Gestalt Laws

Dr. Gaurav Bansal

Gestalt Theory

Gestalt theory proposes that we see by forming light and dark objects, edges and contours into a whole image **without thinking** about it.

Gestalt is a psychology term which means "**unified whole**". It refers to theories of visual perception developed by German psychologists in the 1920s. These theories attempt to describe how people tend to organize visual elements into groups or unified wholes when certain principles are applied.

Word gestalt means “pattern” in German.

These laws easily translate into a set of design principles for information displays.

Some Salient Gestalt Principles (Stephen Few)

Proximity: Objects that are close together are perceived as a group.

Similarity: Objects that share similar attributes (e.g. color or shape) are perceived as a group.

Enclosure: Objects that appear to have a boundary around them are perceived as a group.

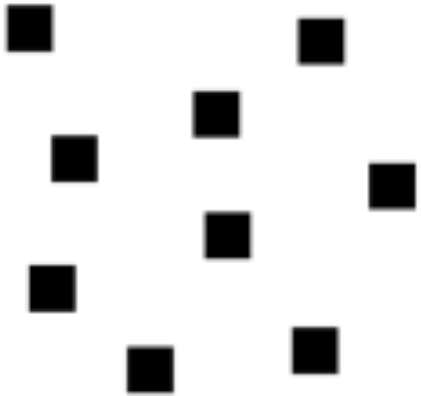
Closure: Open structures are perceived as closed, complete and regular whenever there is a way that they can be reasonably interpreted as such.

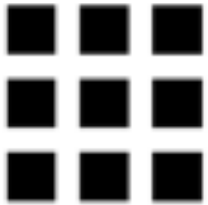
Continuity: Objects that are aligned together or appear to be a continuation of one another are perceived as a group.

Connection: Objects that are connected (e.g., by a line) are perceived as a group.

Proximity

Proximity (spatial distribution) guides what we perceive as cluster or group!

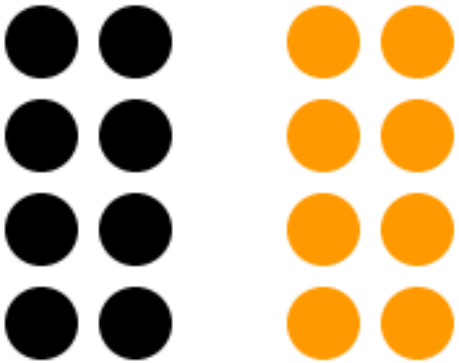




The second set seems like a unified cluster!

Similarity

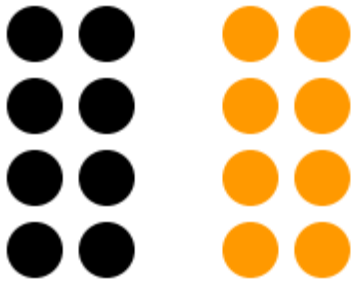
These groups appear to be separated by color or contrast.



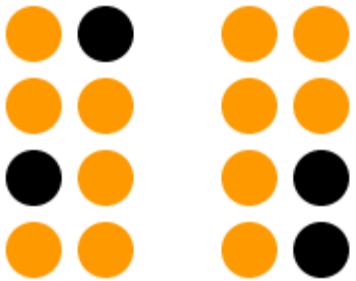
It seems like we have two distinct groups here.

Proximity Overpowers Similarity

These groups appear to be separated by color or contrast.



