UNIVERSITÄTSMEDIZIN GÖTTINGEN UMG

# Exercise list 01 - Descriptive statistics

Introduction to Statistics / Neuroscience 2023/2024

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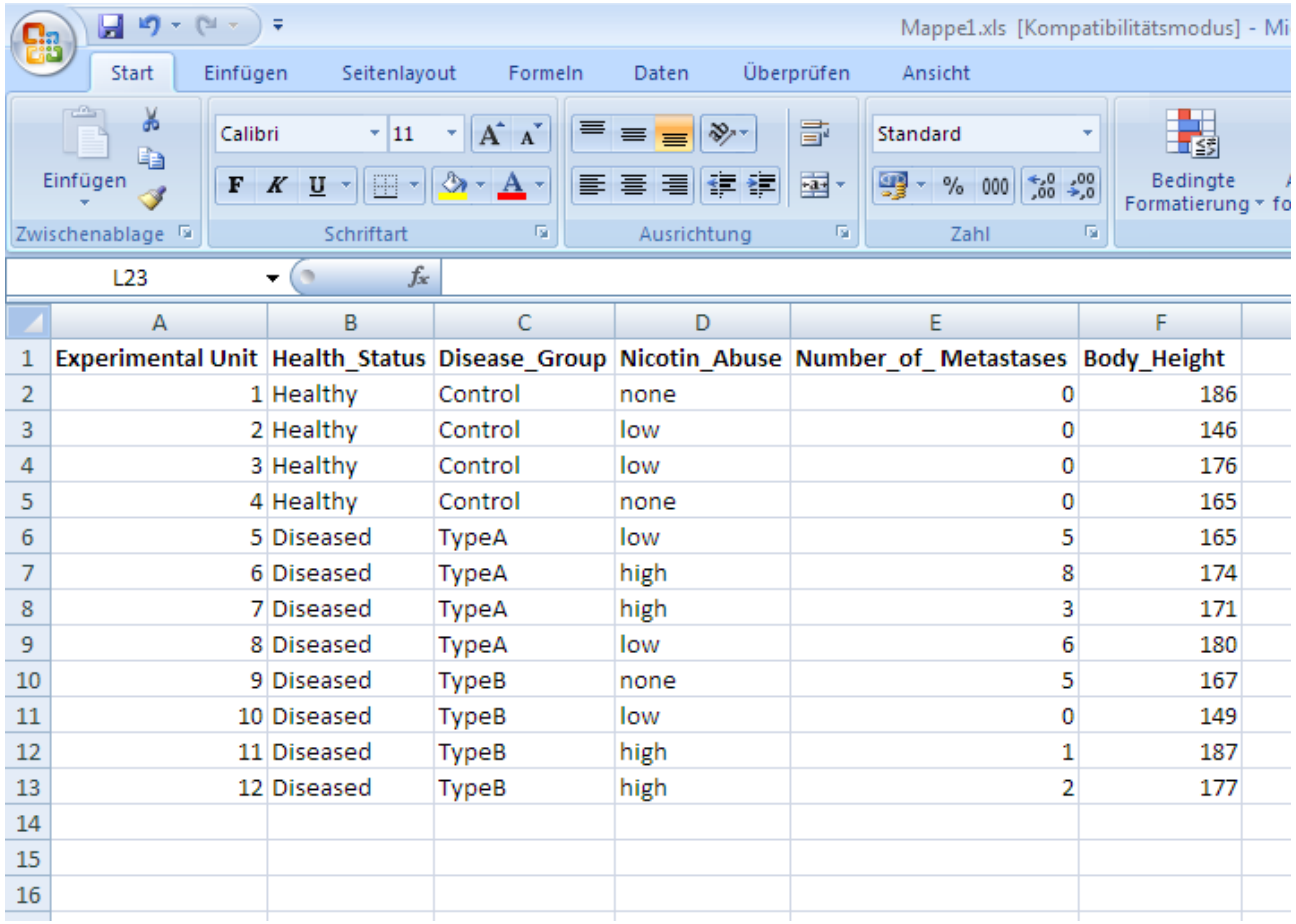
# Unit 1 1.Measurement Scales

