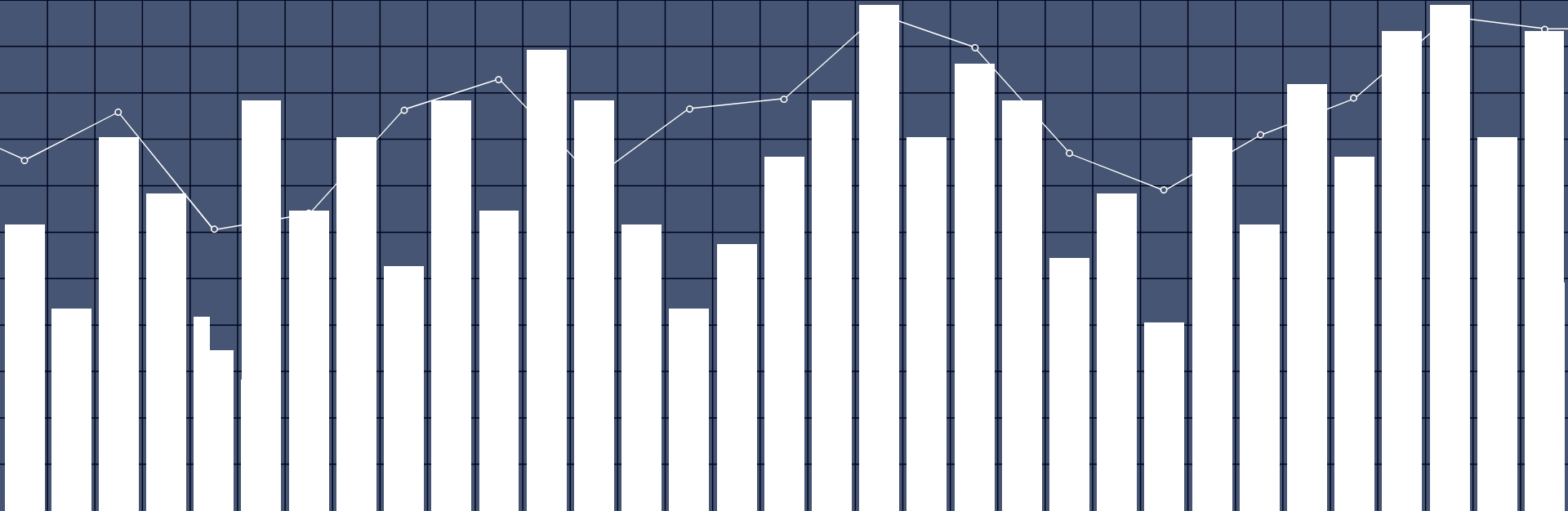
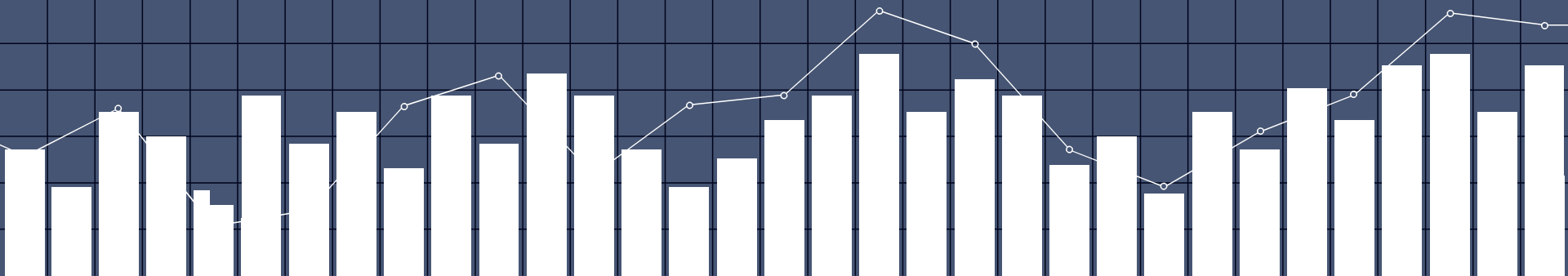
06. Explorace dat