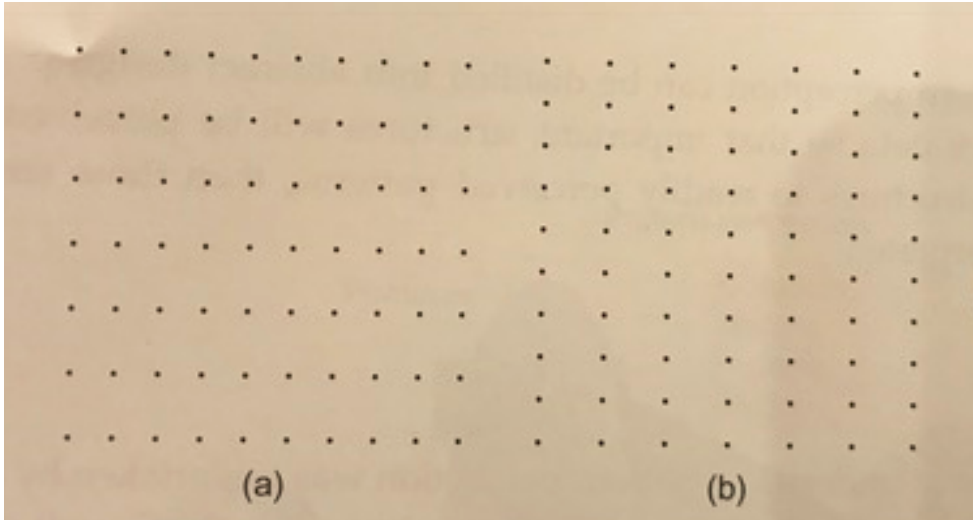
Proximity overpowers other signals of distinction, as seen in this example.



It seems like **proximity** is overpowering the **similarity** effect.

http://www.andyrutledge.com/gestalt-principles-3.php

Spatial Proximity and Row Perception

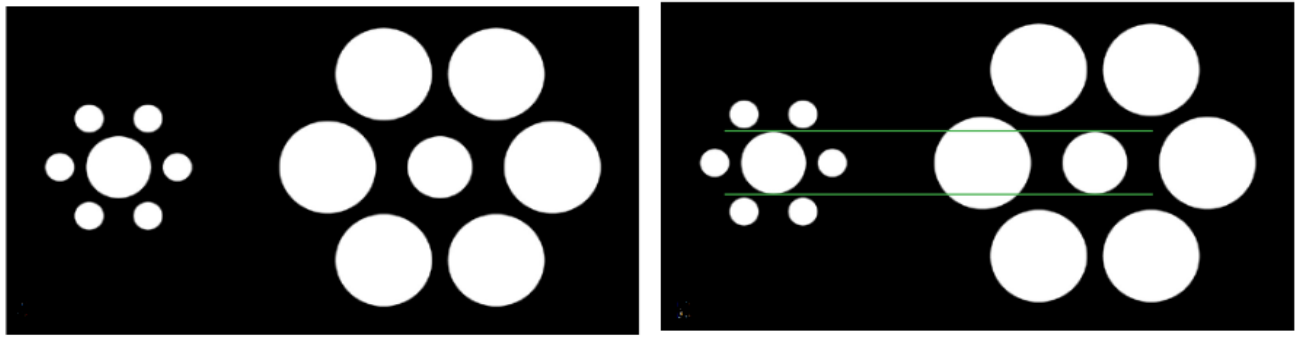


Dots are perceived as rows on left, but as columns on right.

Spacing (proximity) between the dots changes the perception!

Proximity Affects Size Perceptions

A B

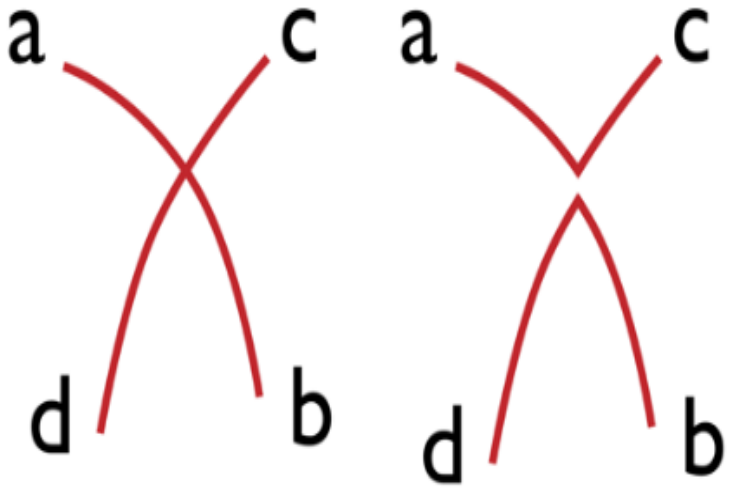


The inner circle in cluster A seems to be bigger than the inner circle in cluster B.

Even though they are of same size!

