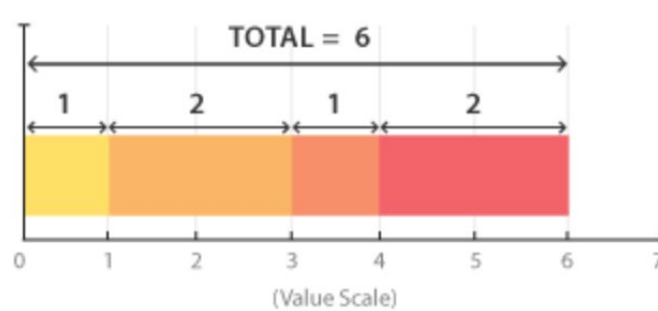
- Always start the numerical axis from zero
- Avoid using categorical variables with too many factors
- Include variable description on the axis or as a title
- Avoid channels (*saturation*, and *bar width*) to show differences

Channel Optimization for Bar Graphs (preattentive memory)

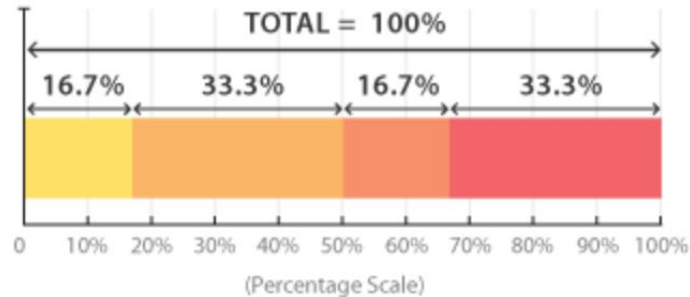
- Highlights
- Sort
- Text annotation (labels)
- Aggregate statistics

Stacked Bar Graphs

Simple



100%



Use

- Comparison
- Communicating values

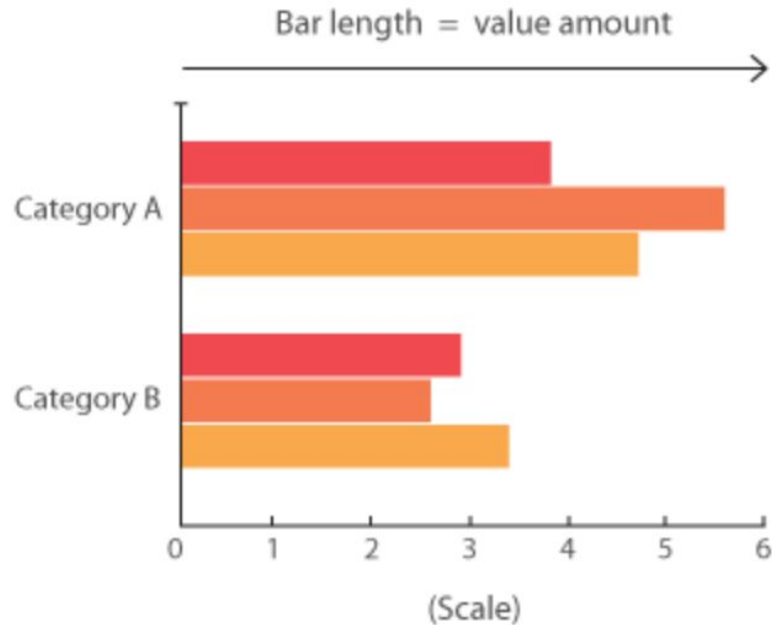
Stacked Bar Graph Rules

- Always start the numerical axis from zero
- Avoid using categorical variables with too many factors
- Include variable description on the axis or as a title
- Avoid channels (*saturation*, and *bar width*) to show differences

Channel Optimization for Stacked Bar Graphs (preattentive memory)

