U.PORTO
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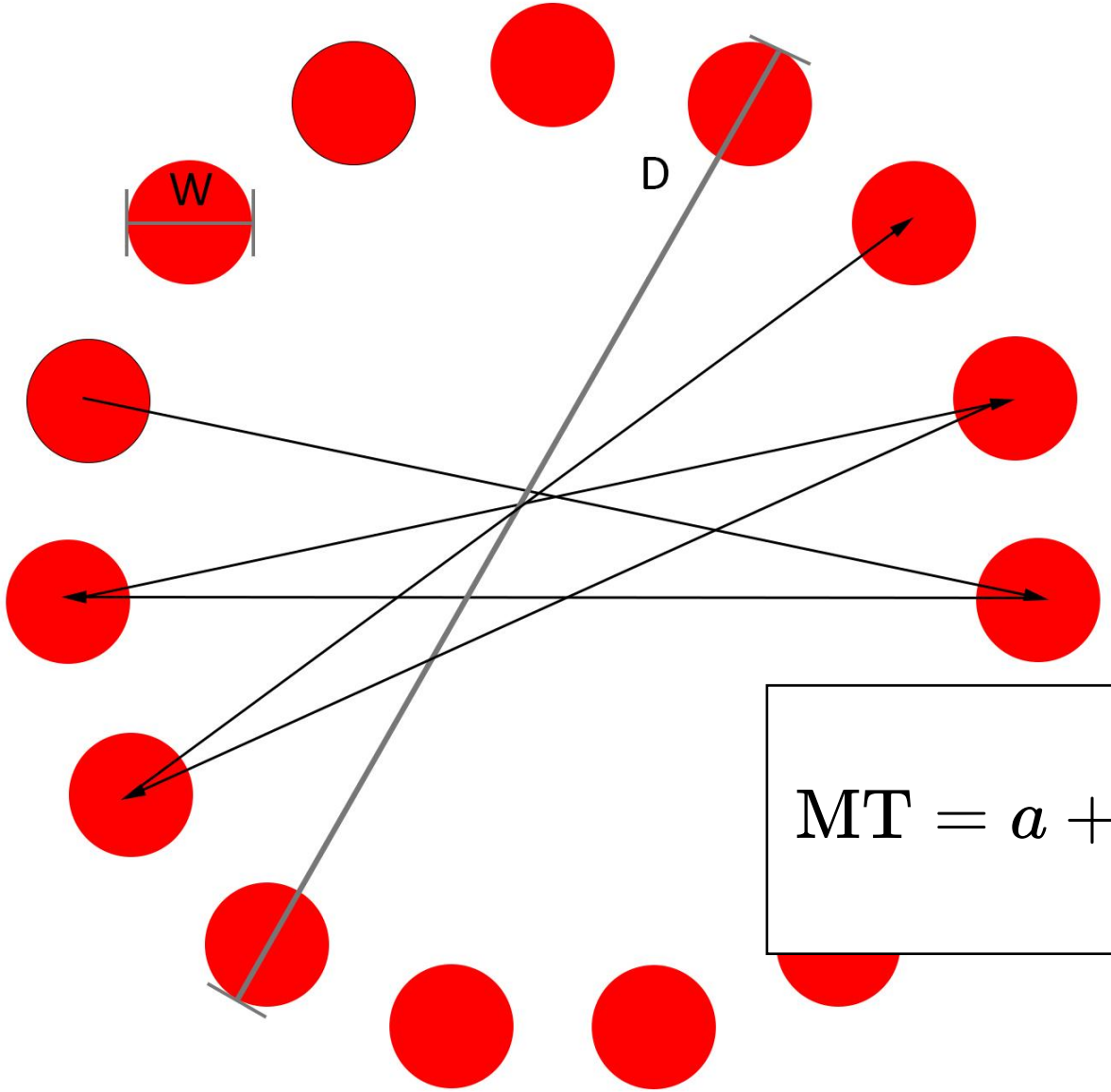
# UI Evaluation

## A beginners guide to statistics for HCI

Slides by Daniel Mendes




# Predictive Models

$$\mathrm{MT} = a + b \cdot \mathrm{ID} = a + b \cdot \log_2\left(\frac{2D}{W}\right)$$