Continuity

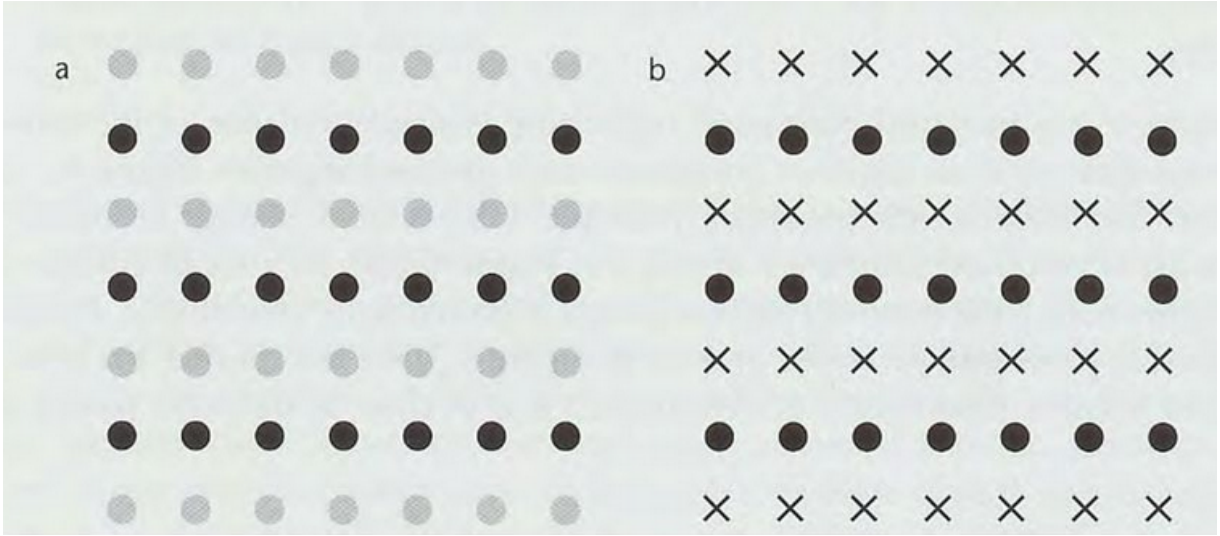
We have a tendency to group and organize lines or curves that follow an established direction over those defined by sharp and abrupt changes in direction.



We associate A with B, and Similarly C with D. We do not associate A with C!

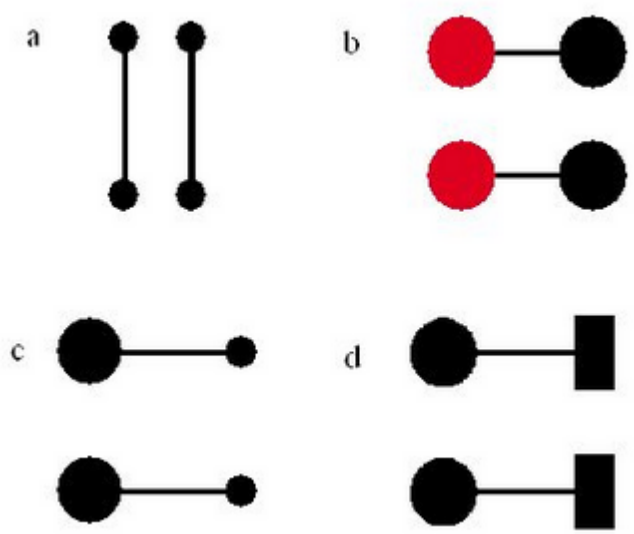
https://en.wikipedia.org/wiki/Principles_of_grouping