- Text annotation (labels)
- Scale differences must be addressed

Grouped Bar Graphs



Use

- Comparison
- Communicating values

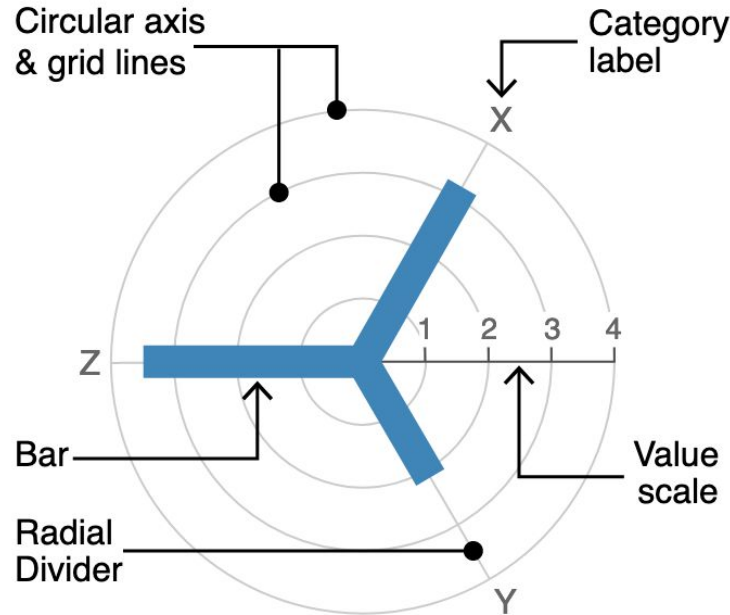
Grouped Bar Graph Rules

- Always start the numerical axis from zero
- Avoid using categorical variables with too many factors
- Include variable description on the axis or as a title
- Avoid channels (*saturation*, and *bar width*) to show differences

Channel Optimization for Grouped Bar Graphs (preattentive memory)

- Text annotation (labels)
- Scale differences must be addressed

Radial Column Chart/ Radar Graph



Use

- Comparison
- Communicating values

Radial Column Chart Rules

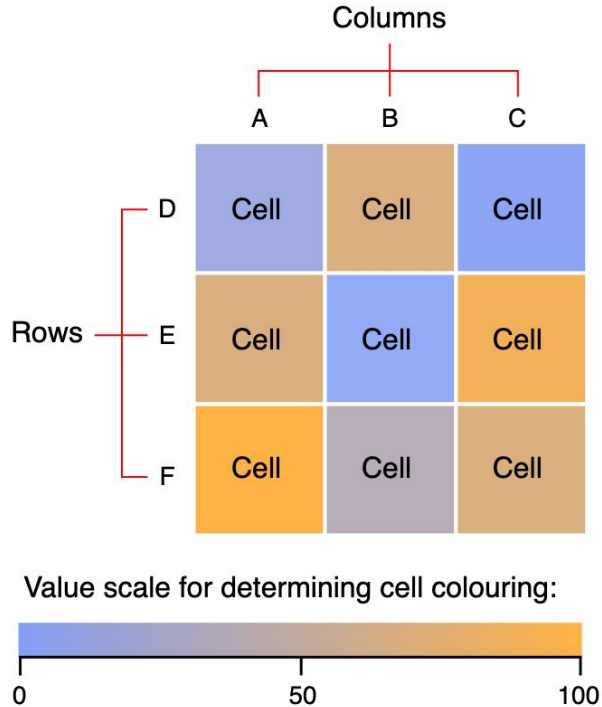
- Always start the numerical axis from zero
- Avoid channels (*saturation*, and *bar width*) to show differences

Channel Optimization for Radial Column Chart (preattentive memory)

- Text annotation (labels)
- Scale differences must be addressed

HeatMap

Heatmap using numerical data:

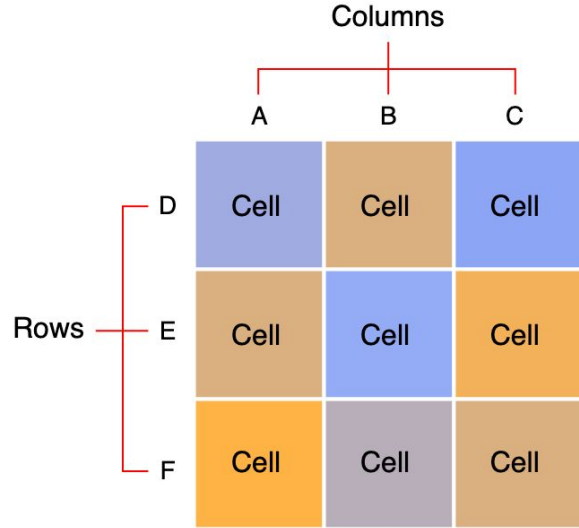


Use

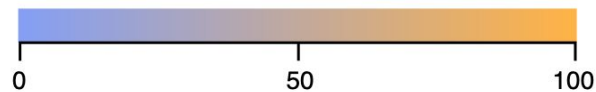
■ Comparison

HeatMap

Heatmap using numerical data:



Value scale for determining cell colouring:



Alternative value scale broken into ranges:

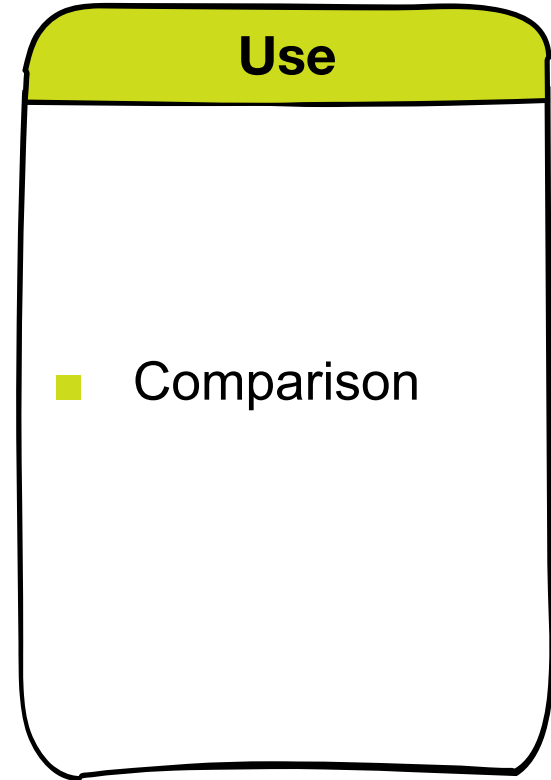
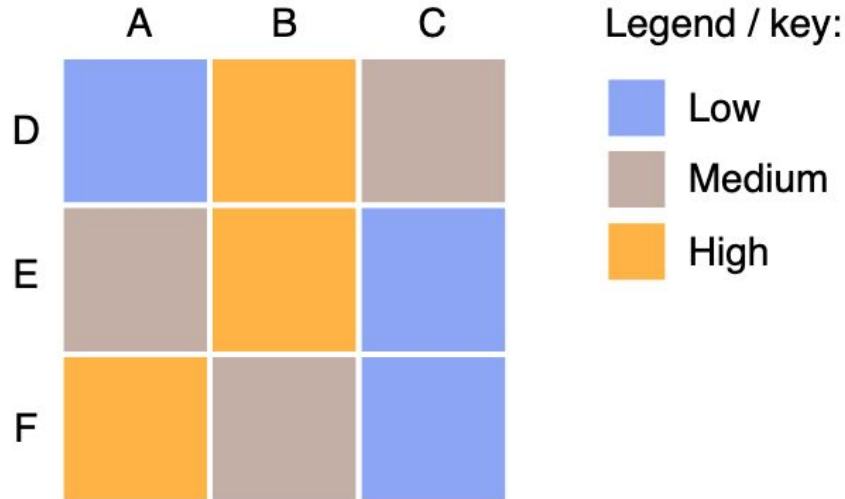


Use

■ Comparison

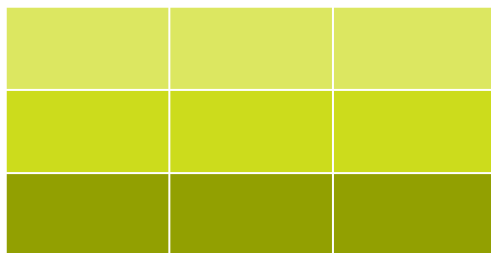
HeatMap

Heatmap using categorical data:

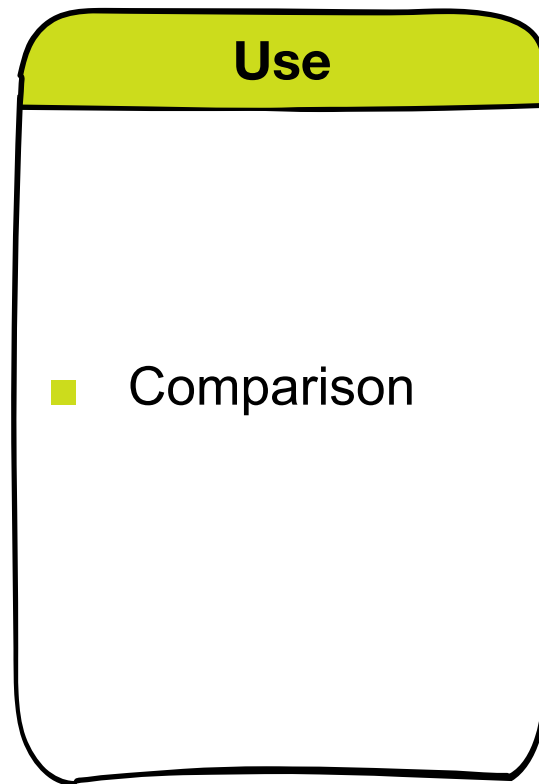


HeatMap

Categorical variable



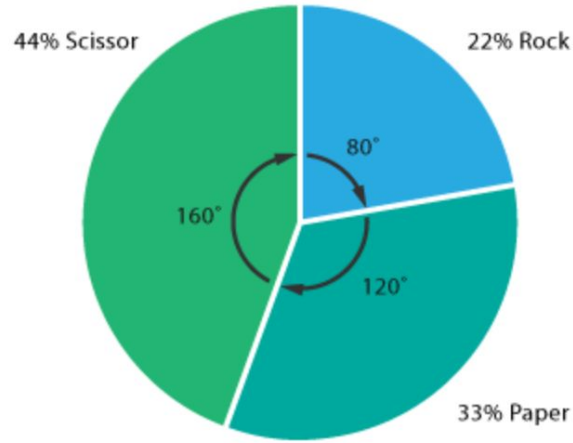
Categorical variable



Channel Optimization (preattentive memory)

- Sort

Pie Chart



Data			
Rock	Paper	Scissor	TOTAL
2	3	4	9
To calculate percentages			
$2/9=22\%$	$3/9=33\%$	$4/9=44\%$	100%
Degrees for each "pie slice"			
$(2/9) \times 360 = 80^\circ$	$(3/9) \times 360 = 120^\circ$	$(4/9) \times 360 = 160^\circ$	360°

Use

- Composition
- Part-to-whole

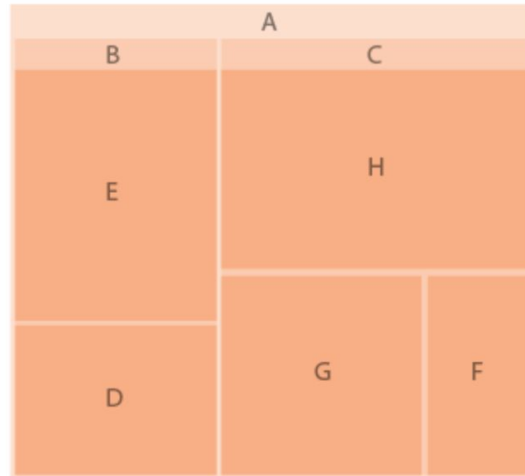
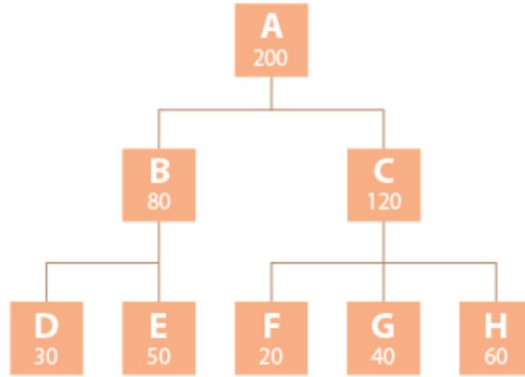
Pie Rules

