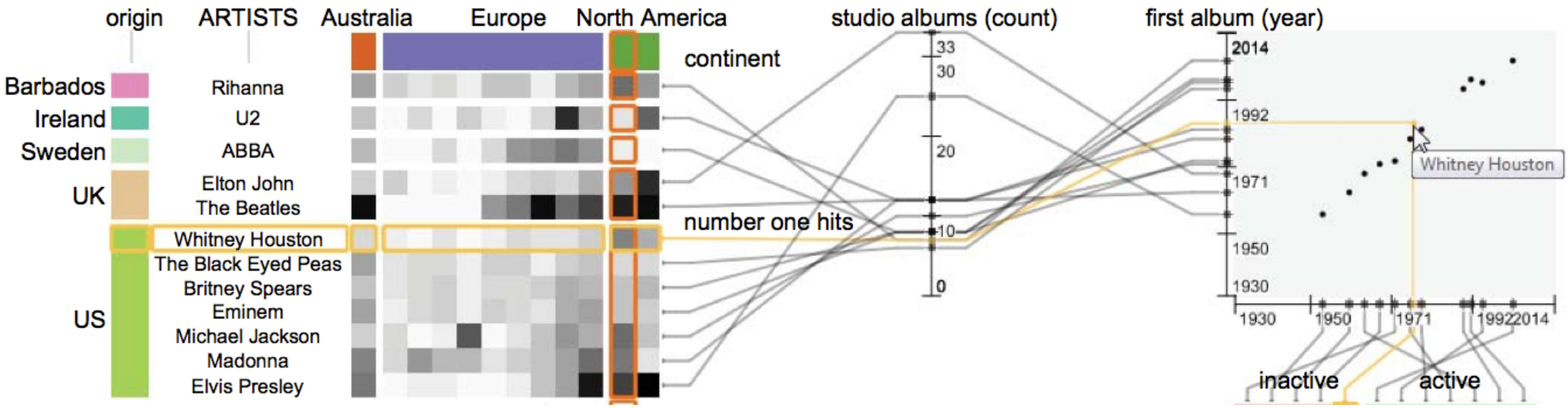
Domino: Extracting, Comparing, and Manipulating Subsets across Multiple Tabular Datasets