User Evaluations


Measures
Efficacy
KIPRUTO
125TH BOSTON MARATHON
John Hancock
BOSTON ATHLETIC ASSOCIATION
adidas
usatoday.com


Measures
Efficiency


Measures
Satisfaction

# Standard Questionnaires

| System Usability Scale Questionnaire | Strongly Disagree | | | | Strongly Agree |
|---|---|---|---|---|---|
| 1. I think that I would like to use this product frequently. | 1 | 2 | 3 | 4 | 5 |
| 2. I found the product unnecessarily complex. | 1 | 2 | 3 | 4 | 5 |
| 3. I thought the product was easy to use. | 1 | 2 | 3 | 4 | 5 |
| 4. I think that I would need the support of a technical person to be able to use this product. | 1 | 2 | 3 | 4 | 5 |
| 5. I found the various functions in the product were well integrated. | 1 | 2 | 3 | 4 | 5 |
| 6. I thought there was too much inconsistency in this product. | 1 | 2 | 3 | 4 | 5 |
| 7. I imagine that most people would learn to use this product very quickly. | 1 | 2 | 3 | 4 | 5 |
| 8. I found the product very awkward to use. | 1 | 2 | 3 | 4 | 5 |
| 9. I felt very confident using the product. | 1 | 2 | 3 | 4 | 5 |
| 10. I needed to learn a lot of things before I could get going with this product. | 1 | 2 | 3 | 4 | 5 |

System Usability Scale (SUS), Brooke 96

**Mental demand**
How much mental and perceptual activity was required - thinking, deciding, calculating, searching? Was the task easy or demanding, simple or complex, exacting or forgiving?

Very Low — Very High

**Physical demand**
How much physical activity was required - pushing, pulling, turning? Was the task easy or demanding, slow or brisk, restful or laborious?

Very Low — Very High

**Temporal demand**
How much time pressure did you feel? Was the pace slow and leisurely or rapid and frantic?

Very Low — Very High

**Effort**
How hard did you work mentally and physically to accomplish your level of performance?

Very Low — Very High

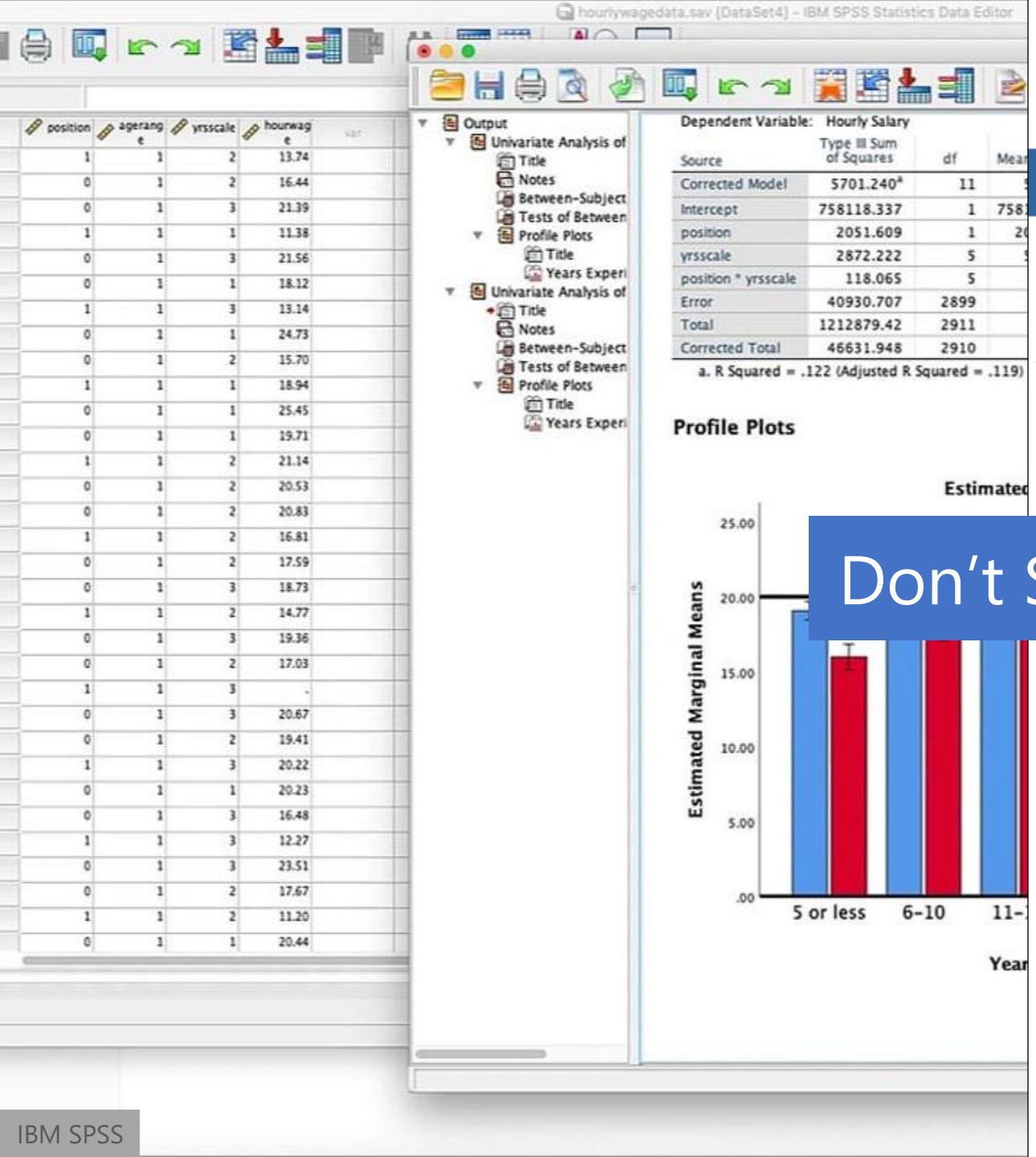
**Performance**
How successful did you feel in accomplishing the goals of the task? How satisfied were you with your performance?

