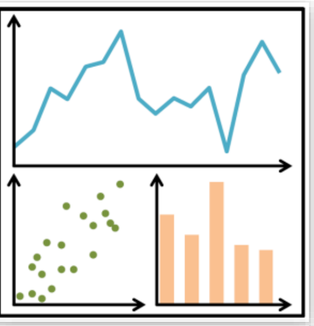
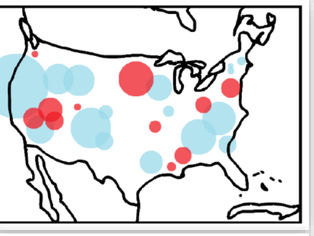
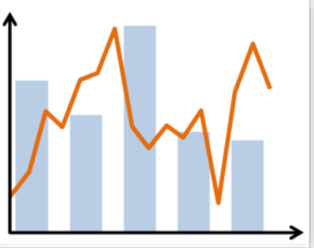
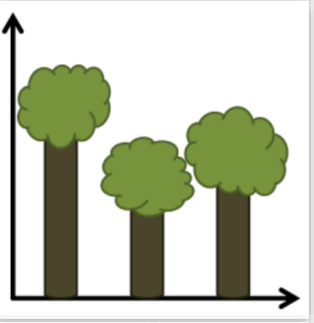
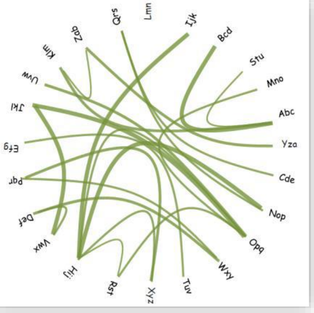






Lecture 13: Interaction, Animation, Continued…

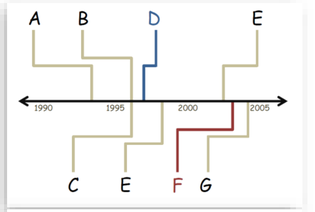
CS 7250

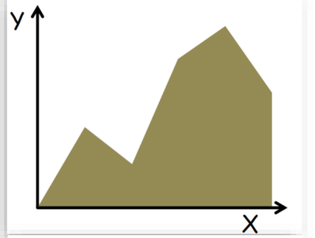
SPRING 2021

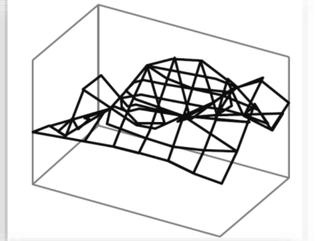
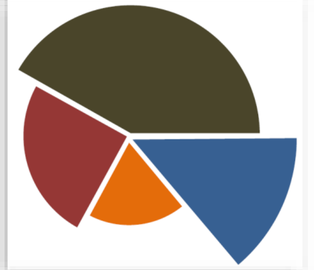
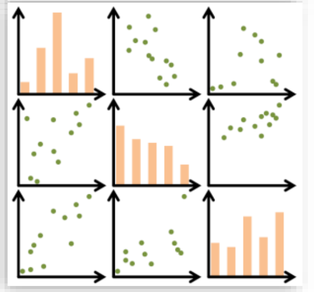
Prof. Cody Dunne

NORTHEASTERN UNIVERSITY

Slides and inspiration from Michelle Borkin, Krzysztof Gajos, Hanspeter Pfister, Miriah Meyer, Jonathan Schwabish, and David Sprague





Checking In

The Importance of Proofreading

Previously, on CS 7250…

“Overview first, zoom and filter, and details on demand.”

- Ben Shneiderman

“The Shneiderman Mantra”

Shneiderman, 1996

“Search, show context, expand on demand”

- van Ham & Perer

How?

Encode

Arrange

- Express
- Separate
- Order
- Align
- Use

Map

from categorical and ordered attributes

- Color
  - *Hue*
  - *Saturation*
  - *Luminance*
- Size, Angle, Curvature, ...
- Shape
- Motion

Direction, Rate, Frequency, ...