- **5 minutes** to:
  - **Import** the following dataset to Jamovi (How? By **typing** it in!).
  - Assign ID as the **measure type** for Experimental Unit.
  - Assign the **measure** (and **data**) type for other variables accordingly.
    - 2 **Nominal** (**text**), 1 **ordinal** (**text**) and 2 **continuous** (**integer** or **decimal**).
  - **Save** it as a **.csv file** before the analysis.




| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Experimental Unit | Health_Status | Disease_Group | Nicotin_Abuse | Number_of_ Metastases | Body_Height |
| 2 | 1 | Healthy | Control | none | 0 | 186 |
| 3 | 2 | Healthy | Control | low | 0 | 146 |
| 4 | 3 | Healthy | Control | low | 0 | 176 |
| 5 | 4 | Healthy | Control | none | 0 | 165 |
| 6 | 5 | Diseased | TypeA | low | 5 | 165 |
| 7 | 6 | Diseased | TypeA | high | 8 | 174 |
| 8 | 7 | Diseased | TypeA | high | 3 | 171 |
| 9 | 8 | Diseased | TypeA | low | 6 | 180 |
| 10 | 9 | Diseased | TypeB | none | 5 | 167 |
| 11 | 10 | Diseased | TypeB | low | 0 | 149 |
| 12 | 11 | Diseased | TypeB | high | 1 | 187 |
| 13 | 12 | Diseased | TypeB | high | 2 | 177 |
| 14 | | | | | | |
| 15 | | | | | | |
| 16 | | | | | | |

# Unit 1 2. Characteristic Quantities (Qualitative/Nominal)

- **10 minutes** to:
  - **Find** the **absolute/relative** frequencies of the
    - **Dichotomous** variable,
    - **Categorical** variable,
    - **Ordinal** variable.

Binomial Test

| | Level | Count | Total | Proportion | p |
|---|---|---|---|---|---|
| Health_Status | Healthy | 4 | 12 | 0.333 | 0.388 |
| | Diseased | 8 | 12 | 0.667 | 0.388 |
| Disease_Group | Control | 4 | 12 | 0.333 | 0.388 |
| | TypeA | 4 | 12 | 0.333 | 0.388 |
| | TypeB | 4 | 12 | 0.333 | 0.388 |
| Nicotin_Abuse | none | 3 | 12 | 0.250 | 0.146 |
| | low | 5 | 12 | 0.417 | 0.774 |
| | high | 4 | 12 | 0.333 | 0.388 |

*Note*. $H_a$ is proportion ≠ 0.5

# Unit 1 2. Characteristic Quantities (Continuous)

- **5 minutes** to:
  - **Find** the measures of **location** for the
    - **Integer** variable,
    - **Decimal** variable.

- **5 minutes** to:
  - **Find** the measures of **dispersion**.

Descriptives

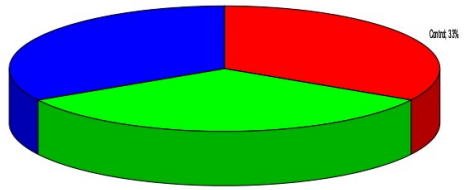
| | Body_Height | Number_of_Metastases |
|---|---|---|
| Mean | 170 | 2.50 |
| Median | 173 | 1.50 |
| Minimum | 146 | 0 |
| Maximum | 187 | 8 |