Very Low — Very High

**Frustration level**
How discouraged, stressed, irritated, and annoyed versus gratified, content, and relaxed did you feel during the task?

Very Low — Very High

NASA-TLX (Task Load Index), Hart 88




Don't Stress!

IBM SPSS

Laerd statistics

Take the

# One-way ANOVA in SPSS Statistics

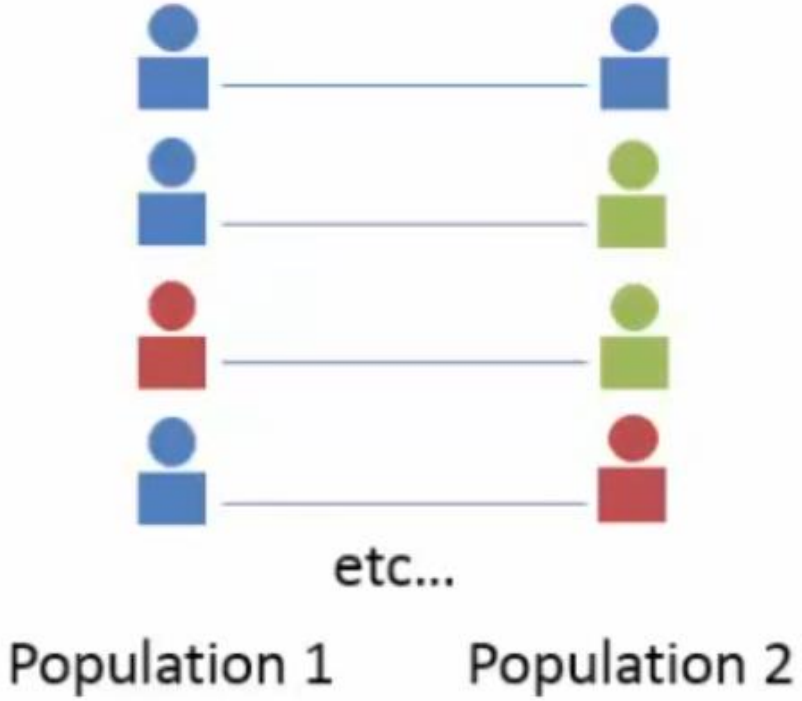
## Introduction

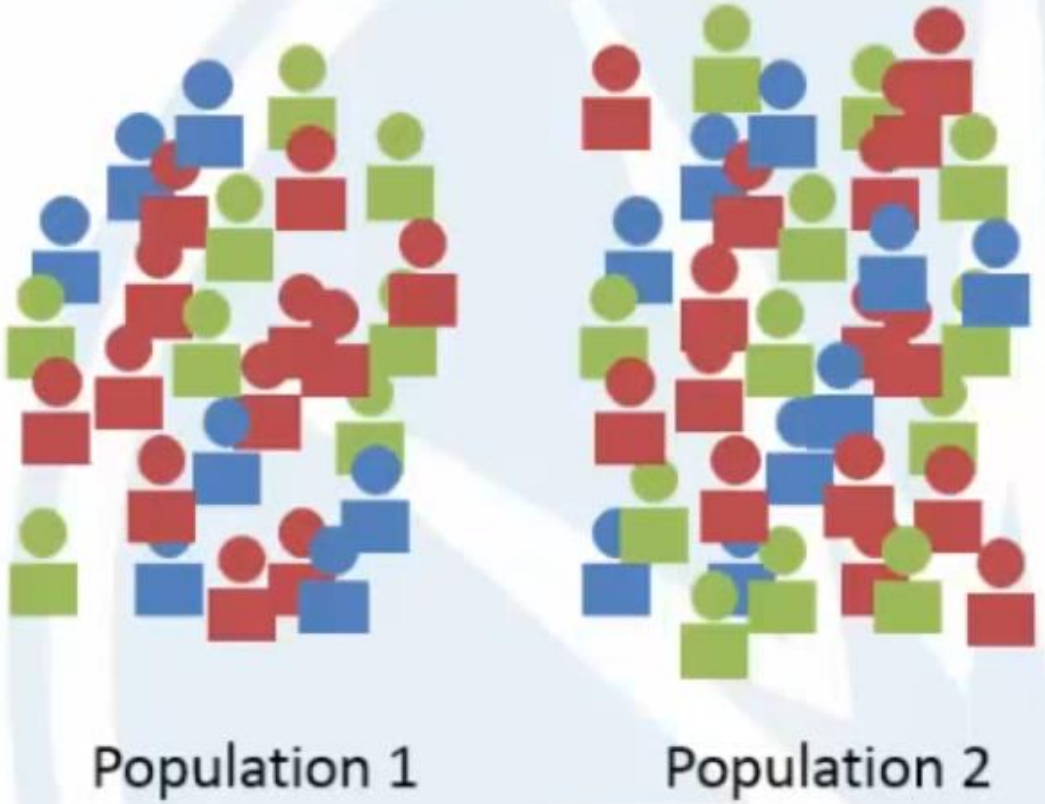
The one-way analysis of variance (ANOVA) is used to determine whether there are any sta
more independent (unrelated) groups (although you tend to only see it us
For example, you could use a one-way ANOVA to understand whether e
ongst students, dividing students into three independent groups (e.g., lov
is important to realize that the one-way ANOVA is an **omnibus** test statistic and cannot tell
significantly different from each other; it only tells you that at least two groups were differe
groups in your study design, determining which of these groups differ from each other is i
(N.B., we discuss post hoc tests later in this guide).

**Note:** If your study design not only involves one dependent variable and one independe
a "covariate") that you want to "statistically control", you may need to perform an ANCOV
thought of as an extension of the one-way ANOVA. To learn more, see our SPSS Statistic
dependent variable is the time until an event happens, you might need to run a Kaplan-M

This "quick start" guide shows you how to carry out a one-way ANOVA using SPSS Statisti
from this test. Since the one-way ANOVA is often followed up with a post hoc test, we also
using SPSS Statistics. However, before we introduce you to this proc