Manipulate

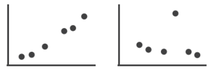
Change

Select

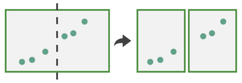
Navigate

Facet

Juxtapose



Partition



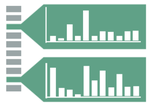
Superimpose

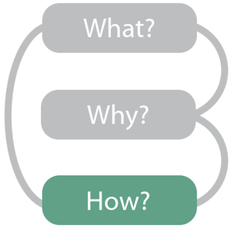
Reduce

Filter

Aggregate

Embed

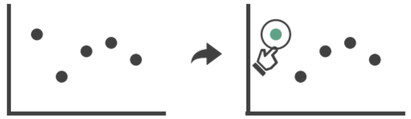




Manipulate

Change over Time

Select



Navigate

→ Item Reduction

→ *Zoom*
Geometric or *Semantic*

→ *Pan/Translate*

→ *Constrained*

→ Attribute Reduction

→ *Slice*

→ *Cut*

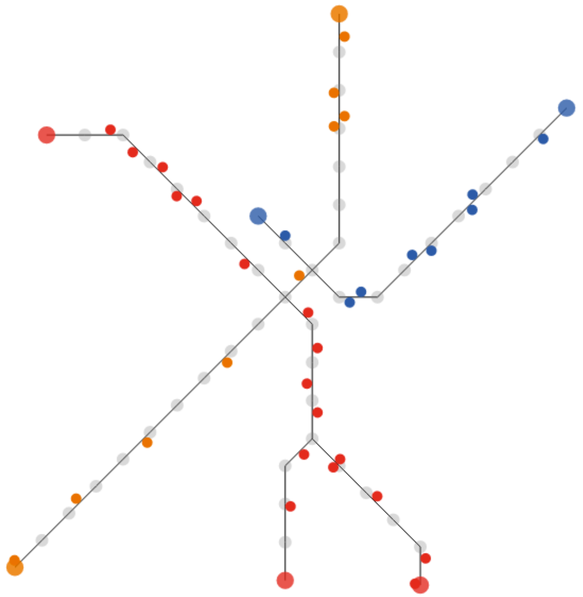
→ *Project*

Now, on CS 7250…

INTERACTION & ANIMATION

IN-CLASS EXERCISE

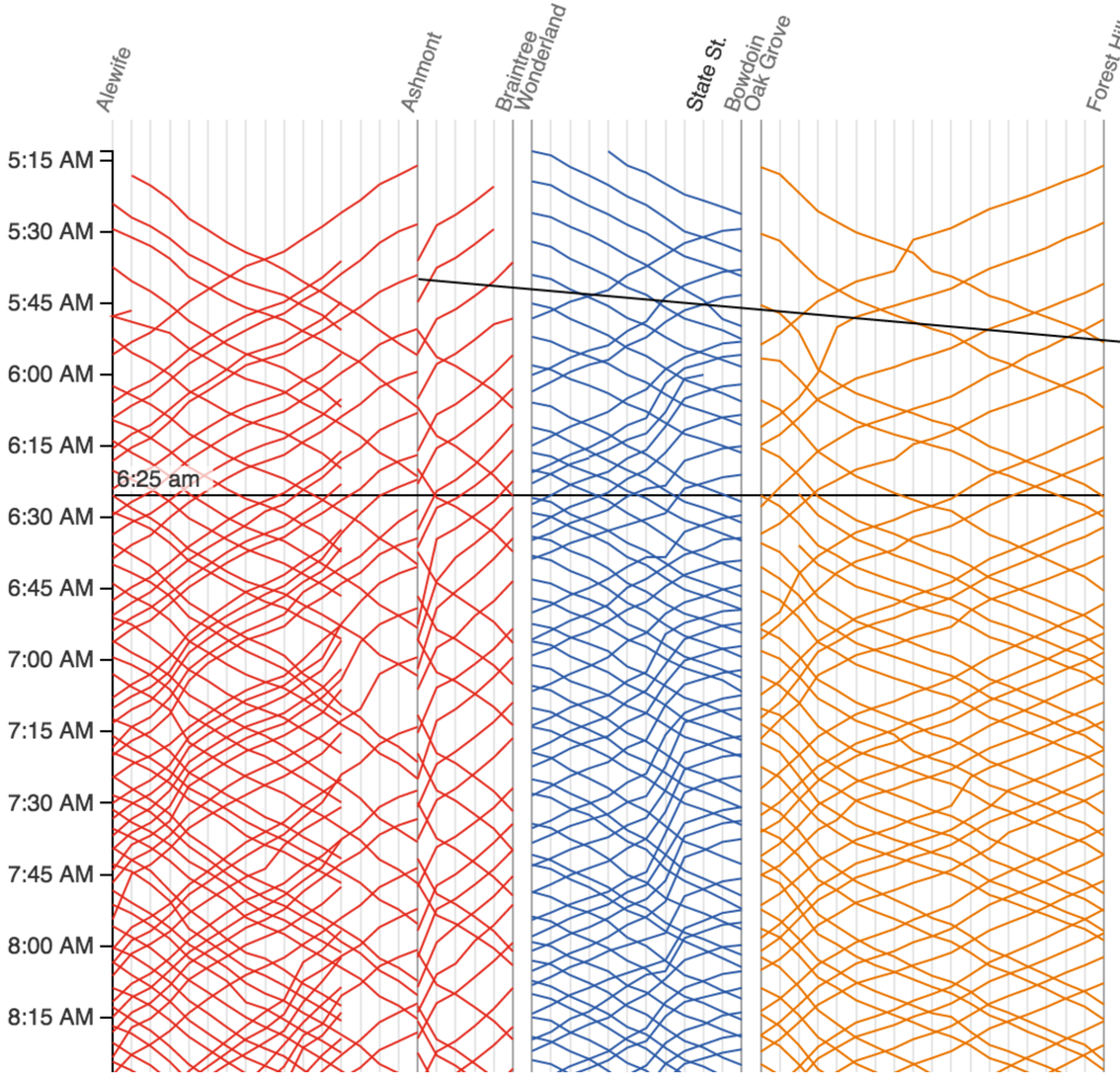
MBTAVis: Excellent WPI course final project



