Task Abstraction

Why a Vis tool is being used

Actions of Vis Tools

- Consume or produce information
- Actions:
  - To present, to discover, to enjoy
  - To generate or verify a hypothesis
  - To search: either the identify or the location of the target
  - To identify one object, compare some objects, summarize all objects
  - To find trends or outliers; the minimum or maximum values; the distribution of values; the dependencies , correlations, or similarities; the topology of a network or a path; the shape of the data

Three Levels of Actions

Analyze Search Query

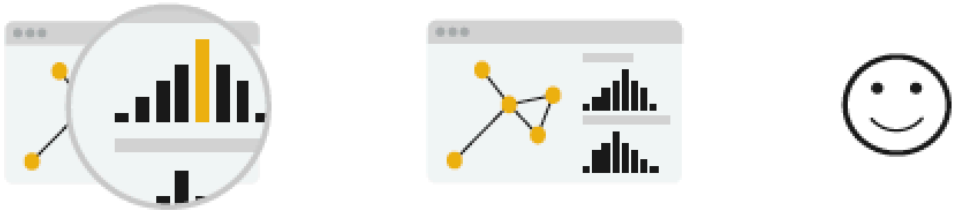
Three Levels of Actions

Analyze

Search

Query

- Consume
  - *Discover*
  - *Present*
  - *Enjoy*



- Produce
  - *Annotate*
  - *Record*
  - *Derive*

Three Levels of Actions

Analyze | **Search** | Query

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

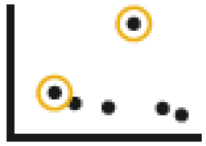
Three Levels of Actions

Analyze

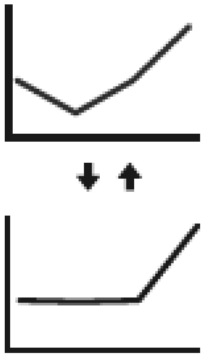
Search

Query

→ Identify



→ Compare

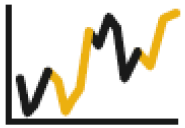


→ Summarize

What are the targets?

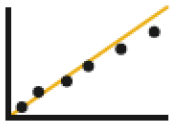
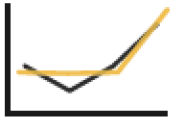
- **All Data**
  - Trends

  - Outliers

  - Features
    
- **Attributes**
  - One
    - *Distribution*

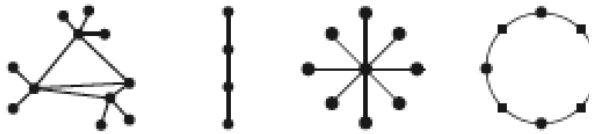
    - *Extremes*

  - Many
    - *Dependency*

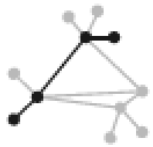
    - *Correlation*
      
    - *Similarity*
      

What are the targets?

- **Network Data**
  - Topology



  - *Paths*



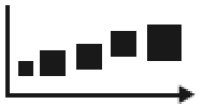
- **Spatial Data**
  - Shape

How? The Choice of Vis Idioms

Encode

- **Arrange**
  - Express

  - Separate

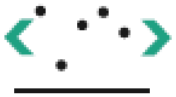
  - Order
    
  - Align

  - Use

Manipulate

- **Change**

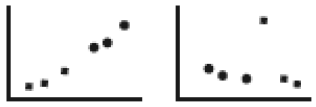
- **Select**

- **Navigate**
  

How? The Choice of Vis Idioms

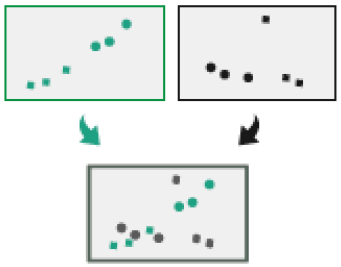
Facet

- Juxtapose



- Partition

- Superimpose



Reduce

- Filter

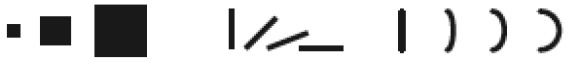
- Aggregate

- Embed

How? The Choice of Vis Idioms

- **Map**
  from categorical and ordered attributes
  - Color
    - *Hue*
    - *Saturation*
    - *Luminance*

  - Size, Angle, Curvature, ...



  - Shape

  - Motion
    Direction, Rate, Frequency, ...