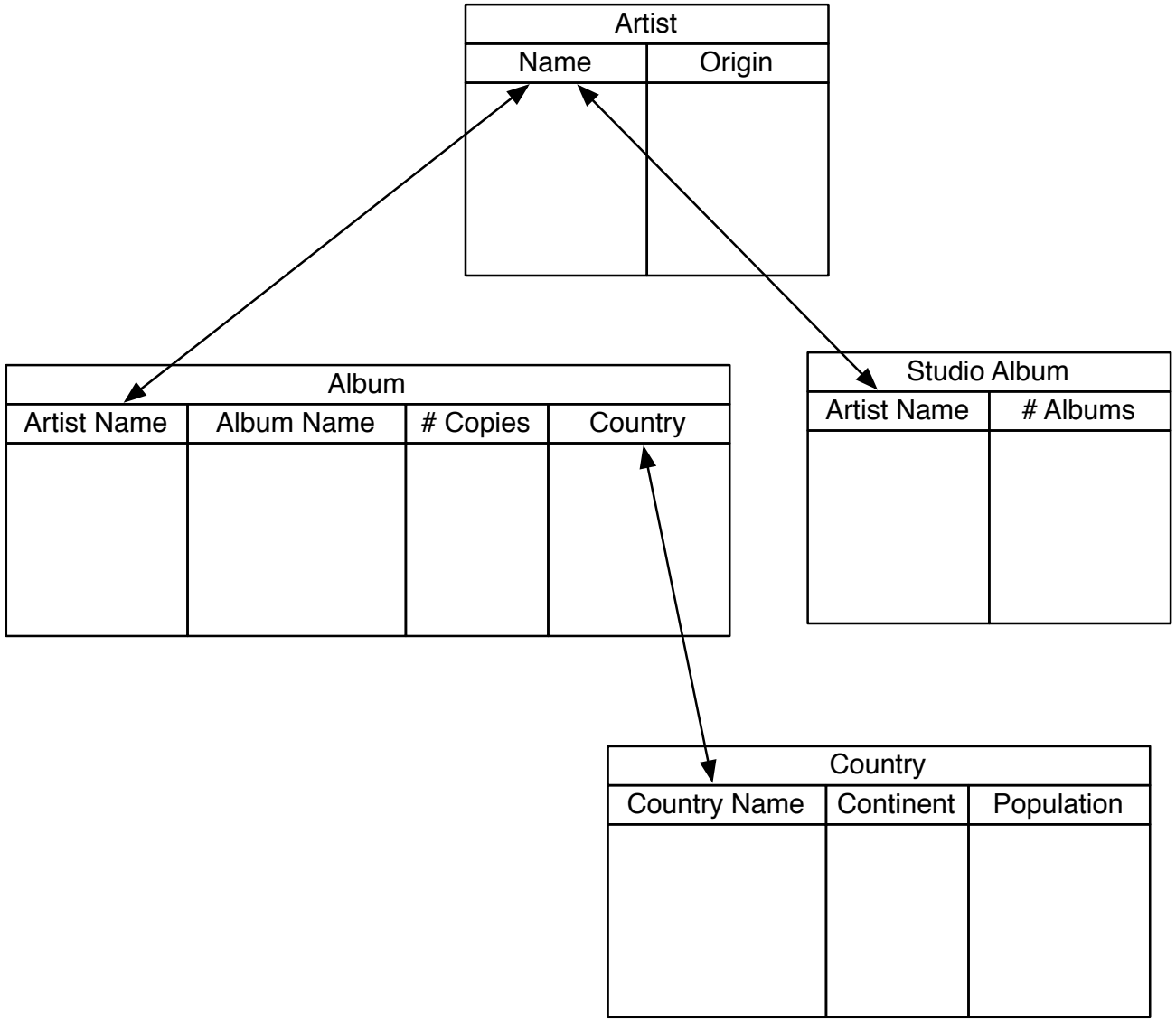
Presented by: Jessica Wong



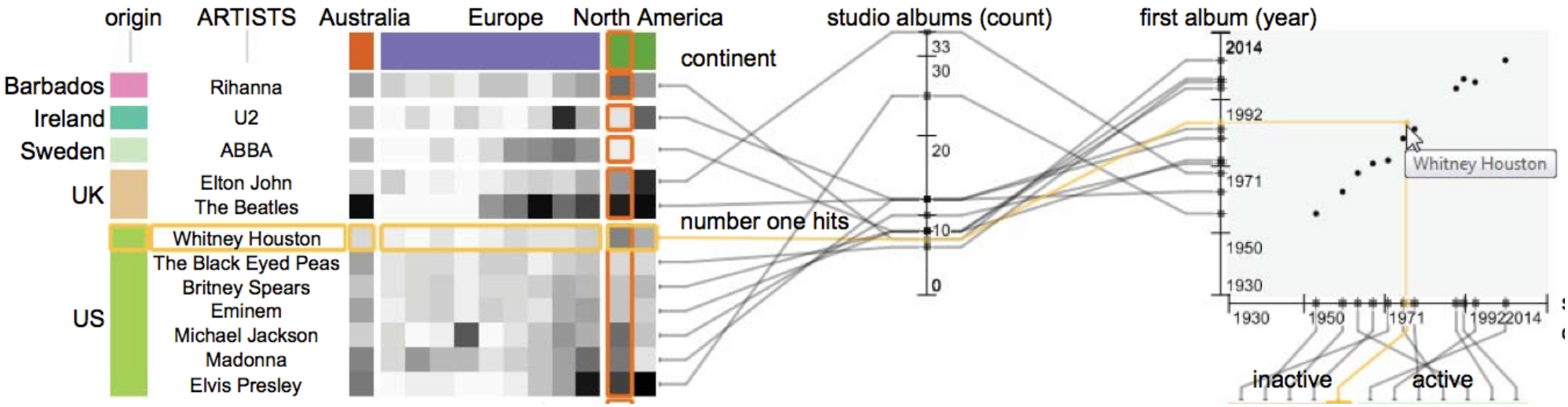
What is Domino?