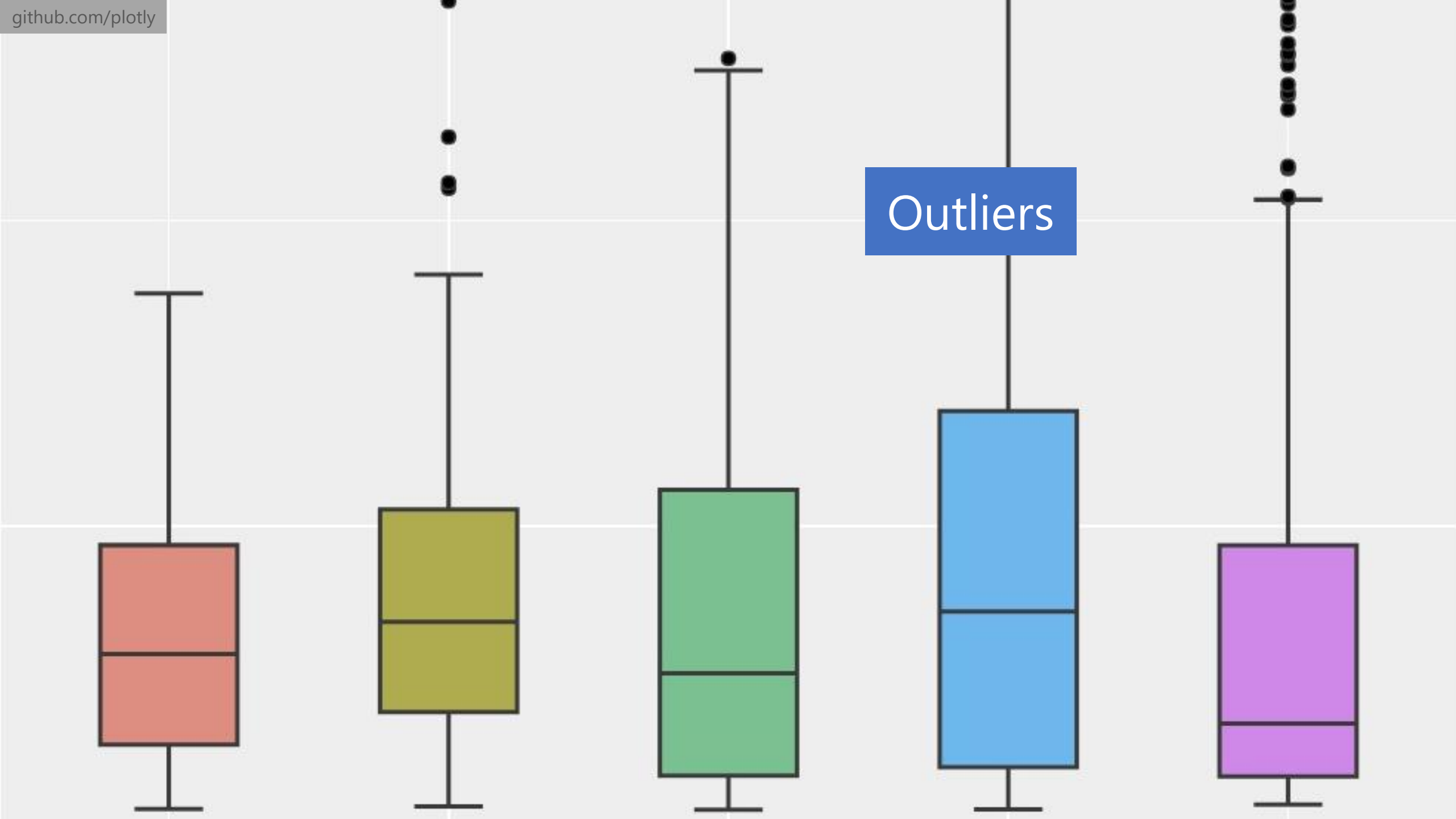
# Samples



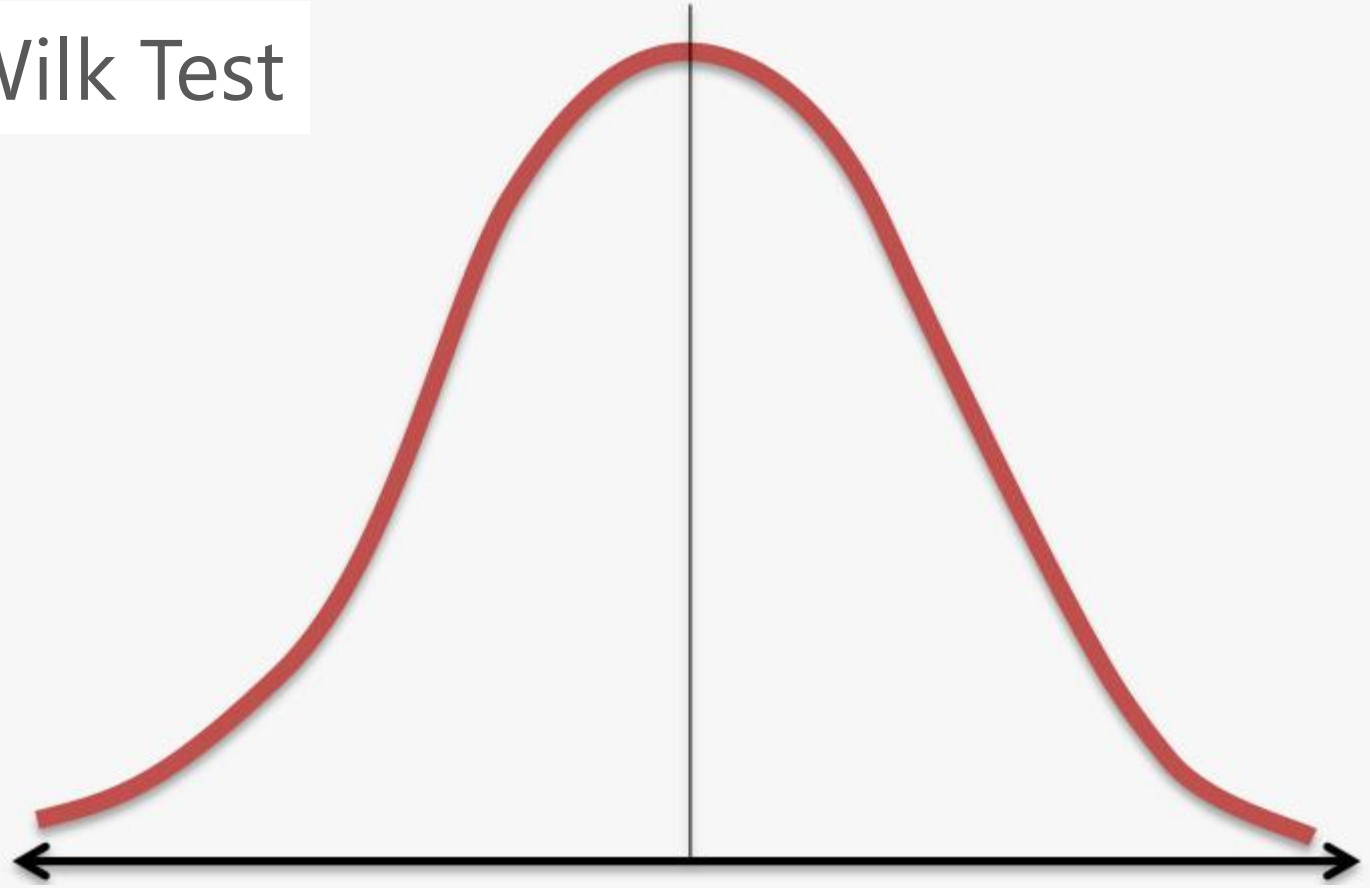

Related

Independent


github.com/plotly
Outliers

# Data Normality

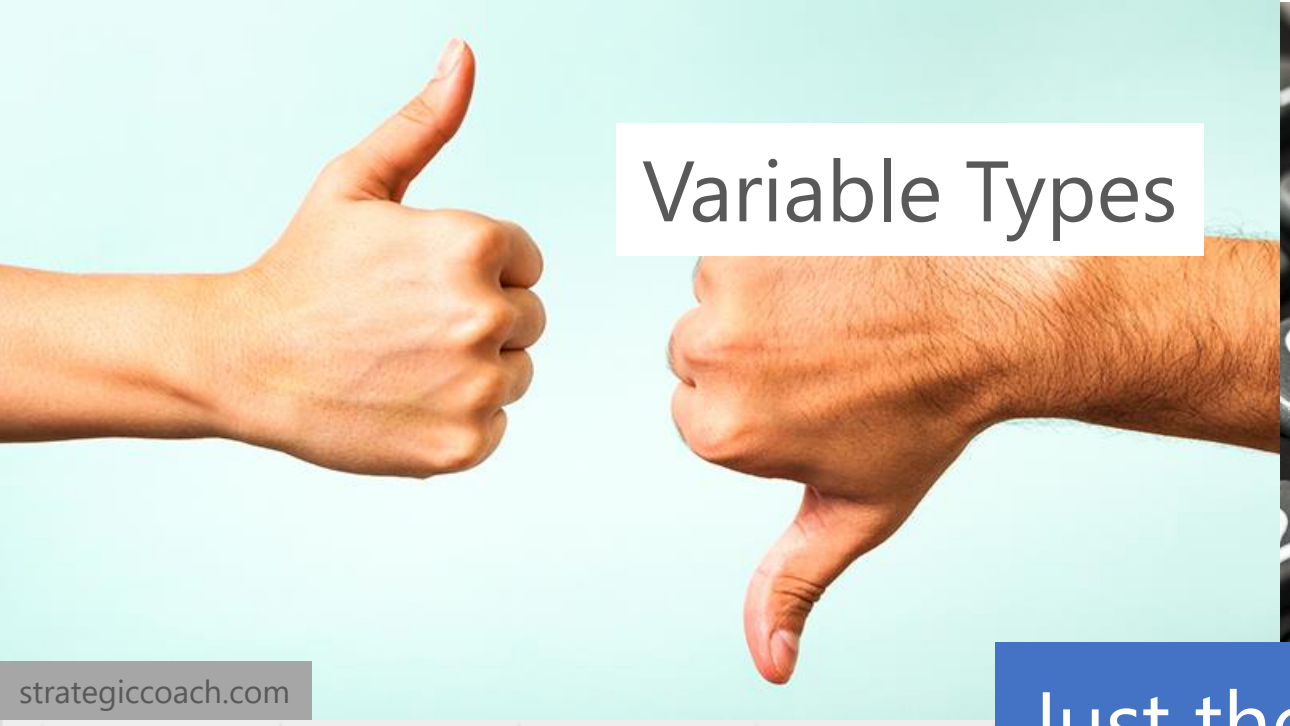
## Shapiro-Wilk Test



# Cheat Sheet

| Samples | | Data normality | |
|---|---|---|---|
| Type | Count | Yes | No |
| Related | 2 | Paired T-test | Wilcoxon Signed Ranks |
| | >2 | Repeated Measures ANOVA | Friedman |
| Independent | 2 | Student's T-test | Mann-Whitney U |
| | >2 | One-way ANOVA | Kruskal-Wallis |

When testing more than two samples, post-hoc test are required. Use them with the Bonferroni correction.



