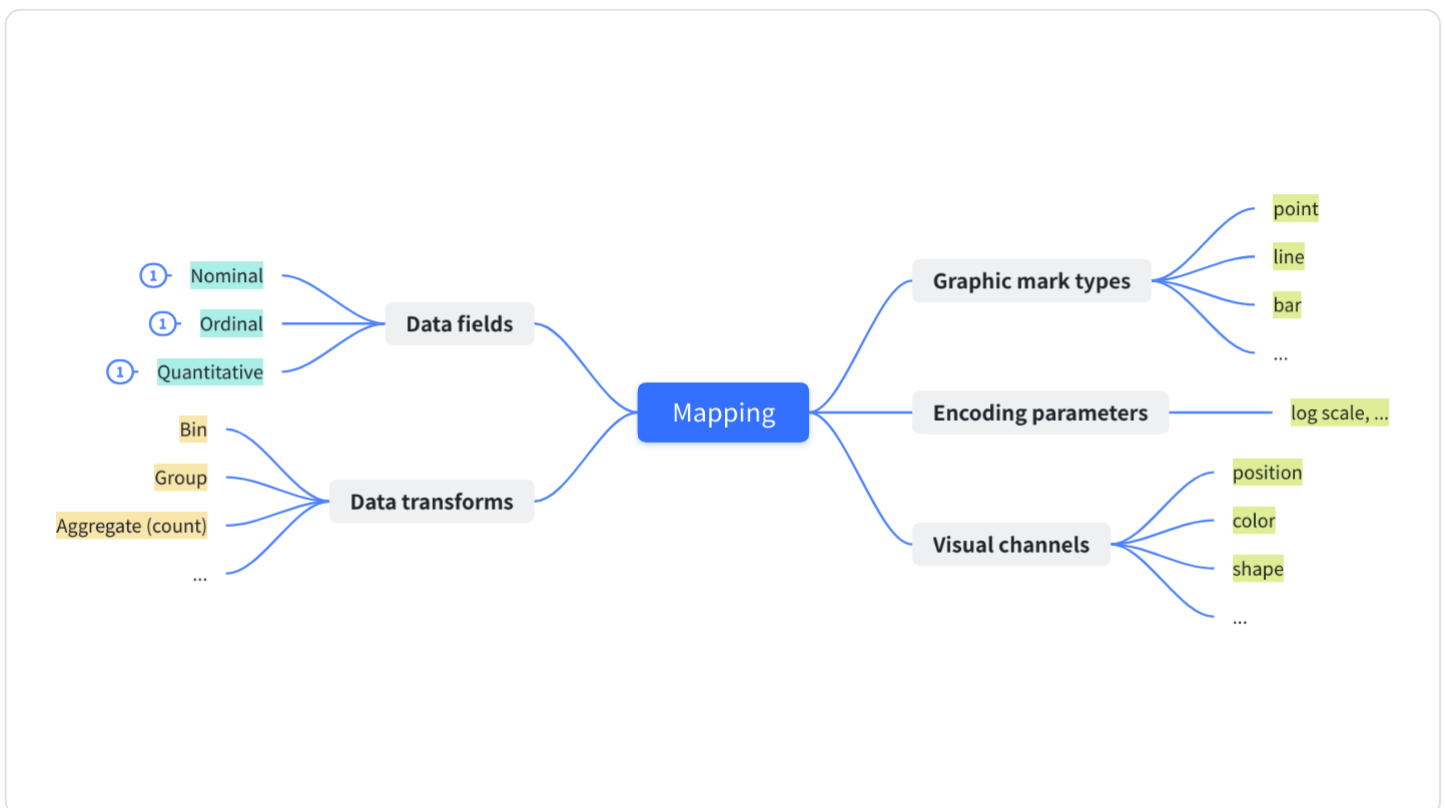


2024 Fall DS363 Visual Encoding Design

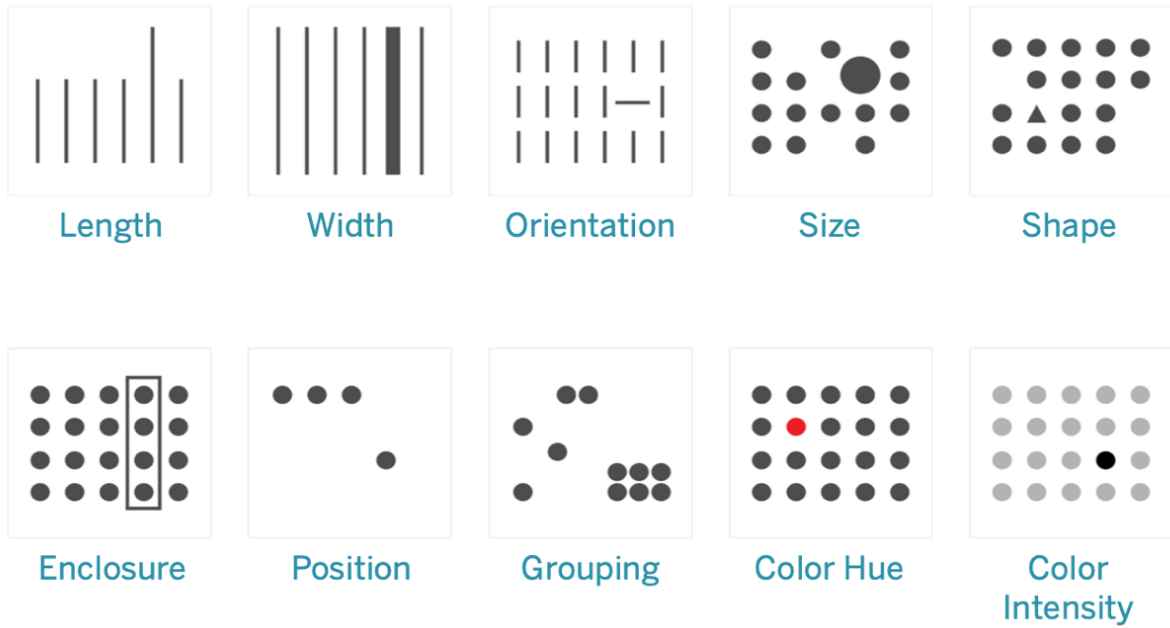
1. The design space of visual encoding

1.1 Mapping Data to Visual Variables

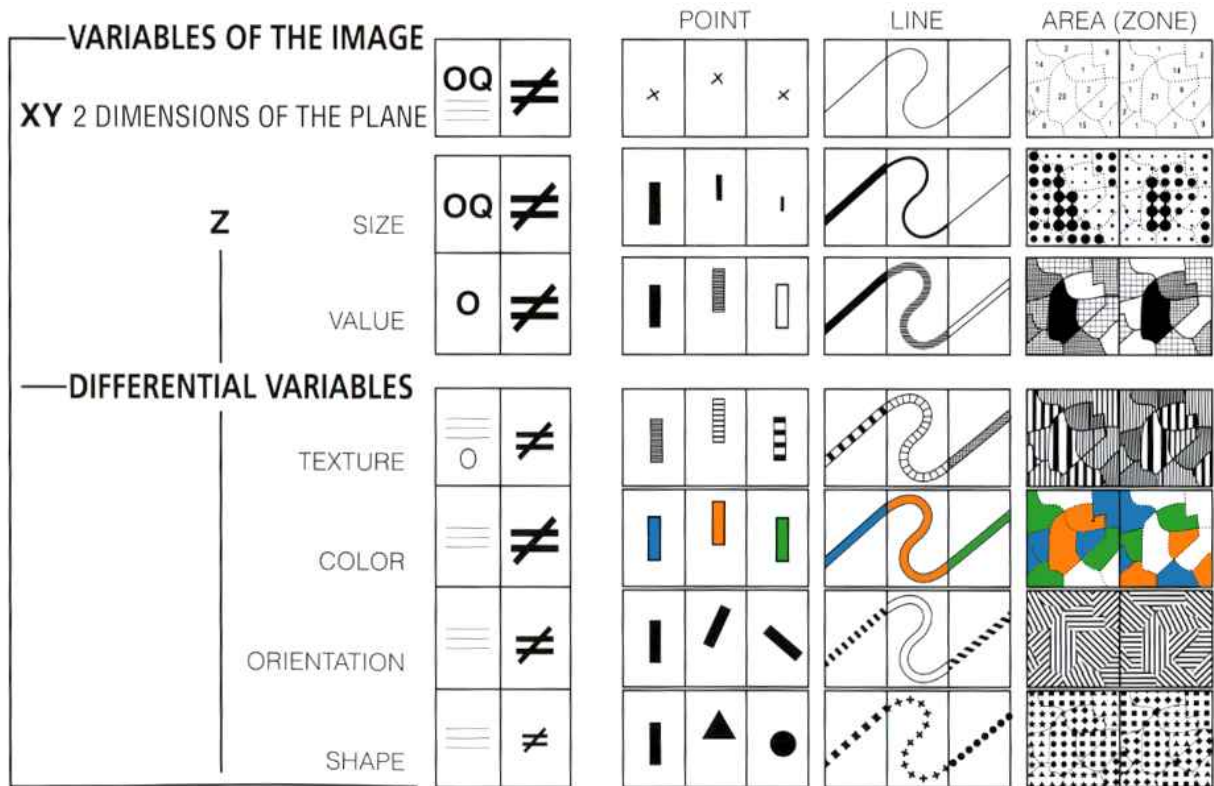
- Assign **data fields** to **visual channels** for a chosen **graphic mark type**
- Additional concerns include choosing appropriate encoding parameters and **data transform**
- These options define a large combinatorial space, containing both **useful and questionable** charts!