Locations of each train on the red, blue, and orange lines at 6:25 am. Hover over the diagram to the right to display trains at a different time.

Trains are on the right side of the track relative to the direction they are moving.

See the morning rush-hour, midday lull, afternoon rush-hour, and the evening lull.



Service starts at 5AM on Monday morning. Each line represents the path of one train. Time continues downward, so steeper lines indicate slower trains.

Since the red line splits, we show the Ashmont branch first then the Braintree branch. Trains on the Braintree branch "jump over" the Ashmont branch.

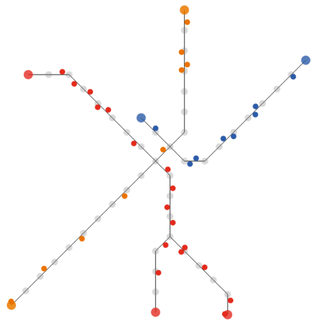
Train frequency increases around 6:30AM as morning rush hour begins.

Barry & Card, 2014

In-Class Critique — MBTAVis

25m

In-Class Critique — MBTAVis



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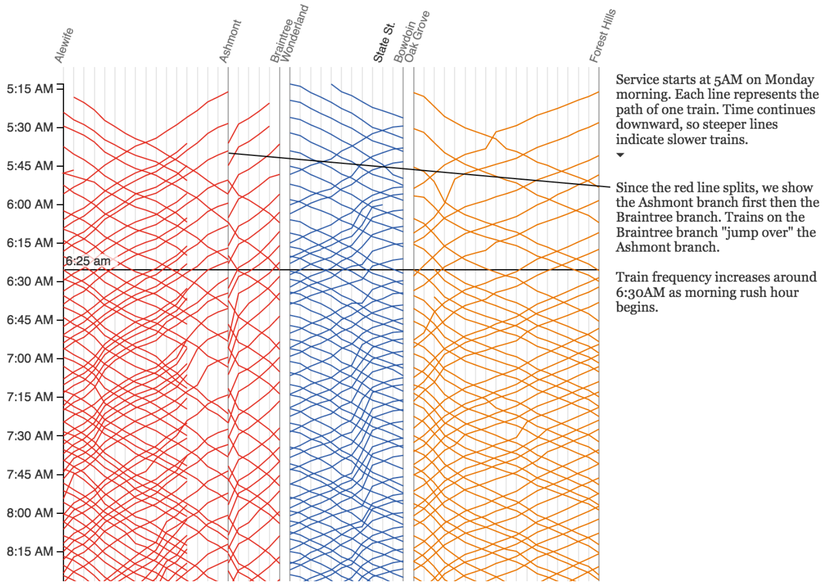

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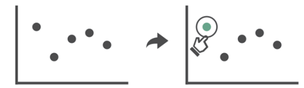
Train frequency increases around 6:30AM as morning rush hour begins.