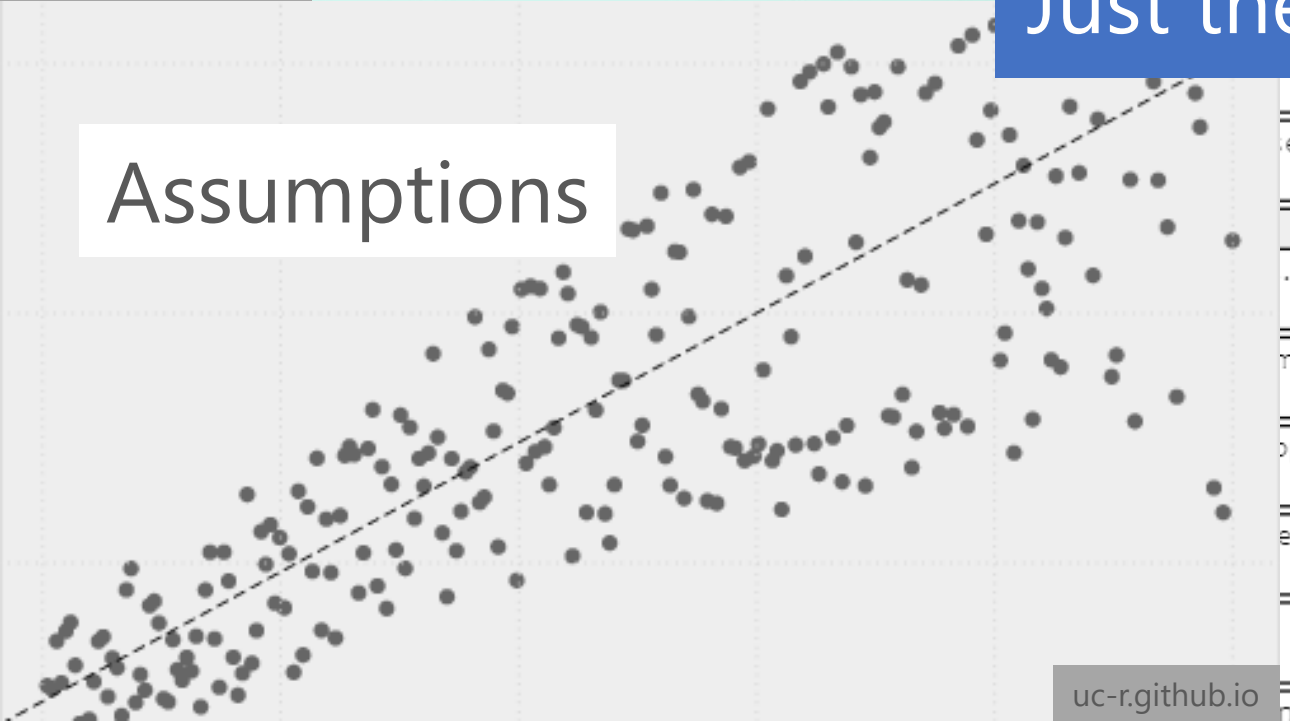
# Variable Types

strategiccoach.com

# More Tests

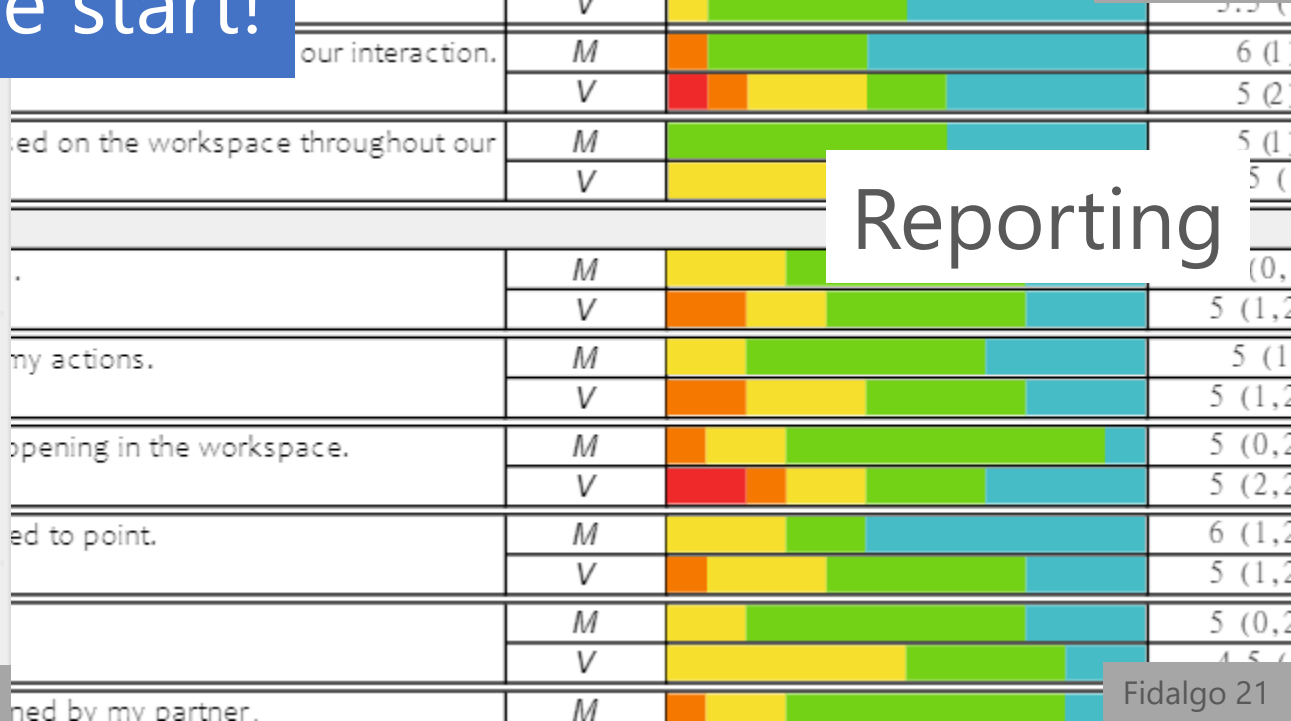
pexels.com

# Just the start!



# Assumptions

uc-r.github.io



# Reporting

# Questions?

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