- Designed for datasets with many different heterogeneous subsets that share identifiers
- Visualize subsets and the relationships between them

For example…


Artist
Name
Origin
Album
Artist Name
Album Name
Copies
Country
Studio Album
Artist Name
Albums
Country
Country Name
Continent
Population

Domino

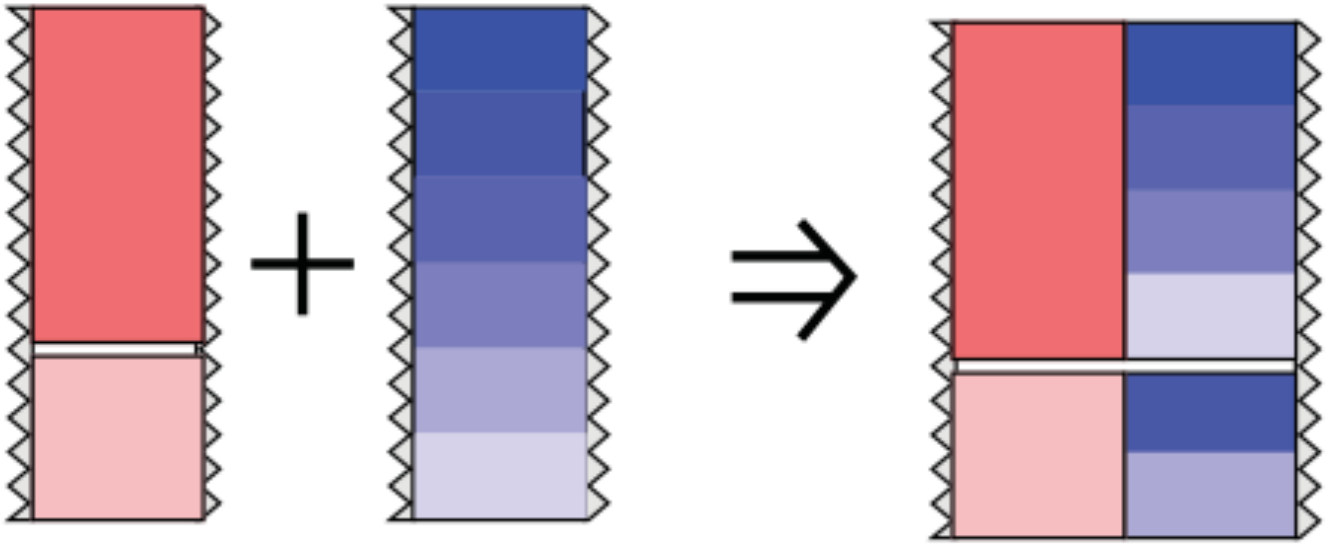

origin
ARTISTS
Australia
Europe
North America
continent
studio albums (count)
first album (year)
Barbados
Ireland
Sweden
UK
US
Rihanna
U2
ABBA
Elton John
The Beatles
Whitney Houston
The Black Eyed Peas
Britney Spears
Eminem
Michael Jackson
Madonna
Elvis Presley
number one hits
33
30
20
10
0
2014
1992
1971
1950
1930
1930
1950
1971
19922014
Whitney Houston
inactive
active

Blocks

- Represents a subset
- Three types
  - Partitioned
  - Numerical
  - Matrix

Blocks

- You can perform set operations on blocks (union, intersect, difference, etc.)