Manipulate

- **Change over Time**

- **Select**



- **Navigate**
  - → Item Reduction
    - → *Zoom*
      Geometric or *Semantic*

    - → *Pan/Translate*

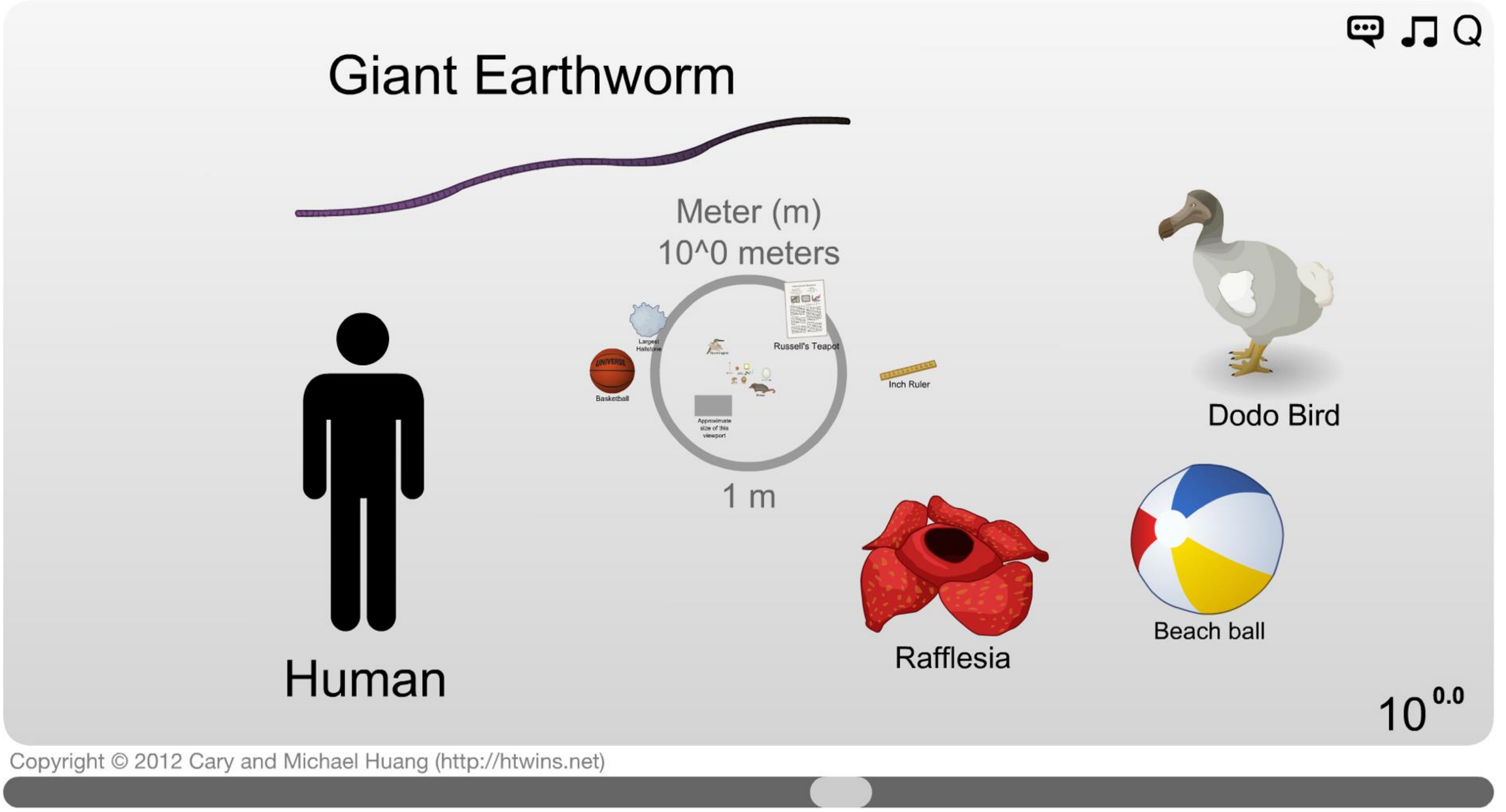
    - → *Constrained*

  - → Attribute Reduction
    - → *Slice*

    - → *Cut*

    - → *Project*

Eames Office, 1977



Copyright © 2012 Cary and Michael Huang (http://htwins.net)