Connectedness

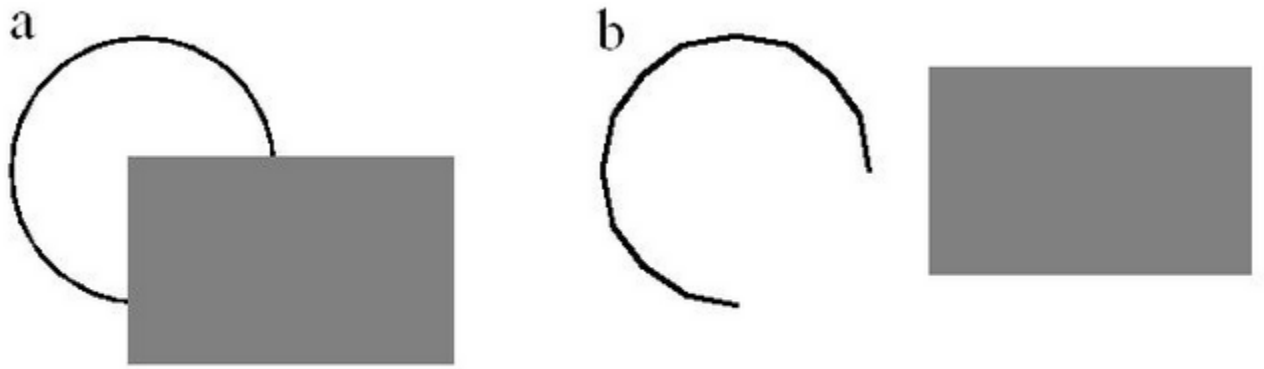


Similarity between the elements in alternate rows causes the row percept to dominate (Colin Ware, 2013).

Connectedness overpowers (a) proximity, (b) color, (c) size, or (d) shape.

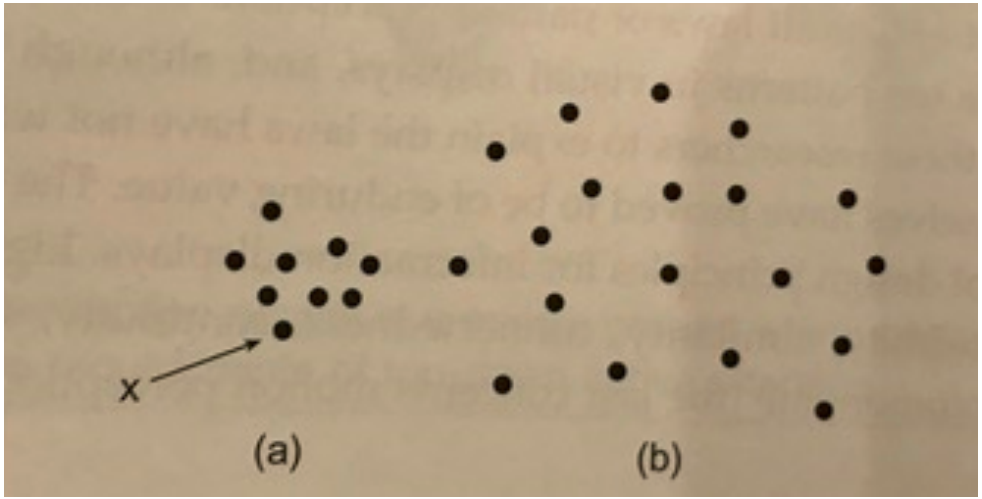


Closure Overrules Proximity



a circle behind a rectangle as in (a), not a broken ring as in (b).

Spatial Concentration



Dot **x** is perceived to be part of cluster **a** and not cluster **b**.

Common Fate (Concerns Motion Perception)

Elements moving in the same direction are perceived as being more related than elements that are stationary or that are moving in different directions.

http://www.andyrutledge.com/closure.php

Closure

Three rectangular boxes, or three i-beams?

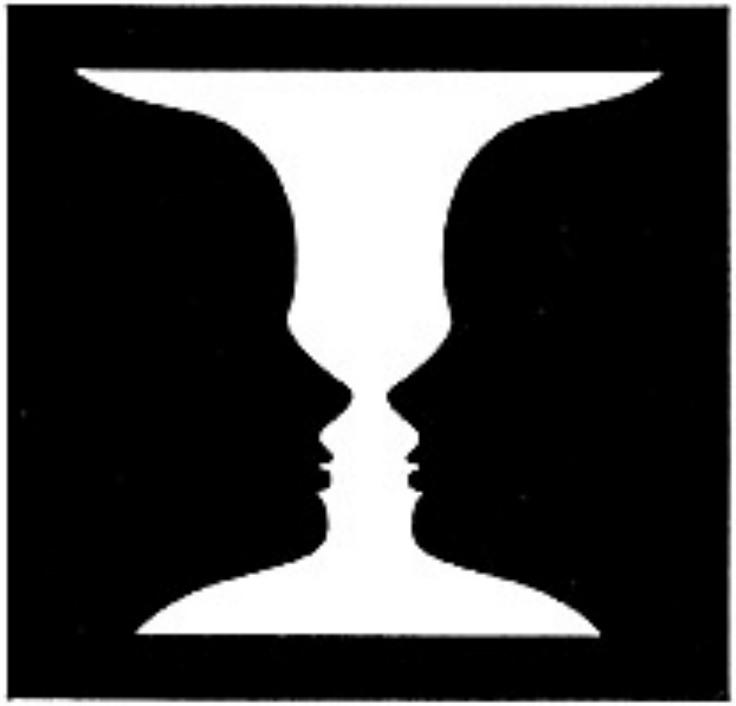
When presented with less than the full picture, we attempt to employ the principle of closure to fill in missing information and form a complete image or idea based on common or easily recognizable patterns from our past experience and understanding.