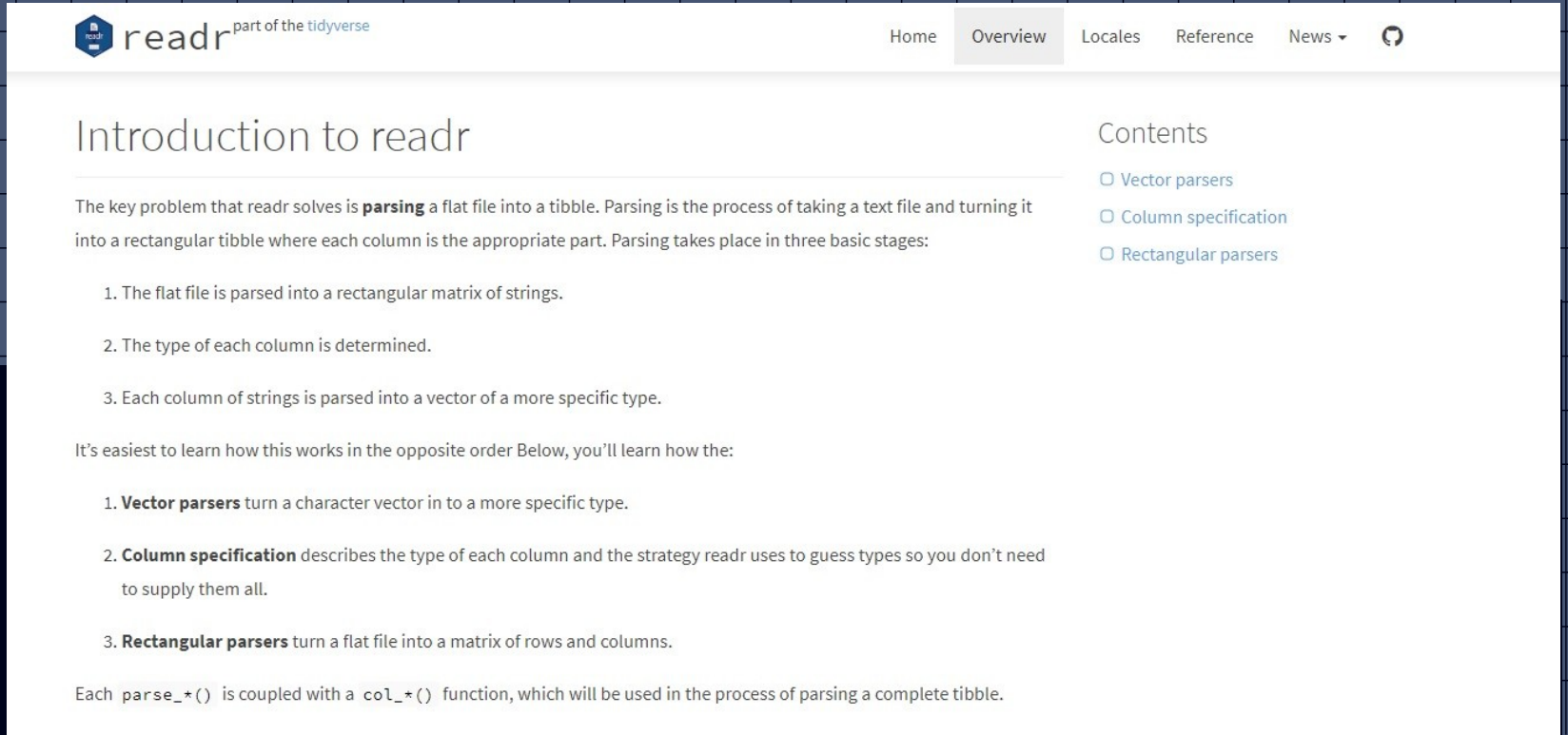
Harmonogram

- 01. Rekapitulace
- 02. Kategorická data
- 03. Numerická data



Rekapitulace

readr



readr part of the tidyverse

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Introduction to readr

The key problem that readr solves is **parsing** a flat file into a tibble. Parsing is the process of taking a text file and turning it into a rectangular tibble where each column is the appropriate part. Parsing takes place in three basic stages:

1. The flat file is parsed into a rectangular matrix of strings.
2. The type of each column is determined.
3. Each column of strings is parsed into a vector of a more specific type.