1.2 Visual Encoding Channels



1.3 Visual Channels with Graphic Mark Types

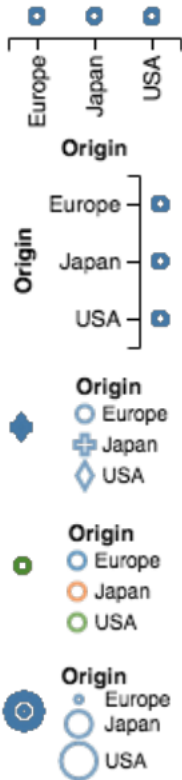


1.4 Practice on the website

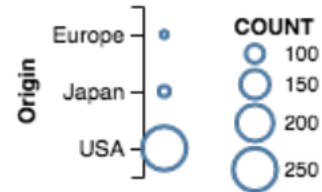
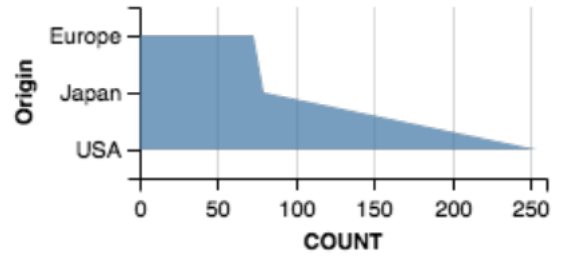
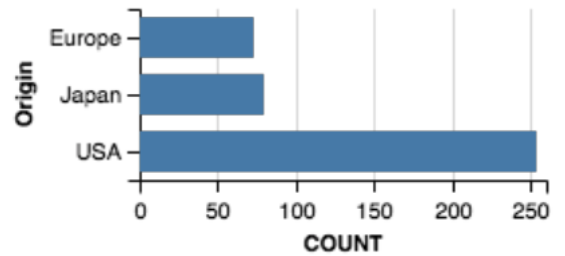
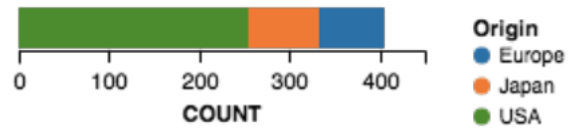
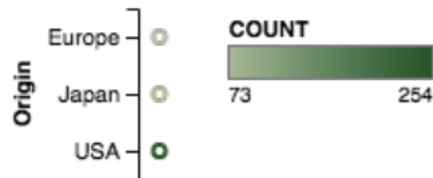
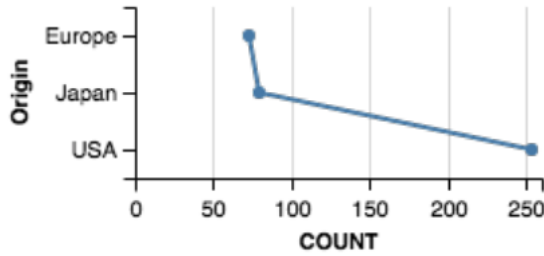
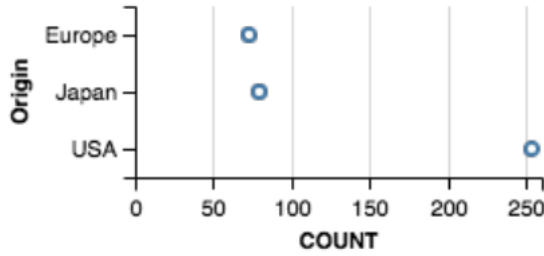
 vega.github.io/voyager/