A shoe?

Figure-Ground

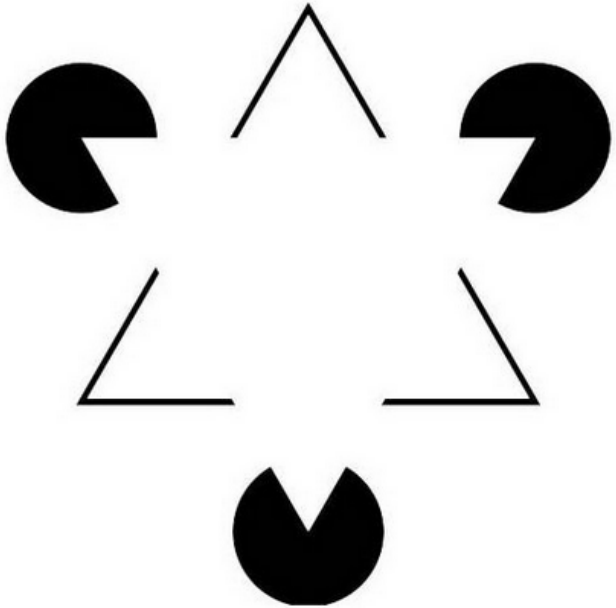
White vase as figure and black as ground
vs
Black faces as figure and white as ground

Elements are perceived as either figures (distinct elements of focus) or ground (the background or landscape on which the figures rest).



Law of Pragnanz

Perceived as five rings.



Perceived as two triangles.

Humans tend to reduce complex figures to the simplest form possible

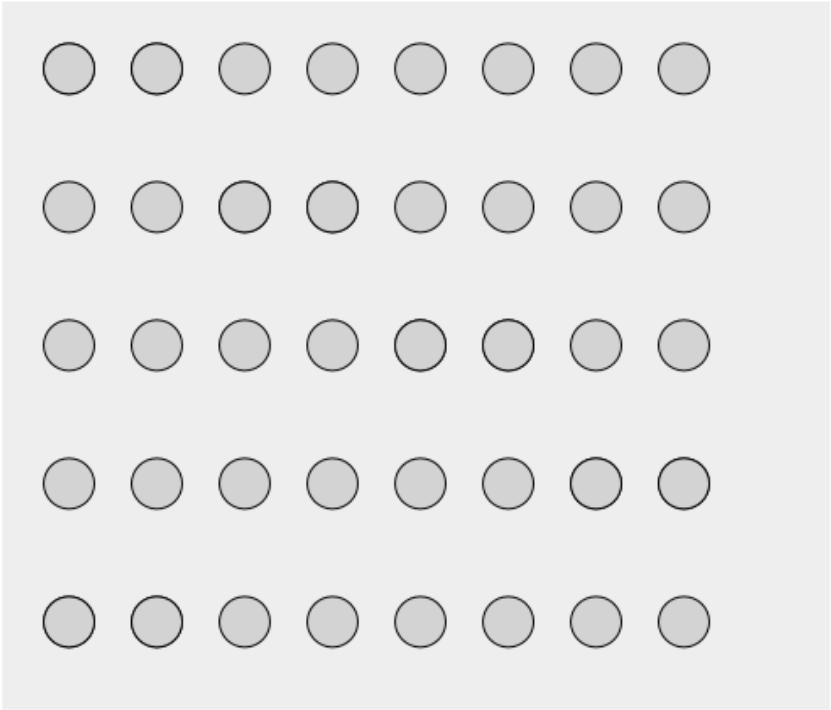
https://www.thinglink.com/scene/457542149915803649