It's easiest to learn how this works in the opposite order Below, you'll learn how the:

1. **Vector parsers** turn a character vector in to a more specific type.
2. **Column specification** describes the type of each column and the strategy readr uses to guess types so you don't need to supply them all.
3. **Rectangular parsers** turn a flat file into a matrix of rows and columns.

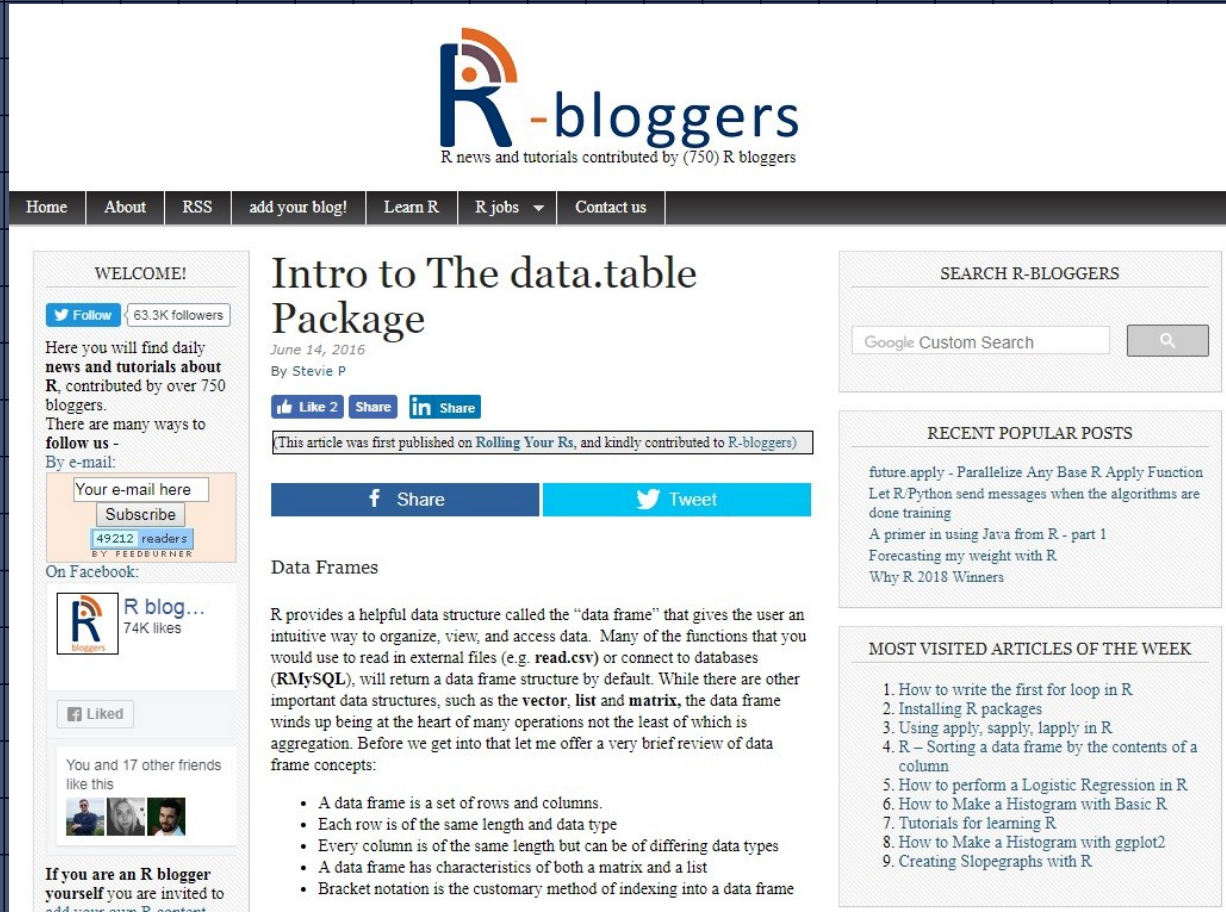
Each `parse_*()` is coupled with a `col_*()` function, which will be used in the process of parsing a complete tibble.

