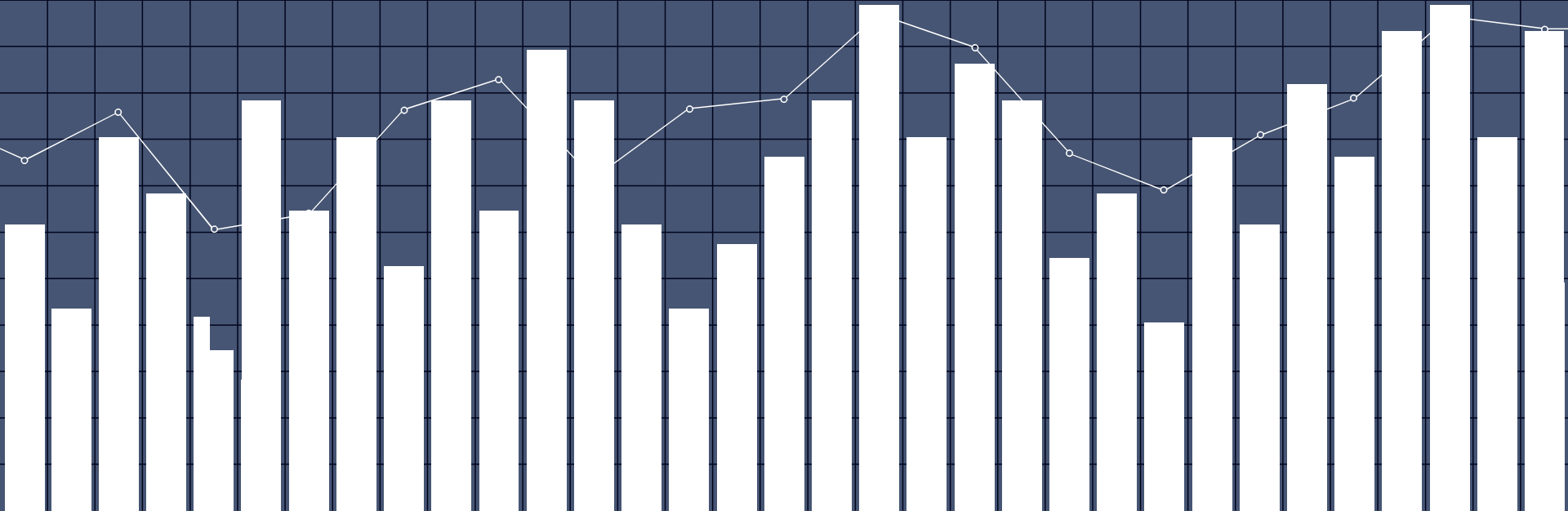
04. Čištění dat



Harmonogram

- 01. Rekapitulace
- 02. Explorace
- 03. Příprava pro analýzu
- 04. Chybějící a odlehlé hodnoty

Čištění dat

Explorace hrubých dat - base

```
# Matice
bmi_1 = read_excel("bmi.xlsx", sheet = 2)

# Check the class of bmi
class(bmi_1)

# Check the dimensions of bmi
dim(bmi_1)

# View the column names of bmi
colnames(bmi_1)

# Struktura dat
str(bmi_1)
```

```
# Glimpse
# install.packages("dplyr")
library(dplyr)
glimpse(bmi_1)

# Sumarizace
summary(bmi_1)

# Prvních 10 a posledních 10 řádků
head(bmi_1, n = 10)
tail(bmi_1, n = 10)
```

Čištění dat

Explorace hrubých dat - psych

```
# Load psych
install.packages("psych")
library(psych)

# Check the structure of bmi, the psych way
describe(bmi_1)
```

Čištění dat

Explorace hrubých dat - summarytools

```
# Load summarytools
install.packages("summarytools")
library(summarytools)

# Data
Manpower = read.csv("Manpower.csv")

# Check the structure of bmi, the psych way
view(dfSummary(Manpower))
```

Čištění dat

Příprava dat pro analýzu

```
# Matice
Infrastructure = read.csv2(“Infrastructure.csv“)

# Preview Infrastructure with str()
str(Infrastructure)

# Coerce Country to character
Infrastructure$Country <- as.character(Infrastructure$Country)

# Coerce Rank to factor
Infrastructure$Rank <- as.character(Infrastructure$Rank)

# Look at Infrastructure once more with str()
str(Infrastructure)
```

Čištění dat

Příprava dat pro analýzu – dílčí manipulace se strings

```
# Load the stringr package
install.packages("stringr")
library("stringr")

# Trim all leading and trailing whitespace
name = c(" Filip ", "Nick ", " Jonathan")
str_trim(name)

# Pad these strings with leading zeros
pad = c("23485W", "8823453Q", "994Z")
str_pad(pad, width = 9, side = "left", pad =
"0")
```

```
# Print state abbreviations
Manpower$Country

# Make states all uppercase and save result
# to states_upper
states_upper =
toupper(Manpower$Country)
states_upper

# Make states_upper all lowercase again
states_lower = tolower(Manpower$Country)
states_lower
```

Čištění dat

Příprava dat pro analýzu – dílčí manipulace se strings

```
# Look at the head of Infrastructure
head(Infrastructure)

# Detect all "Republic" in Country
str_detect(Infrastructure$Country,
"Republic")
```

```
# In the Country column, replace "Republic"
with "R"...

Infrastructure$Country <-
str_replace(Infrastructure$Country,
"Republic", "R")
```

Čištění dat

Příprava dat pro analýzu – chybějící data

- In R, represented as NA
- May appear in other forms
  - #N/A (Excel)
  - Single dot (SPSS, SAS)
  - Empty string
- Inf - "Infinite value" (indicative of outliers?)
  - 1/0
  - 1/0 + 1/0
  - 33333^33333
- NaN - "Not a number" (rethink a variable?)
  - 0/0
  - 1/0 - 1/0

- character: "treatment", "123", "A"
- numeric: 23.44, 120, NaN, Inf
- integer: 4L, 1123L
- factor: factor("Hello"), factor(8)
- logical: TRUE, FALSE, NA

Čištění dat

Příprava dat pro analýzu – chybějící data

```
name = c("Jerry", "Beth", "Rick", "Morty")
n_friends = c(NaN, NA, Inf, 2)
status = c("Listening to human music", "Happy Family", "Garage", "")
social_df = data.frame(cbind(name, n_friends, status))
```

```
# Call is.na() on the full social_df to spot all NAs
is.na(social_df)

# Use the any() function to ask whether there are any NAs
# in the data
any(is.na(social_df))

# View a summary() of the dataset
summary(social_df)

# Call table() on the status column
table(social_df$status)
```

```
# Replace all empty strings in status with NA
social_df$status[social_df$status == ""] <- NA

# Print social_df to the console
social_df

# Use complete.cases() to see which rows have no missing values
complete.cases(social_df)

# Use na.omit() to remove all rows with any missing values
na.omit(social_df)
```

Čištění dat

Odlehlé hodnoty – explorace grafy

```
# Matice
Infrastructure = read.csv2("Infrastructure.csv")

# Histogram
hist(Infrastructure$Ports)

# Boxplot
boxplot(Infrastructure$Airports)

# Scatterplot
plot(Infrastructure$Railway_Coverage, Infrastructure$Roadway_Coverage)
```