1D: Nominal

Raw

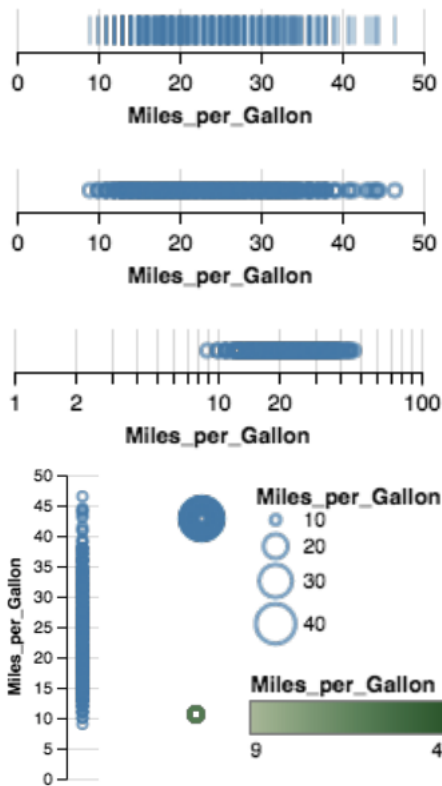


Aggregate (Count)

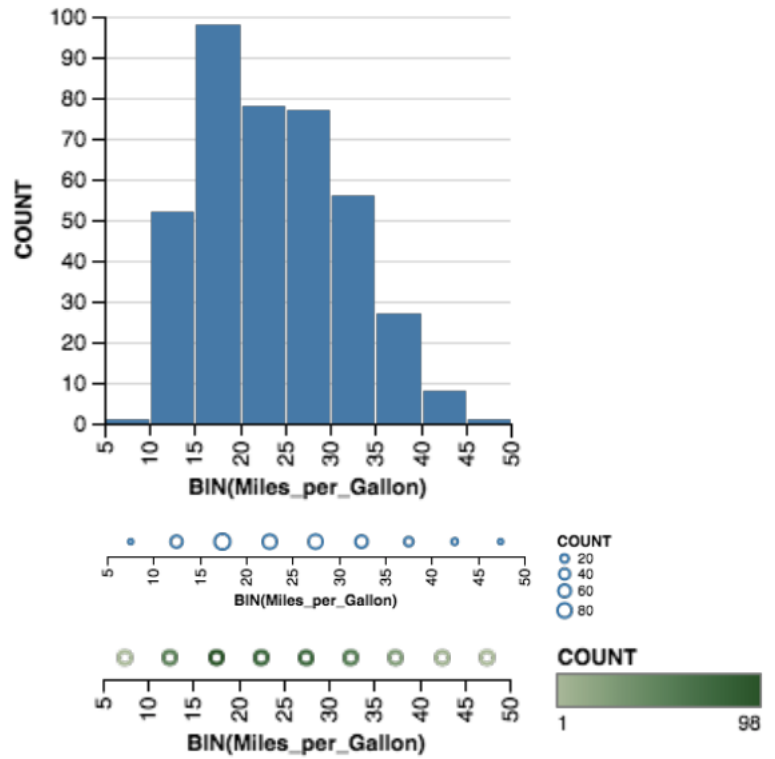


1D: Quantitative

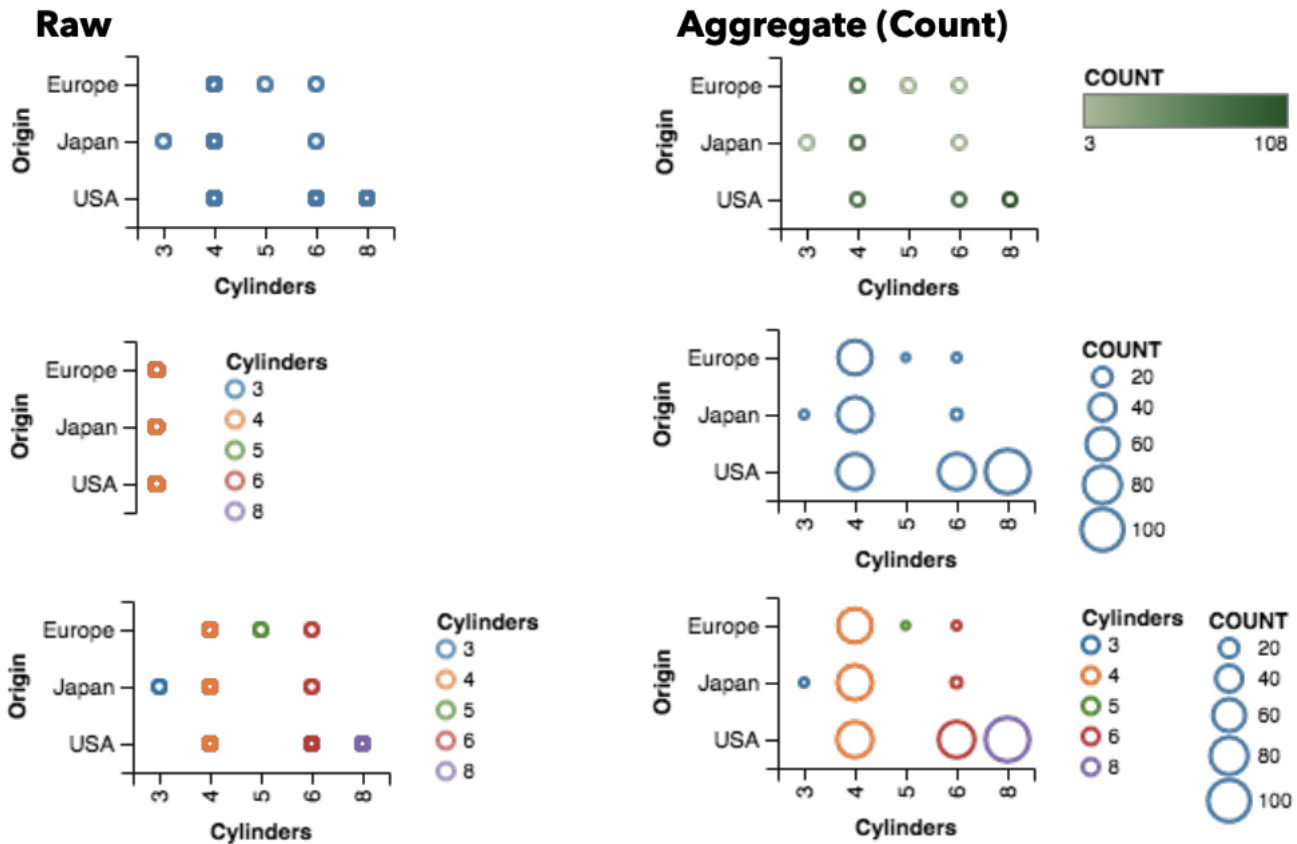
Raw



Aggregate (Count)



2D: Nominal x Nominal













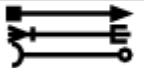



2. Encoding Effectiveness

2.1 Properties of Visual Encodings

- Different visual properties vary or may be modified in different ways, which makes them good for encoding different types of data.
- **Two key factors:**
 - a. Whether a visual property is naturally ordered
 - b. How many distinct values

2.2 Choosing Appropriate Visual Encodings

Example	Encoding	Ordered	Useful values	Quantitative	Ordinal	Categorical	Relational
	position, placement	yes	infinite	Good	Good	Good	Good
1, 2, 3; A, B, C	text labels	optional alpha or num	infinite	Good	Good	Good	Good
	length	yes	many	Good	Good		
	size, area	yes	many	Good	Good		
	angle	yes	medium	Good	Good		
	pattern density	yes	few	Good	Good		
	weight, boldness	yes	few		Good		
	saturation, brightness	yes	few		Good		
	color	no	few (<20)			Good	
	shape, icon	no	medium			Good	
	pattern texture	no	medium			Good	
	enclosure, connection	no	infinite			Good	Good
	line pattern	no	few				Good
	line endings	no	few				Good
	line weight	yes	few		Good		