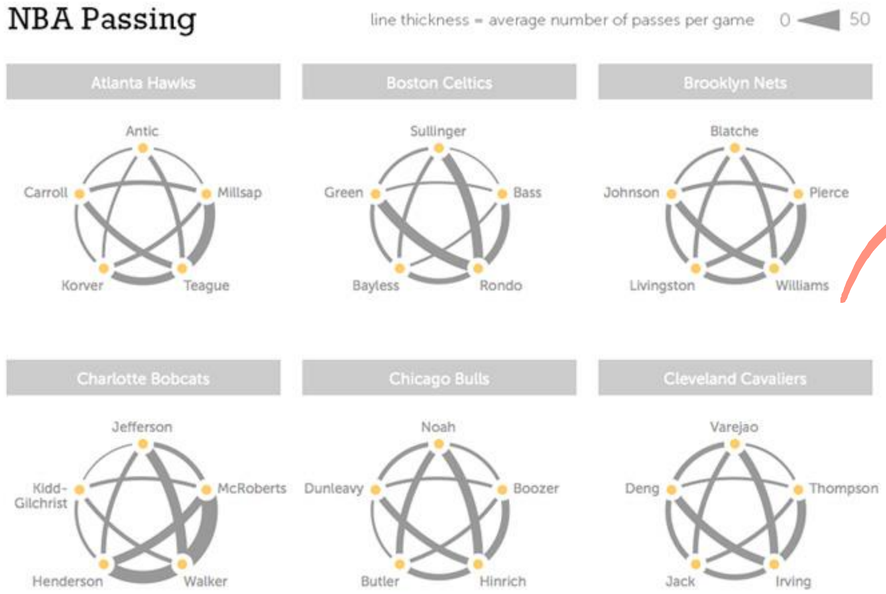
IN-CLASS EXERCISE

NBA Passing

line thickness = average number of passes per game 0 50

In-Class Design — Interactive/Animated NBA Passing

38m



Actions

Analyze

→ Consume

→ *Discover* → *Present* → *Enjoy*

→ Produce

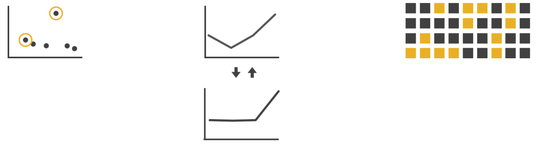
→ *Annotate* → *Record* → *Derive*

Search

	Target known	Target unknown
Location known	*Lookup*	*Browse*
Location unknown	*Locate*	*Explore*

Query

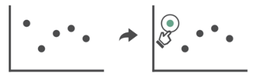
→ Identify → Compare → Summarize



Manipulate

Change over Time

Select



Navigate

→ Item Reduction

→ *Zoom*
Geometric or *Semantic*

→ *Pan/Translate*

→ *Constrained*

→ Attribute Reduction

→ *Slice*

→ *Cut*

→ *Project*

Upcoming Assignments & Communication

Look at the upcoming assignments and deadlines regularly!

- Textbook, Readings, & Reading Quizzes — Variable days
- In-Class Activities — 11:59pm same day as class
  T: Lecture, F: Lecture
- Assignments & Projects— Generally due R 11:59pm
  R (6 days):
  Assignment 8 — Brushing and Linking in D3
  Project 5 — Final "Interactive" Visualization Sketch, Implementation Plan, & Group Charter

Use Canvas Discussions for general questions, email the TAs/S-LTA/instructor for questions specific to you: codydunne-and-tas@ccs.neu.edu. Include links!

If you're emailing about a particular assignment, please **include the URL of the Submission Details page**. (Canvas documentation.)

If you have a project question, **give us your group number**. E.g., include: `Group ## — Topic` with '##' replaced by your group number and 'Topic' replaced by your topic.