Contents

- Vector parsers
- Column specification
- Rectangular parsers

Rekapitulace

[data.table]



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June 14, 2016
By Stevie P

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(This article was first published on Rolling Your Rs, and kindly contributed to R-bloggers)

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Data Frames

R provides a helpful data structure called the "data frame" that gives the user an intuitive way to organize, view, and access data. Many of the functions that you would use to read in external files (e.g. **read.csv)** or connect to databases (**RMySQL**), will return a data frame structure by default. While there are other important data structures, such as the **vector**, **list** and **matrix,** the data frame winds up being at the heart of many operations not the least of which is aggregation. Before we get into that let me offer a very brief review of data frame concepts:

- A data frame is a set of rows and columns.
- Each row is of the same length and data type
- Every column is of the same length but can be of differing data types
- A data frame has characteristics of both a matrix and a list
- Bracket notation is the customary method of indexing into a data frame

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Rekapitulace

[styler]

Tidyverse

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styler 1.0.0

Photo by Heng Films

We're pleased to announce the release of styler 1.0.0. styler is a source code formatter - a package to format R code according to a style guide. It defaults to our implementation of the tidyverse style guide, but there is plenty of flexibility for a user to specify their own style. A coherent style is important for consistency and legibility. Just as it is important to putspcesbetweenwords. You can install styler from CRAN:

```
install.packages("styler")
```

styler can style text, single files, packages and entire R source trees with the following functions:

- `style_text()` styles a character vector.
- `style_file()` styles R and Rmd files.
- `style_dir()` styles all R and/or Rmd files in a directory.
- `style_pkg()` styles the source files of an R package.
- An RStudio Addin that styles the active R or Rmd file, the current package or the highlighted code.

Contents

Upcoming events

rstudio::conf 2019

Austin, TX
Jan 15-18

rstudio::conf 2019 covers all things RStudio, including workshops to teach you the tidyverse, and talks to show you the latest and greatest features.