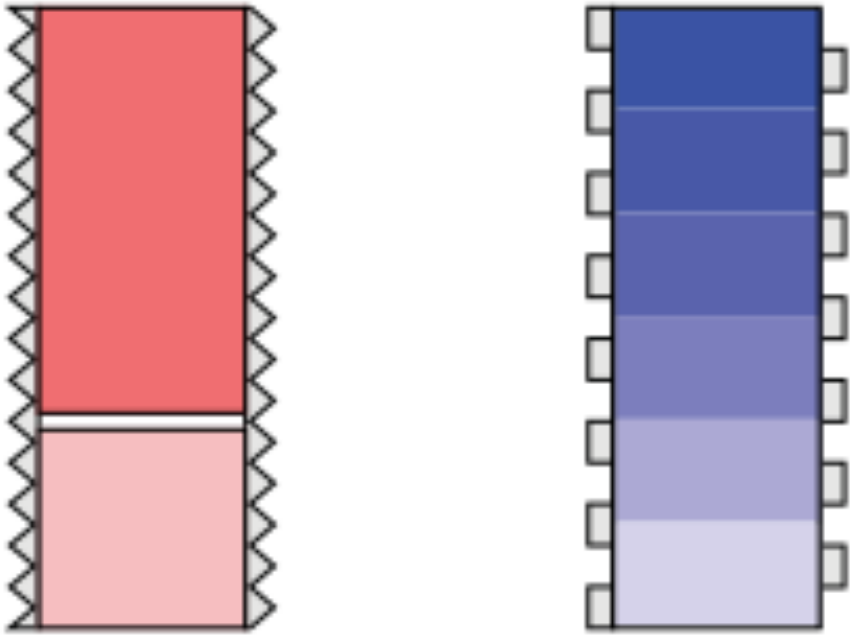


Block Relationships

- A relationship degree defines how strongly related two blocks are
  - Based on whether blocks share an item type, sorting, and partitioning method