In the next few slides we will evaluate a series of dots under the influence of three different Gestalt Principles “Proximity, Similarity and Enclosure”

(Reference: https://emeeks.github.io/gestaltdataviz/section1.html)

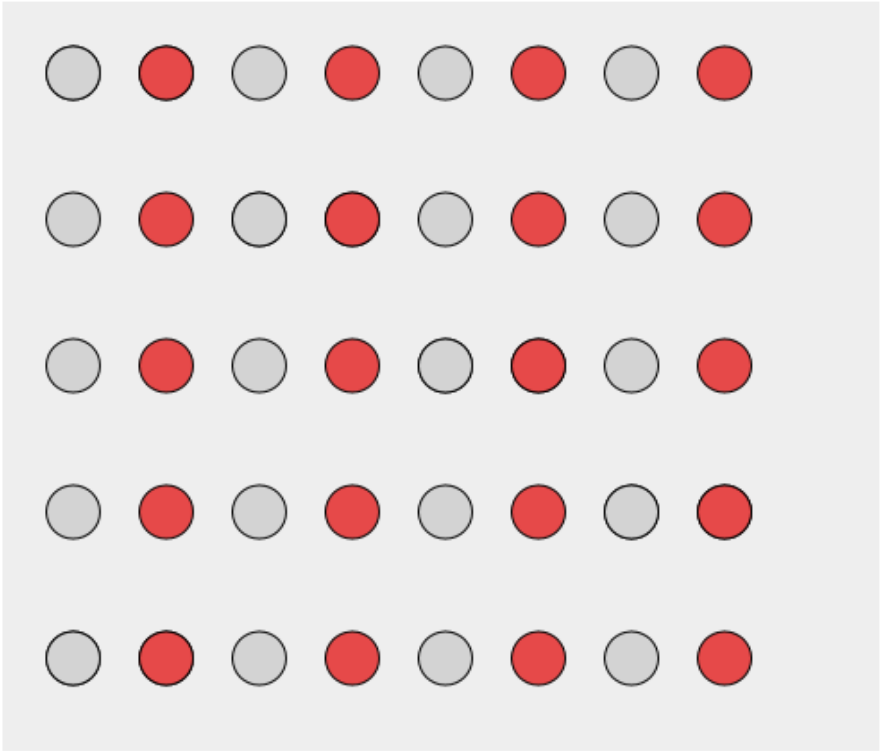
We probably see rows.

(Subtle Revelation: Proximity is at play here!)



