Visualització de dades. Pràctica 2.

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```
copy_vdem <- vdem %>%
  subset(year >= 1900 & year < 2024)
copy_vdem$region23 <- countrycode(copy_vdem$country_id, origin = "vdem",
                                  destination = "region23")
```

```
## Warning: Some values were not matched unambiguously: 23, 43, 128, 137, 209, 236
```

```
copy_vdem$region7 <- countrycode(copy_vdem$country_id, origin = "vdem",
                                 destination = "region")
```

```
## Warning: Some values were not matched unambiguously: 128, 209
```

```
unmatched_ids <- c( 23, 43, 128, 137, 209, 236)
unique(copy_vdem$country_name[copy_vdem$country_id %in% unmatched_ids])
```

```
## [1] "South Yemen"                "Kosovo"
## [3] "Palestine/West Bank"        "German Democratic Republic"
## [5] "Palestine/British Mandate"  "Zanzibar"
```

```
copy_vdem <- copy_vdem %>%
  mutate(region23 = case_when(
    country_name == "German Democratic Republic" ~ "Western Europe",
    country_name == "Zanzibar" ~ "Eastern Africa",
    country_name == "Kosovo" ~ "Southern Europe",
    country_name == "South Yemen" ~ "Western Asia",
    country_name == "Palestine/West Bank" ~ "Western Asia",
    country_name == "Palestine/British Mandate" ~ "Western Asia",
    TRUE ~ region23),
    region7 = case_when(
      country_name == "Palestine/West Bank" ~ "Middle East & North Africa",
      country_name == "Palestine/British Mandate" ~ "Middle East & North Africa",
```

```
      TRUE ~ region7)
    )
```

3. Getting the desired indices and indicators

```
df <- copy_vdem %>%
  select(country_name, country_id, region23, region7, year, v2x_regime,
         v2x_polyarchy, v2x_libdem, v2x_partipdem, v2x_delibdem, v2x_egaldem,
         v2x_freexp_altinf, v2x_frassoc_thick, v2x_suffr, v2x_liberal, v2xcl_rol,
         v2x_jucon, v2x_partip, v2x_cspart, v2xdl_delib, v2x_egal,
         v2xeg_eqprotec, v2xeg_eqaccess, v2xeg_eqdr,

         v2clacfree_ord, v2clacfree_osp, v2cldiscm_ord, v2cldiscm_osp,
         v2cldiscw_osp, v2cldiscw_ord, v2clgencl_ord, v2clgencl_osp,
         v2mecenefm_ord, v2mecenefm_osp, v2mebias_ord, v2mebias_osp,
         v2pepwrses_ord, v2pepwrses_osp, v2pepwrgen_ord, v2pepwrgen_osp,
         v2pepwrort_ord, v2pepwrort_osp, v2peedueq_ord, v2peedueq_osp,
         v2pehealth_ord, v2pehealth_osp, v2peapsecon_ord, v2peapsecon_osp,
         v2peasjsoecon_ord, v2peasjsoecon_osp, v2peapsgen_ord, v2peapsgen_osp,
         v2peasjgen_ord, v2peasjgen_osp) %>%
  subset(year > 1950 & year < 2024)
```

4. Dividing the dataset between indices and indicators

```
indices <- df %>%
  select(country_name, country_id, region23, region7, year, v2x_regime,
         v2x_polyarchy, v2x_libdem, v2x_partipdem, v2x_delibdem, v2x_egaldem,
         v2x_freexp_altinf, v2x_frassoc_thick, v2x_suffr, v2x_liberal, v2xcl_rol,
         v2x_jucon, v2x_partip, v2x_cspart, v2xdl_delib, v2x_egal,
         v2xeg_eqprotec, v2xeg_eqaccess, v2xeg_eqdr)

indicators_ord <- df %>%
  select(country_name, country_id, region23, region7, year, v2clacfree_ord,
         v2cldiscm_ord, v2cldiscw_ord, v2clgencl_ord, v2mecenefm_ord,
         v2mebias_ord, v2pepwrses_ord, v2pepwrgen_ord, v2pepwrort_ord,
         v2peedueq_ord, v2pehealth_ord, v2peapsecon_ord, v2peasjsoecon_ord,
         v2peapsgen_ord, v2peasjgen_ord)