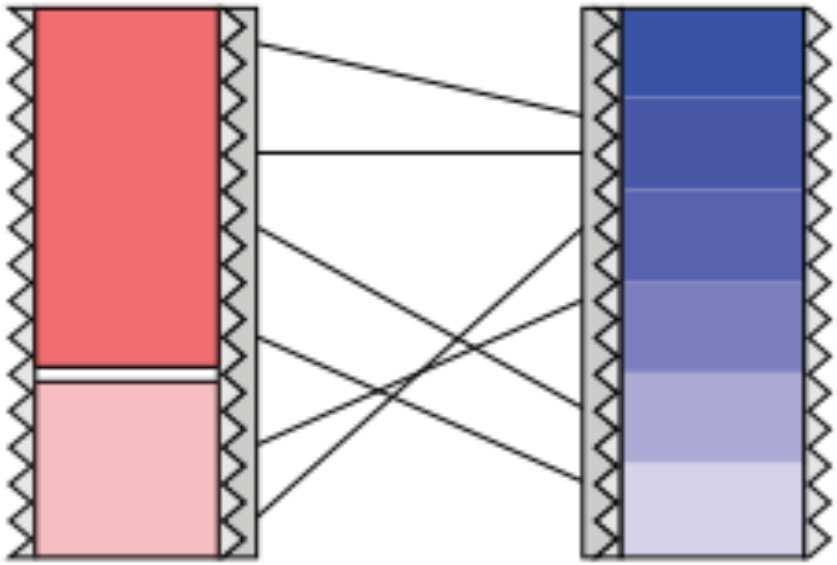
Block Relationships

- Four types of relationship degrees:
  - None



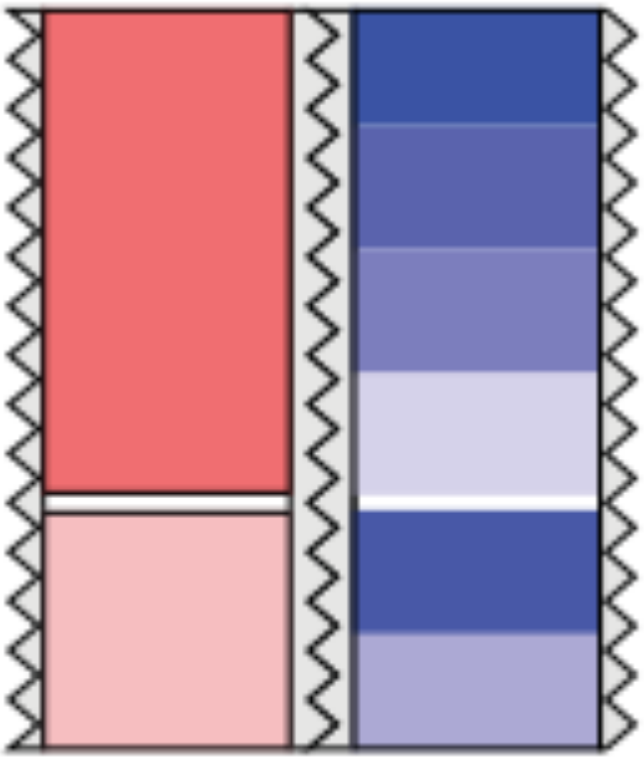
Block Relationships

- Four types of relationship degrees:
  - None
  - Weak



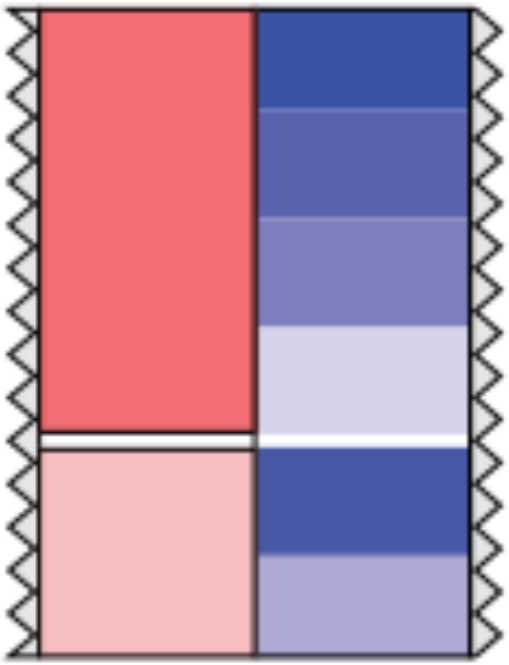
Block Relationships

- Four types of relationship degrees:
  - None
  - Weak
  - Medium



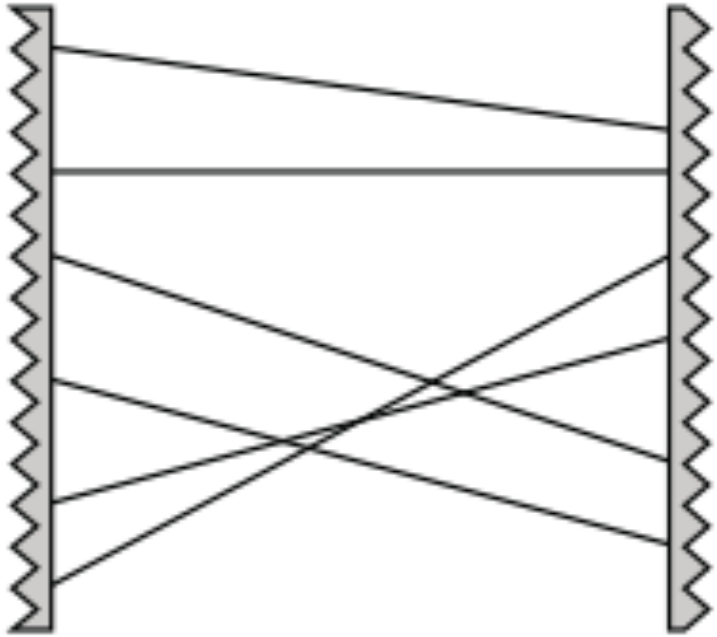