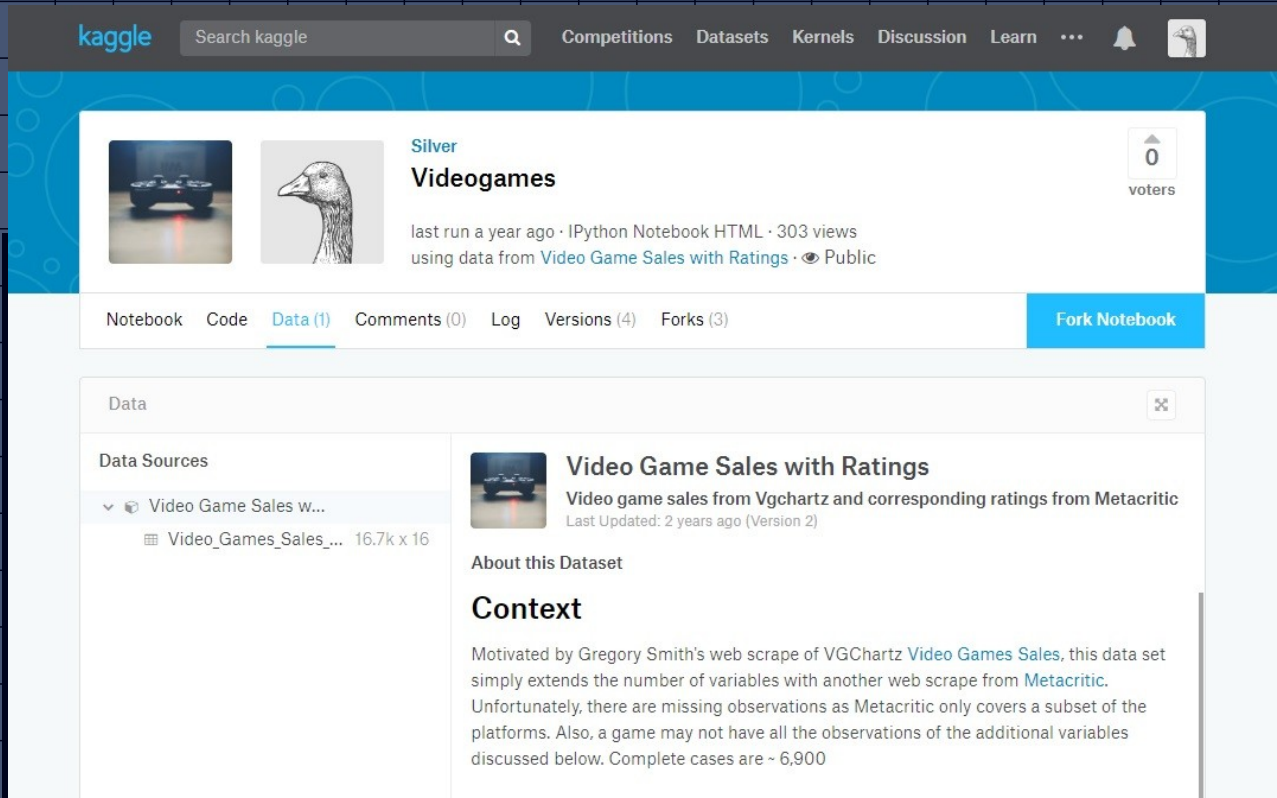
tidyverse developer day

Austin, TX
Jan 19

Help the tidyverse team improve our code and documentation. First-time contributors are welcome.

Dataset

[Videogames]



Kategorická data

Kontingenční tabulky

```
# Data
Videogames <- read_csv("Video_Games_Sales_as_at_22_Dec_2016.csv")
Videogames2 <- read.csv("Video_Games_Sales_as_at_22_Dec_2016.csv")

# Skrínink dat
view(dfSummary(Videogames))

# Kontingenční tabulka – absolutní četnosti
table(Videogames$Genre, Videogames$Rating)

# Kontingenční tabulka – hry pro všechny
Videogames_Everyone <- Videogames %>%
  filter(Rating == "E") %>%
  droplevels()
```

Kategorická data

Sloupcový graf

```
# Data
Videogames_Everyone_Teen <- Videogames %>%
  filter(Rating %in% c("E", "T"))%>%
  droplevels()

# Balíček
library(ggplot2)

# Sloupcový graf
ggplot(Videogames_Everyone_Teen, aes(x = Genre, fill = Rating)) +
  geom_bar(position = "dodge")

# Sloupcový graf s úpravou popisků
ggplot(Videogames_Everyone_Teen, aes(x = Genre, fill = Rating)) +
  geom_bar(position = "dodge") +
  theme(axis.text.x = element_text(angle = 90))
```