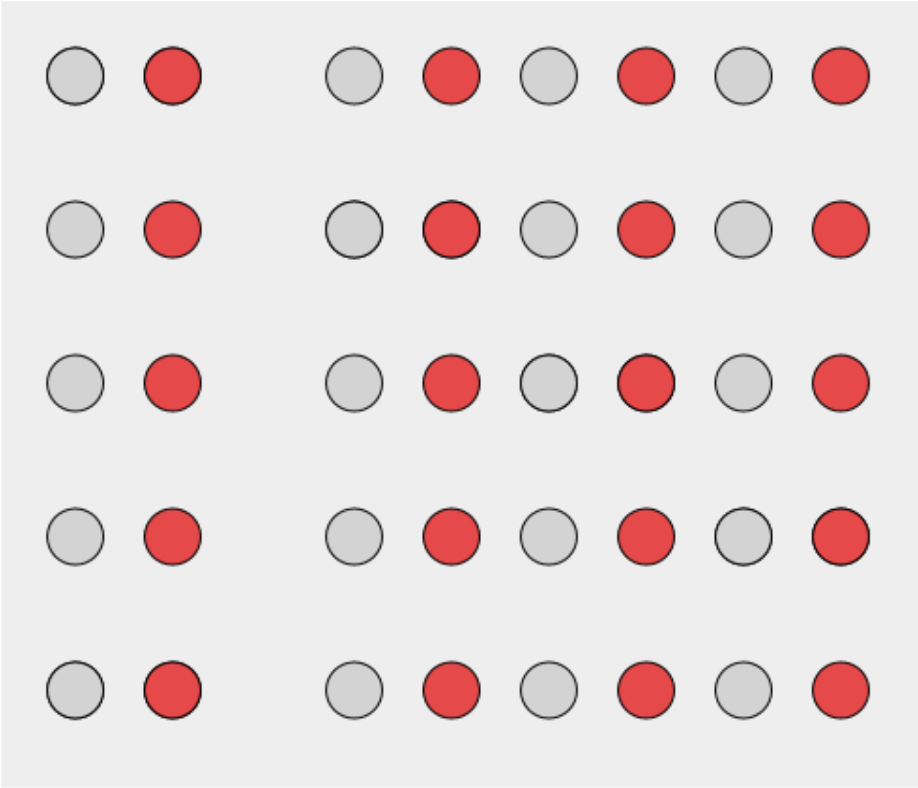
We probably see columns

(Subtle Revelation: Similarity overpowers proximity.)

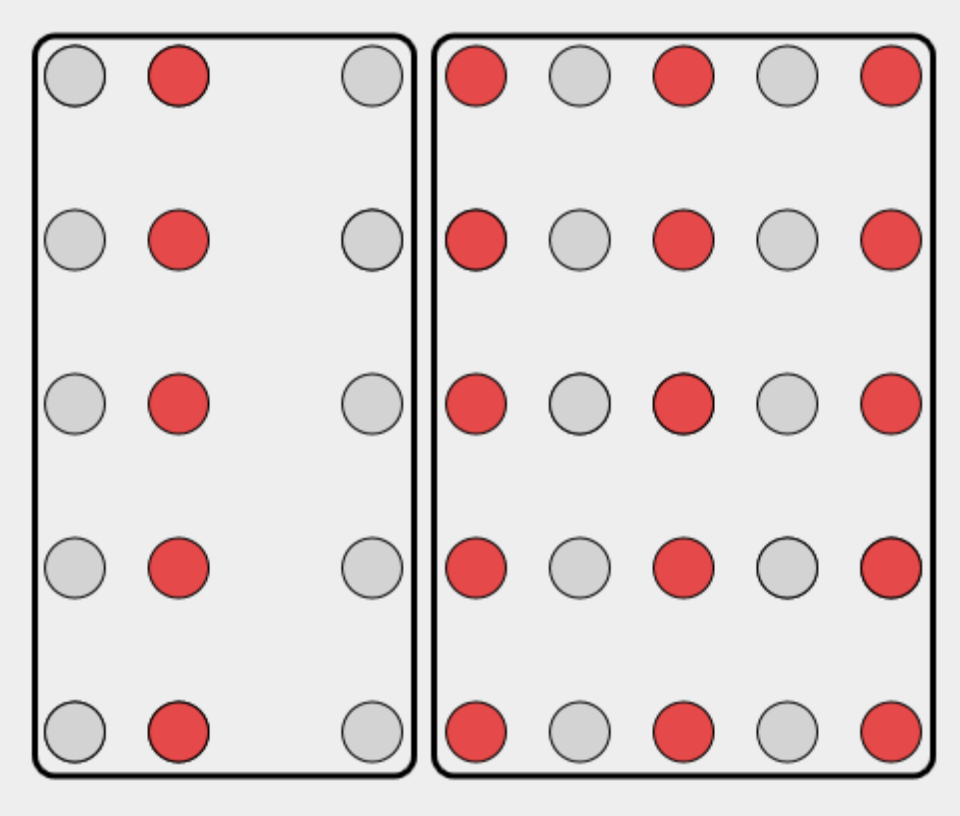


We probably see two groups.

(Subtle Revelation: We still see **similarity** dominated columns, but spread over two distinct groups created by **proximity**.)



Enclosure overrules everything else so far!



Concluding thought…

To create effective design, we need to be aware of the gestalt principles and their **pecking** order along with other signals those graphics are sending.

References:

Information and Visualization (3rd edition) by Colin Ware, 2013

http://graphicdesign.spokanefalls.edu/tutorials/process/gestaltprinciples/gestaltprinc.htm

http://courseweb.stthomas.edu/mjodonnell/cojo232/pdf/gestalt.pdf

http://www.andyrutledge.com/gestalt-principles-1-figure-ground-relationship.php

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