Block Relationships

- Four types of relationship degrees:
  - None
  - Weak
  - Medium
  - Strong



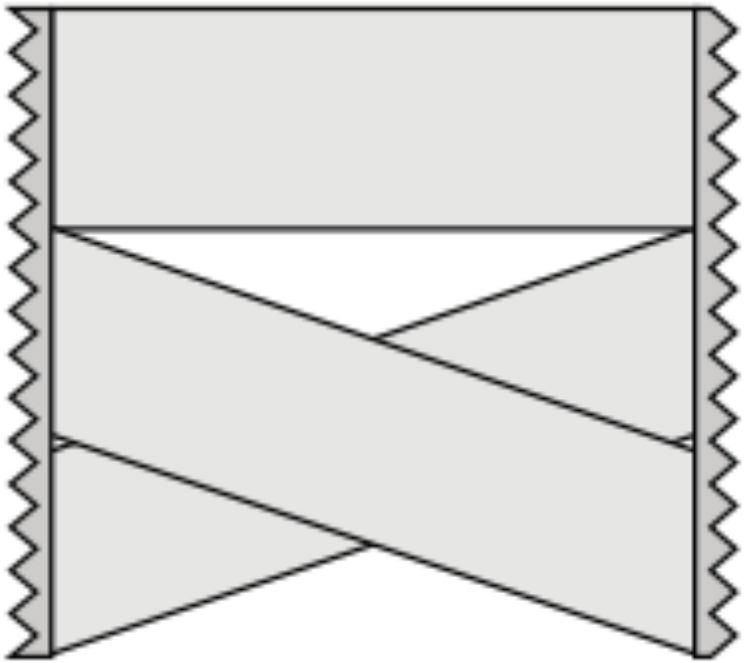
Block Relationships

- Weak and medium relationships can be shown at three levels
  - Item



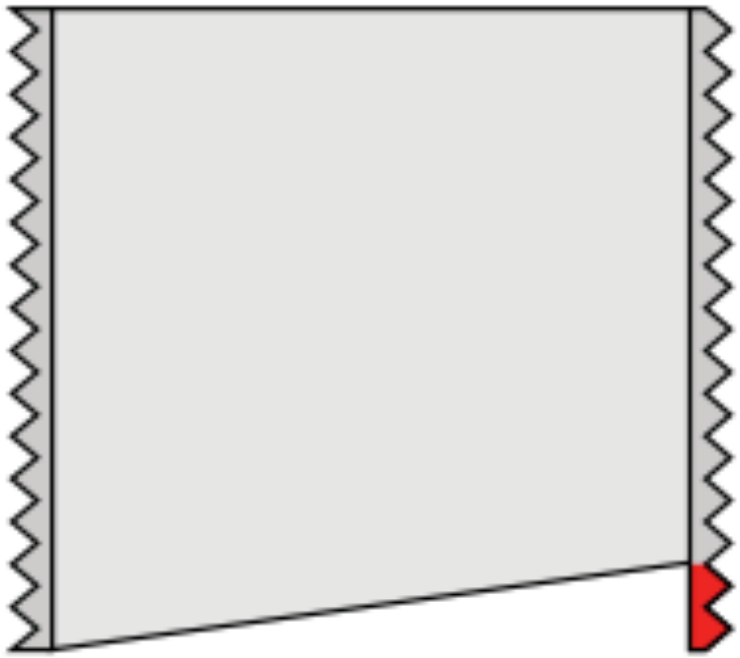
Block Relationships

- Block relationships for weak and medium relationships can be shown at three levels
  - Item
  - Group