Kategorická data

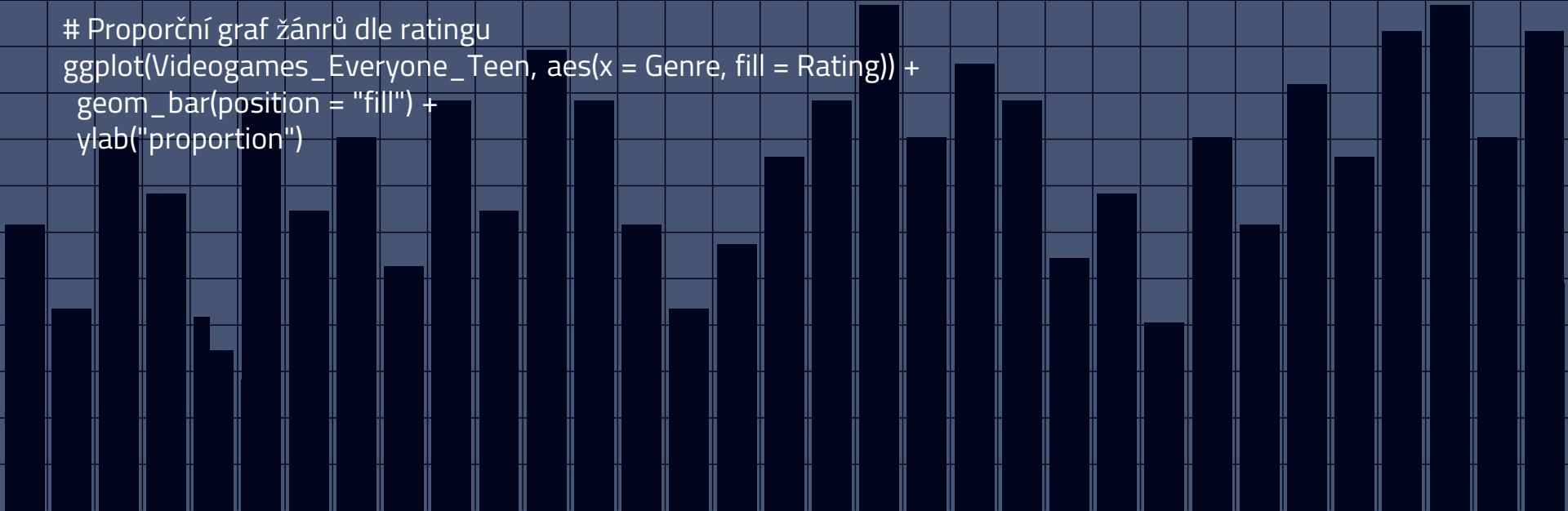
Kontingenční tabulky – relativní četnosti

```
# Tabulka s žánry a hodnocením
GenreRating = table(Videogames_Everyone_Teen$Genre, Videogames_Everyone_Teen$Rating)

# Celkové relativní četnosti
prop.table(GenreRating)

# Relativní četnosti pro řádky
prop.table(GenreRating, 1)

# Relativní četnosti pro sloupce
prop.table(GenreRating, 2)
```

Kategorická data

Sloupcový graf pro relativní četnosti

```
# Sloupcový graf žánrů dle ratingu
ggplot(Videogames_Everyone_Teen, aes(x = Genre, fill = Rating)) +
  geom_bar()

# Proporční graf žánrů dle ratingu
ggplot(Videogames_Everyone_Teen, aes(x = Genre, fill = Rating)) +
  geom_bar(position = "fill") +
  ylab("proportion")
```



Kategorická data

Sloupcový graf pro hodnoty právě jedné proměnné a sloupcový graf s tříděním

```
# Faktorizace proměnné Rating
Videogames_Everyone_Teen$Rating <- factor(Videogames_Everyone_Teen$Rating,
                levels = c("E", "T"), labels = c("Everyone", "Teen"))

# Sloupcový graf pro proměnnou Rating
ggplot(Videogames_Everyone_Teen, aes(x = Rating)) +
  geom_bar()

# Sloupcový graf pro proměnnou žánr dle proměnné Rating
ggplot(Videogames_Everyone_Teen, aes(x = Genre)) +
  geom_bar() +
  facet_wrap(~ Rating) +
  theme(axis.text.x = element_text(angle = 90))
```

Numerická data

Grafické zobrazení

```
# Histogram s facetami (vrstvami)
ggplot(Videogames_Everyone_Teen, aes(x = Critic_Score)) +
  geom_histogram() +
  facet_wrap(~ Rating)

# Filtrace her dle žánrů: střílečky, strategie a RPG
Shooter_Strategy_RPG <- filter(Videogames, Genre %in% c("Shooter", "Strategy", "Role-Playing"))

# Box plot
ggplot(Shooter_Strategy_RPG, aes(x = as.factor(Genre), y = Critic_Score)) +
  geom_boxplot()

# Density plot s překryvem kategorií
ggplot(Shooter_Strategy_RPG, aes(x = Critic_Score,
                                 fill = as.factor(Genre))) +
  geom_density(alpha = .3)
```

