Project 1 for Data Visualization ST 2024

Data: Color measurements of prints of Douglas color cards

Production Process Info:

- 42 color cards are printed on one large sheet with 7 rows and 6 columns, as in the picture below

- each individual color card has 64 color spots (see larger picture on third page), the corner ones of which are grey circles (used for position adjustment) while all others are squares
- a QR code on the color card identifies its position on the large sheet (row numbers from 1 to 7, column numbers from 1 to 6), which is also called “target”

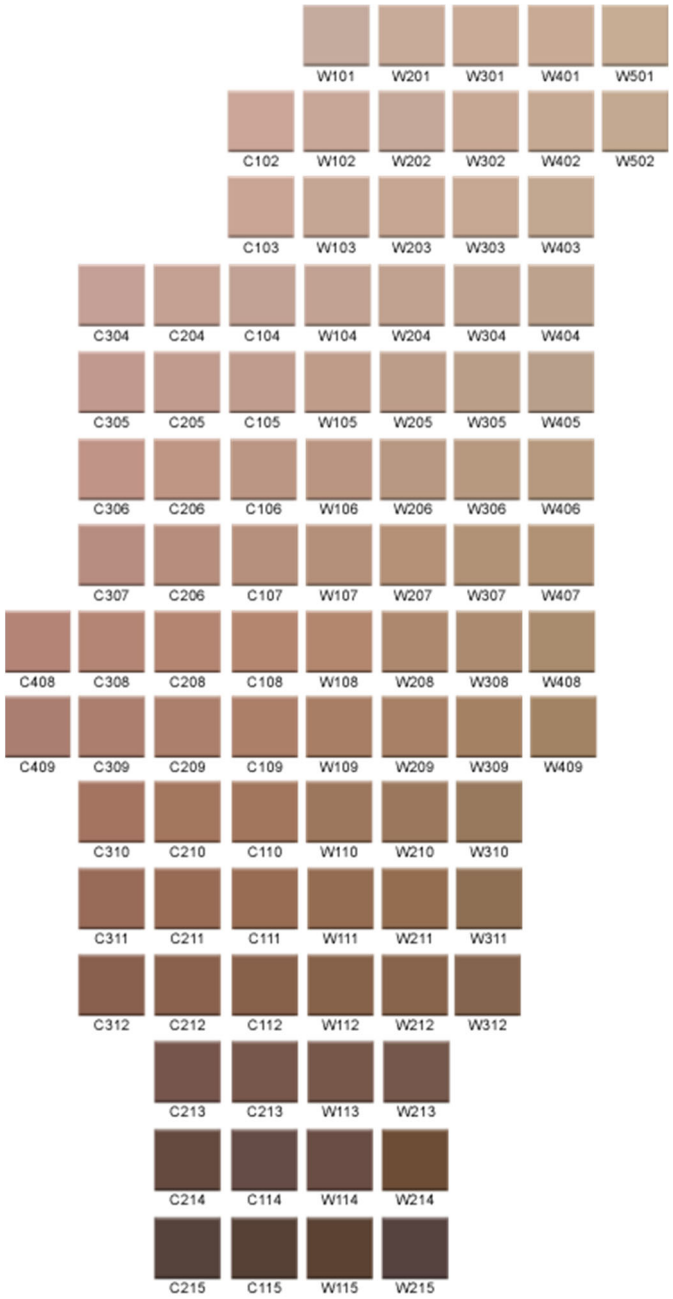
Data source:

Thirteen of the large sheets have been sampled from production;
there are thus measurements for 42*13 color cards

Background info

The cards are used for determining customer's skin color, using an app (search for *Douglas color expert*).

The Douglas system has skin color codes (see below).



Files: **LabMeasurements-Color-Card.csv**

contains the measurements

format: csv wit „,“ as decimal separator and „;“ as separator

column headers:

Row, Column (target position on large sheet of color cards)

L11, a11, b11, …, L88, a88, b88 Lab-values for color spots (1,1) to (8,8)

The first digit reflects the card’s row, the second the card’s column.

MasterColorCard.csv

contains intended colors for color card production

(obtained from the print master based on actual CMYKS values,
Lab values calculated from these; CMYKS is closer to printing;
there are no contractual targets for each color spot)

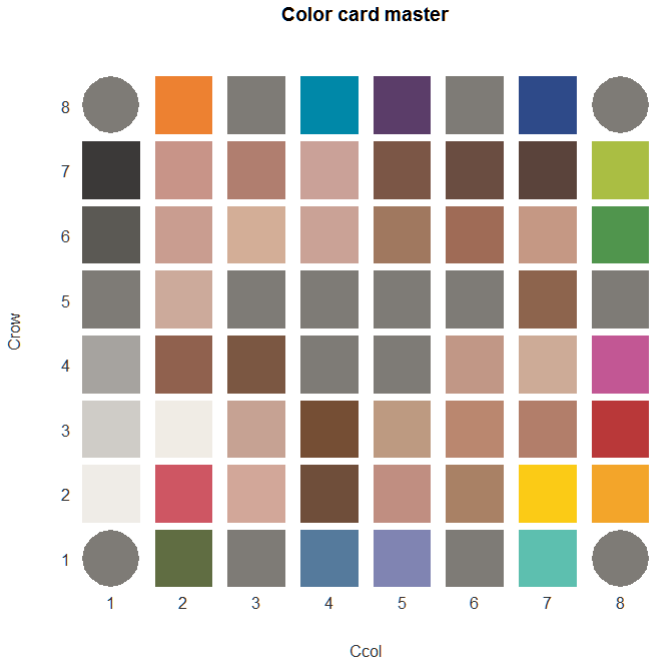
column headers:

Field (No., 1 to 64), for a single color card

Crow, Ccol (1 to 8 each, for position on a single color card)

p1 to p5: Cyan, Magenta, Yellow, Black, Special color for skin

L, a, b: calculated intended colors for comparison to measurements



Douglas does not request specific Lab or CMYKS values,
but a low dispersion of actual values:
in particular, ΔE values (refined distances in Lab space) should not be too large;
it is OK, if the dispersion for each target (=position on large sheet) is low,

because target-specific offsets can be taken care of in the app
(QR-code identifies target).

Project task:

Use visualization tools for describing what's going on in these data.
Possible aspects:

- How do colors behave relative to the print master?
  - on individual scales L,a,b?
  - in 3-dimensional Lab space?
- How does color dispersion behave?
  - on individual scales L,a,b?
  - in 3-dimensional Lab space?
- It may be of interest to familiarize yourself with ΔE values.
- Is the behavior differential between targets?
- Is the behavior differential between color spots?
- Is quality possibly related to the intended color?

Produce a report (html or pdf) that presents your results and documents the process that led to these results.

While you should use data visualization methods, it is of course not forbidden to support visualizations by calculations / calculations by visualizations.

It will be beneficial if the report makes use of „small multiples" in useful ways.