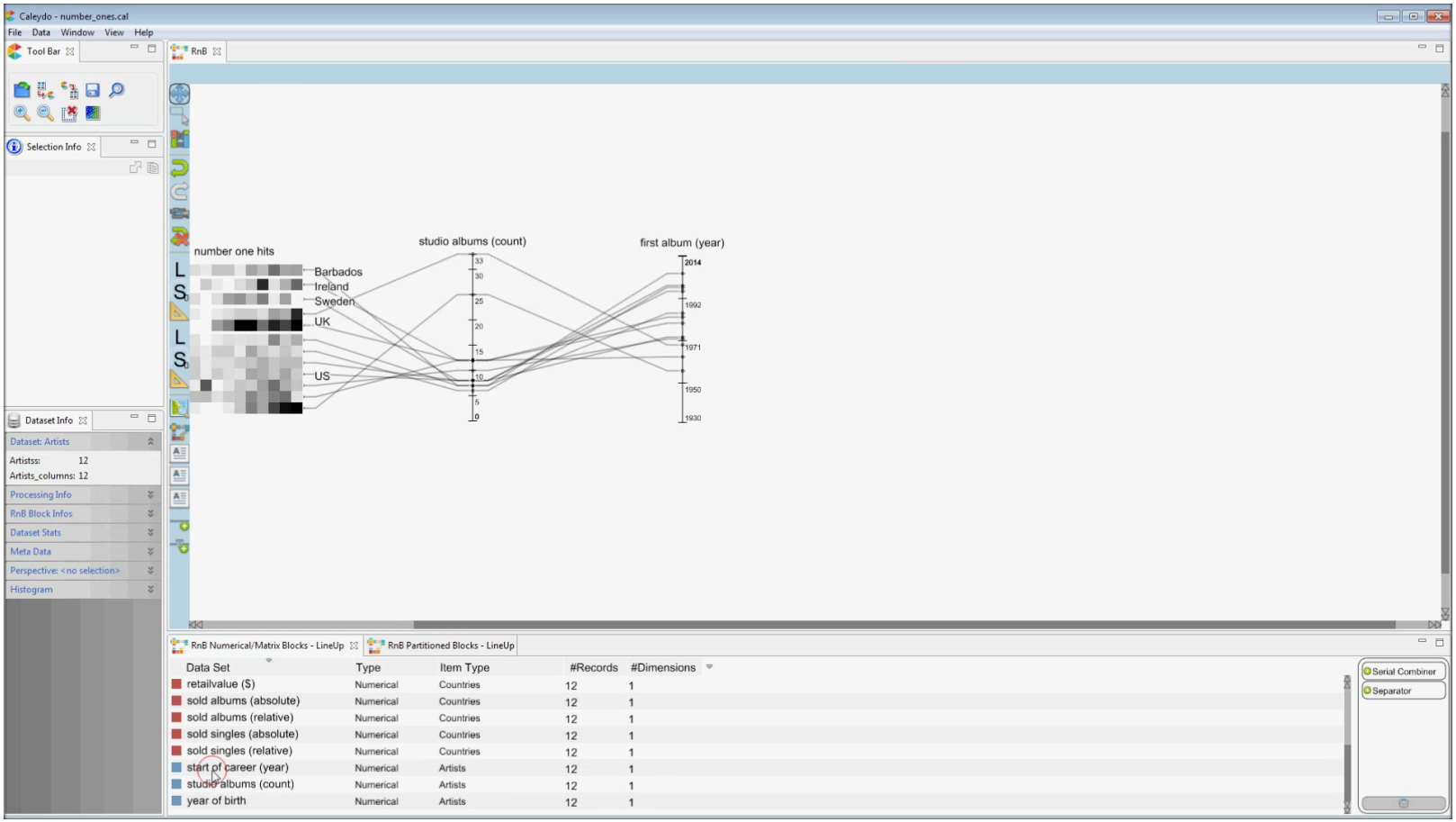
Block Relationships

- Block relationships for weak and medium relationships can be shown at three levels
  - Item
  - Group
  - Block



Domino

- Implementation uses Caleydo (Java, OpenGL)