- Avoid using variables with too many factors
- Avoid channel (*saturation*) to show differences
- Avoid using multiple pie charts for comparison

Channel Optimization for Pie Charts (preattentive memory)

- Text annotation (labels)
- Calculate percentages
- Scale differences must be addressed

Tree Map



Use

- Composition with hierarchy
- Part-to-whole

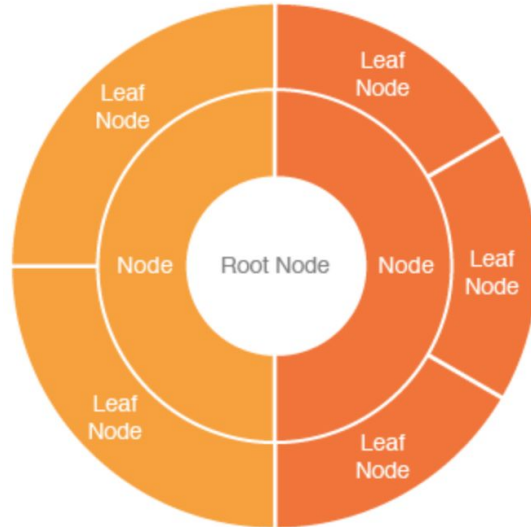
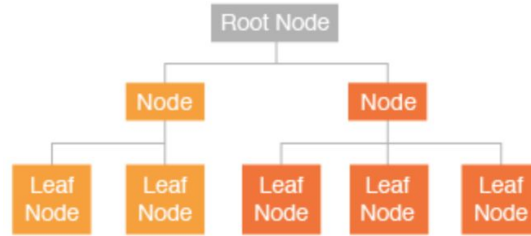
Tree Map Rules

- Avoid using variables with too many factors
- Avoid channel (*saturation*) to show differences

Channel Optimization for Tree Maps (preattentive memory)

- Scale differences must be addressed

Sunburst Diagram



Use

- Composition with hierarchy
- Part-to-whole

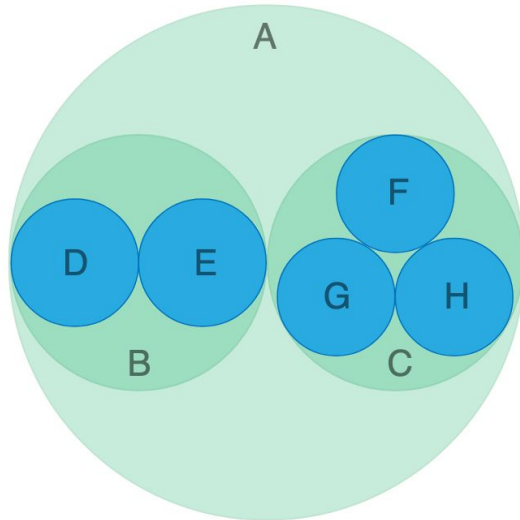
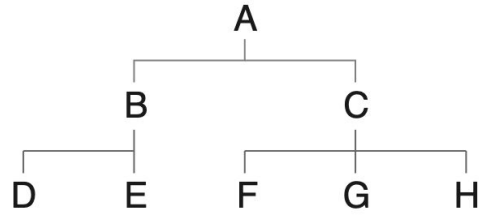
Sunburst Rules

- Avoid using variables with too many factors

Channel Optimization for Sunburst Diagram (preattentive memory)

- Scale differences must be addressed

Packed Circle



Use

- Composition with hierarchy
- Part-to-whole

Packed Circle Rules

- Avoid using variables with too many factors

Channel Optimization for Packed Circles (preattentive memory)

- Scale differences must be addressed