Numerická data

Grafické zobrazení

```
# Histogram počtu prodaných kusů her (v milionech) v EU
Videogames %>%
  ggplot(aes(x = EU_Sales)) +
  geom_histogram() +
  ggtitle("Počet prodaných kusů her (v milionech) v EU")

# Histogram počtu prodaných kusů her se sportovní tematikou (v milionech) v EU
Videogames %>%
  filter(Genre == "Sports") %>%
  ggplot(aes(x = EU_Sales)) +
  geom_histogram() +
  xlim(c(0, 3)) +
  ggtitle("Počet prodaných kusů sportovních her (v milionech) v EU")
```

Numerická data

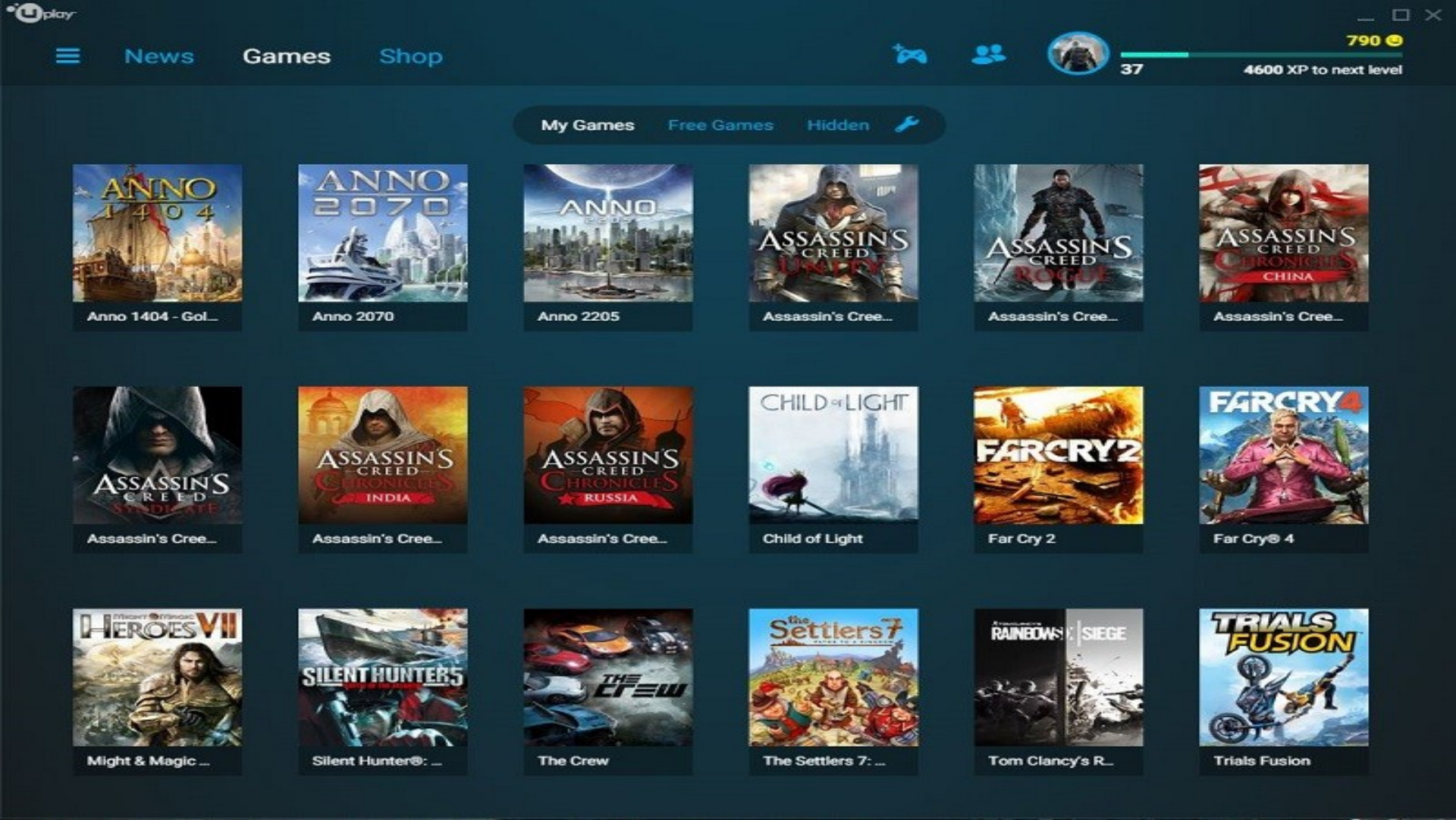
Grafické zobrazení

```
# Hodnocení her uživateli – šířka sloupce 30
Videogames %>%
  ggplot(aes(User_Score_Numeric)) +
  geom_histogram(binwidth = 30) +
  ggtitle("Hodnocení her uživateli")

# Hodnocení her uživateli – šířka sloupce 3
Videogames %>%
  ggplot(aes(User_Score_Numeric)) +
  geom_histogram(binwidth = 3) +
  ggtitle("Hodnocení her uživateli")

# Hodnocení her uživateli – šířka sloupce 10
Videogames %>%
  ggplot(aes(User_Score_Numeric)) +
  geom_histogram(binwidth = 10) +
  ggtitle("Hodnocení her uživateli")
```