Domino


Caleydo - number_ones.cal
File Data Window View Help
Tool Bar
RnB
Selection Info
artists (12)
MouseOver 1 (8.3%) Rihanna
Rihanna
Dataset Info
Dataset: Artists
Artistss: 12
Artists_columns: 12
Processing Info
RnB Block Infos
Dataset Stats
Meta Data
Perspective: <no selection>
Histogram
origin
Australia
Europe
North America
COUNTRIES
Australia
France
Italy
Sweden
Spain
Austria
Germany
Netherlands
Ireland
UK
US
Canada
ARTISTS
gender
female
Britney Spears
Madonna
Rihanna
Whitney Houston
group
ABBA
The Beatles
The Black Eyed Peas
U2
male
Elton John
Elvis Presley
Eminem
Michael Jackson
female ∩ Barbados
|4| ∩ |1| = |1| (25.00%, 100.00%)
continent
Barbados
Ireland
Sweden
UK
US
number one hits
population (million)
retailvalue ($)
5 Artists
5 Countries
studio albums (count)
first album (year)
start of career (year)
career status
in business (years)
inactive
active
RnB Numerical/Matrix Blocks - LineUp
RnB Partitioned Blocks - LineUp
Data Set
Type
Item Type
#Records
#Dimensions
first album (year) Numerical Artists 12 1
in business (years) Numerical Artists 12 1
in business at first album (years) Numerical Artists 12 1
number one hits Matrix Artists,Countries 12 12
population (million) Numerical Countries 12 1
retailvalue ($) Numerical Countries 12 1
sold albums (absolute) Numerical Countries 12 1
sold albums (relative) Numerical Countries 12 1
Serial Combiner
Separator

Idioms

- Colour (different partitions)
- Width encoding of the block relationship bands
- Spatial position of blocks conveys relationship
- Parallel and rectilinear layouts

Idioms

- Juxtaposed views
- Highlighting between views
- Filtering (different relationship granularities)
- Zooming/panning

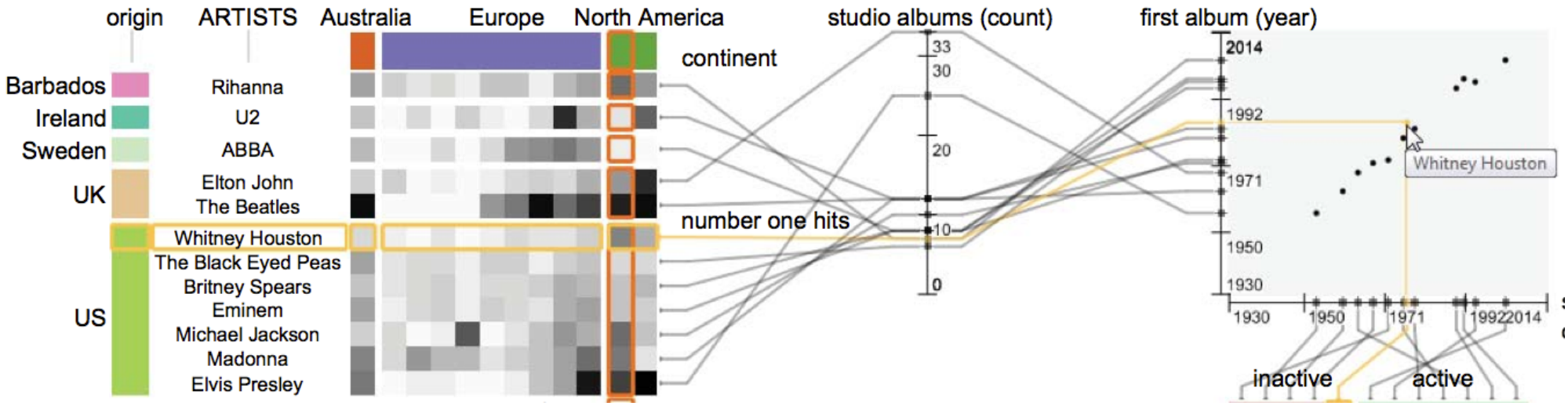
Comments

- Can be confusing with all the blocks put together
- Overlapping lines between blocks can be hard to read
- Examples given in the paper can be confusing

Comments

- Letting people choose could be good or bad
- A study on how whether the user created visualization is a complete display of info or actually just focuses on the target task could be interesting

Recap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Questions?