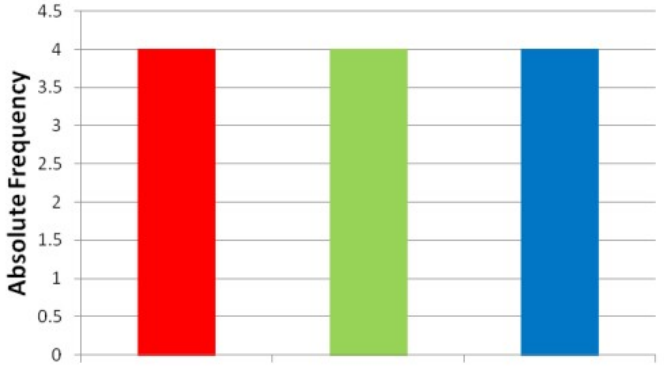
Descriptives

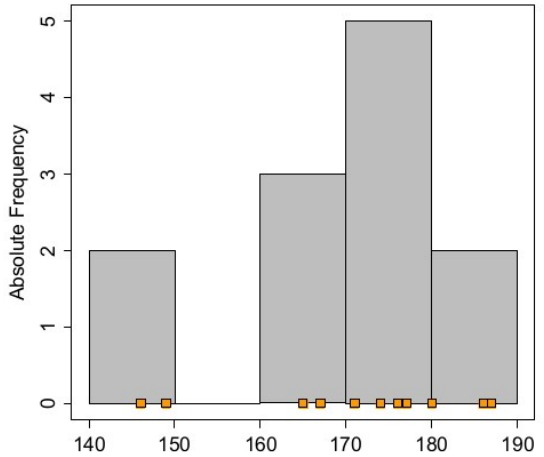
| | Body_Height | Number_of_Metastases |
|---|---|---|
| Standard deviation | 12.9 | 2.84 |
| Variance | 166 | 8.09 |
| IQR | 12.8 | 5.00 |
| Range | 41.0 | 8 |

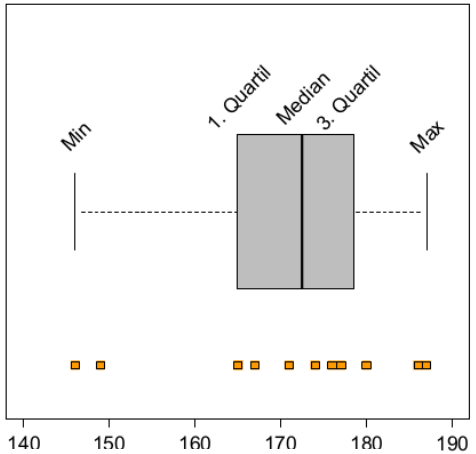
# Unit 1 3. Graphical representation

- **10 minutes** to:
  - Plot reasonable graphs with the 5 variables being
    - 1 **pie chart**,
    - 2 **bar charts**,
    - 1 **histogram**,
    - 1 **box-plot**.



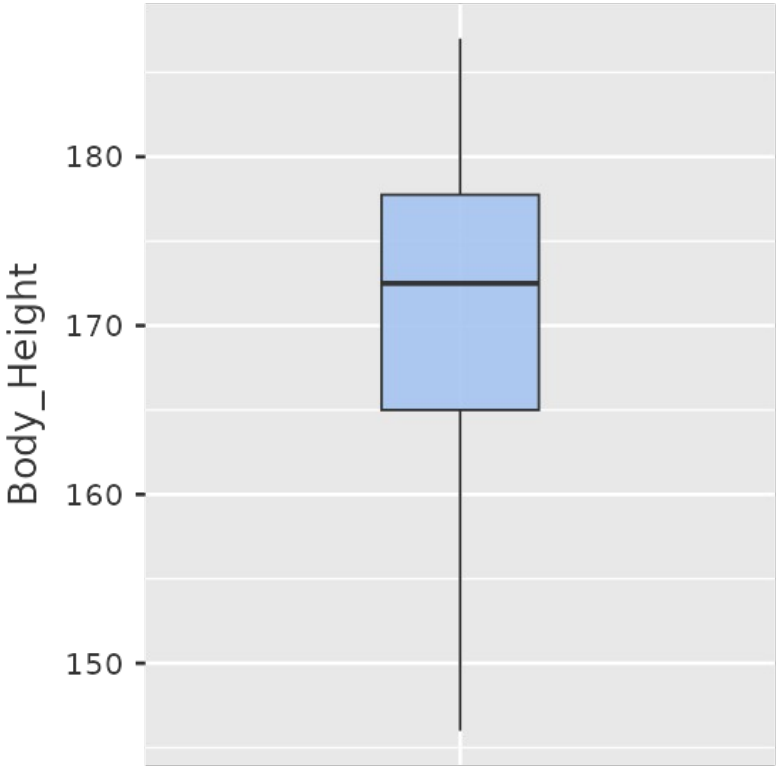


# Unit 1 3. Graphical representation (Continuous)

- **Let's interpret the results**:
  - What is the **IQR**?
  - Is there any Body Height **outlier** (relatively short/tall)?
  - What is roughly the **minimum** value in this dataset?
  - What is a **Whisker**? How to compute it?



# Unit 1 3. Graphical representation (Continuous)

- **Let's compare the results**:
  - What makes the two plots so **different**?
  - Jamovi's **bin width** (and) number is chosen automatically.