Numerická data

Grafické zobrazení

```
# Boxplot počtu hodnotících uživatelů
Videogames %>%
  ggplot(aes(x = 1, y = User_Count)) +
  geom_boxplot()

# Vyřazení odlehlých hodnot
Videogames_no_out <- Videogames %>%
  filter(User_Count < 1000)

# Boxplot počtu hodnotících uživatelů bez odlehlých hodnot
Videogames_no_out %>%
  ggplot(aes(x = 1, y = User_Count)) +
  geom_boxplot()
```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Assassin's Cree...
Assassin's Cree...
Assassin's Cree...
Assassin's Cree...
Assassin's Cree...
Child of Light
Far Cry 2
Far Cry® 4
Might & Magic ...
Silent Hunter®: ...
The Crew
The Settlers 7: ...
Tom Clancy's R...
Trials Fusion

Numerická data

Sumarizace

```
# Data Ubisoftu
Ubisoft = filter(Videogames,
  ggplot(aes(x = 1, y = User_Count)) +
  geom_boxplot()

# Průměr a medián prodaných her (v milionech kusů) v Severní Americe Ubisoftu jako vydavatele dle žánru
Ubisoft %>%
  group_by(Genre) %>%
  summarize(mean(NA_Sales),
            median(NA_Sales))

# Boxplot prodaných her (v milionech kusů) Ubisoftu v Severní Americe jako vydavatele dle žánru
Ubisoft %>%
  ggplot(aes(x = Genre, y = NA_Sales)) +
  geom_boxplot()
```

Numerická data

Sumarizace

```
# Density plot pro nezměněné hodnoty
Ubisoft %>%
  ggplot(aes(x = NA_Sales)) +
  geom_density()

# Logaritmická transformace proměnné
Ubisoft <- Ubisoft %>%
  mutate(log_NA_Sales = log(NA_Sales))

# Density plot pro transformované hodnoty
Ubisoft %>%
  ggplot(aes(x = log_NA_Sales)) +
  geom_density()
```

Numerická data

Identifikace odlehlých hodnot

```
# Filtr pro akční hry od Ubisoftu, přidání proměnné indikující,  zda jde o odlehlou hodnotu
Ubisoft_Action <- Ubisoft %>%
  filter(Genre == "Action") %>%
  mutate(is_outlier = (NA_Sales < 1))

# Odstranění odlehlých hodnot z analýzy, vypracování boxplotu
Ubisoft_Action %>%
  filter(is_outlier == FALSE) %>%
  ggplot(aes(x = 1, y = NA_Sales)) +
  geom_boxplot()
```

Zdroje

Data Wrangling with dplyr and tidyr Cheat Sheet – https://www.rstudio.com/wp-content/uploads/2015/02/data-wrangling-cheatsheet.pdf