indicators_osp <- df %>%
  select(country_name, country_id, region23, region7, year, v2clacfree_osp,
         v2cldiscm_osp, v2cldiscw_osp, v2clgencl_osp, v2mecenefm_osp,
         v2mebias_osp, v2pepwrses_osp, v2pepwrgen_osp, v2pepwrort_osp,
         v2peedueq_osp, v2pehealth_osp, v2peapsecon_osp, v2peasjsoecon_osp,
         v2peapsgen_osp, v2peasjgen_osp)
```

5. Preparing the data for visualizations

5.1. First visualization: The global map

Using the Liberal Democracy Index (v2x_libdem).

Liberal Democracy Index (LDI) combines the Electoral Democracy Index (EDI) with the liberal dimension: constraints on the executive by the legislature and the judiciary, and the rule of law ensuring respect for

civil liberties.

```
ldi <- indices %>%
  filter(year != 2024) %>%
  select(country_name, year, v2x_libdem) %>%
  pivot_wider(names_from = year, values_from = v2x_libdem)

# data for the first visualization:
write_xlsx(ldi, 'ldi_1950_2023.xlsx')
```

5.2. Second visualization: Democratization or autocratization?

Using the Regimes of the World index (v2x_regime).

This classifies the polical regime of a country as:

- 3: Liberal Democracy
- 2: Electoral Democracy
- 1: Electoral Autocracy
- 0: Closed Autocracy

```
regime <- copy_vdem %>%
  select(country_name, country_id, region23, region7, year, v2x_regime) %>%
  filter(year < 2024) %>%
  group_by(country_name) %>%
  mutate(Difference = v2x_regime - lag(v2x_regime, n=1)) %>%
  ungroup() %>%
  mutate(Process = case_when(
    Difference < 0 ~ "Autocratization",
    Difference > 0 ~ "Democratization",
    Difference == 0 ~ NA)
    )

regime_aut <- regime %>%
  filter(Process == "Autocratization") %>%
  group_by(year) %>%
  summarize(counts_autocratization = n(), .groups = "drop")

regime_dem <- regime %>%
  filter(Process == "Democratization") %>%
  group_by(year) %>%
  summarize(counts_democratization = n(), .groups = "drop")

regime_per_year <- full_join(regime_aut, regime_dem, by = "year") %>%
  arrange(year)

# write_xlsx(regime_per_year, 'regime_per_year.xlsx')
```

```
# 1) pivoting the data longer
regime_long <- regime_per_year %>%
  pivot_longer(
    cols = c(counts_democratization, counts_autocratization),
    names_to = "Process",
    values_to = "Count"
  ) %>%
  mutate(Process = case_when(
```

```
    Process == "counts_democratization" ~ "Democratization",
    Process == "counts_autocratization" ~ "Autocratization"
  ))

# 2) pivoting the data wider, using year as column names
regime_pivoted <- regime_long %>%
  pivot_wider(
    names_from = year,
    values_from = Count
  )
regime_pivoted[is.na(regime_pivoted)] <- 0

# data for the second visualization:
write_xlsx(regime_pivoted, 'regime_per_year_pivoted.xlsx')
```

5.3. Third visualization: The Evolution of Political Regime Types

```
regime_types_per_year <- regime %>%
  select(year, v2x_regime) %>%
  mutate(regime_type = case_when(
    v2x_regime == 0 ~ "Closed autocracy",
    v2x_regime == 1 ~ "Electoral autocracy",
    v2x_regime == 2 ~ "Electoral democracy",
    v2x_regime == 3 ~ "Liberal democracy"
  )) %>%
  group_by(year, regime_type) %>%
  summarize(count = n(), .groups = "drop") %>%
  pivot_wider(
    names_from = regime_type,
    values_from = count,
    names_prefix = "count_"
  ) %>%
  arrange(year) %>%
  select(-count_NA)


regime_types_wide <- regime_types_per_year %>%
  pivot_longer(!year, names_to = "regime_type", values_to = "count") %>%
  pivot_wider(names_from = year, values_from = count) %>%
  mutate(regime_type = case_when(
    regime_type == "count_Closed autocracy" ~ "Closed autocracy",
    regime_type == "count_Electoral autocracy" ~ "Electoral autocracy",
    regime_type == "count_Electoral democracy" ~ "Electoral democracy",
    regime_type == "count_Liberal democracy" ~ "Liberal democracy")) %>%
  rename("Regime type" = regime_type)

# write_xlsx(regime_types_per_year, 'regime_types_per_year.xlsx')

# data for the third visualization:
write_xlsx(regime_types_wide, 'regime_types_wide.xlsx')
```

5.4. Fourth visualization: Regime Classification by Country Population (Treemap)

```
clean_pop <- pop1dt %>%
  filter(year == 2023) %>%
  filter(country_code < 900) %>%
  rename(country_name = name) %>%
  select(country_name, pop) %>%
  mutate(country_name = case_when(
    country_name == "Bolivia (Plurinational State of)" ~    "Bolivia",
    country_name == "Cabo Verde" ~  "Cape Verde",
    country_name == "China, Hong Kong SAR" ~    "Hong Kong",
    country_name == "Iran (Islamic Republic of)" ~  "Iran",
    country_name == "Cote d'Ivoire" ~   "Ivory Coast",
    country_name == "Kosovo (under UNSC res. 1244)" ~   "Kosovo",
    country_name == "Lao People's Democratic Republic" ~    "Laos",
    country_name == "Republic of Moldova" ~ "Moldova",
    country_name == "Dem. People's Republic of Korea" ~ "North Korea",
    country_name == "Congo" ~   "Republic of the Congo",
    country_name == "Russian Federation" ~  "Russia",
    country_name == "Republic of Korea" ~   "South Korea",
    country_name == "Syrian Arab Republic" ~    "Syria",
    country_name == "China, Taiwan Province of China" ~ "Taiwan",
    country_name == "United Republic of Tanzania" ~ "Tanzania",
    country_name == "Gambia" ~  "The Gambia",
    country_name == "Venezuela (Bolivarian Republic of)" ~  "Venezuela",
    country_name == "Viet Nam"  ~ "Vietnam",
    TRUE ~ country_name))

treemap <- regime %>%
  filter(year == 2023) %>%
  mutate(regime_type = case_when(
    v2x_regime == 0 ~ "Closed autocracy",
    v2x_regime == 1 ~ "Electoral autocracy",
    v2x_regime == 2 ~ "Electoral democracy",
    v2x_regime == 3 ~ "Liberal democracy")) %>%
  select(-Difference, -Process, -v2x_regime, -year) %>%
  full_join(clean_pop, by = "country_name") %>%
  arrange(country_name) %>%
  select(-country_id) %>%
  drop_na()

# data for the fourth visualization:
write_xlsx(treemap, "treemap.xlsx")
```

5.5. Fifth and sixth visualizations: Who owns Democracy? (Part I and II)

5.5.1. Loading the downloaded and externally cleaned data of the Human Development Index

The external cleaning mainly focused on deleting unnecessary rows and renaming countries, as done in the previous step of this code.

```
hdi <- read_excel("HDI_cleaned.xlsx") %>%
  rename(country_name = Country)
```

```
clean_treemap <- treemap %>%
  select(country_name, regime_type)

ldi_vs_hdi <- ldi %>%
  select("country_name", "2023") %>%
  full_join(clean_pop, by = "country_name") %>%
  mutate(pop = pop*1000) %>%
  full_join(hdi, by = "country_name") %>%
  rename(Population = pop,
         LDI = "2023") %>%
  drop_na() %>%
  mutate(Human_Development = factor(Human_Development,
                                    levels = c("Very high human development",
                                               "High human development",
                                               "Medium human development",
                                               "Low human development"))) %>%
  full_join(clean_treemap, by = "country_name") %>%
  rename(Country = country_name) %>%
  arrange(Human_Development)

# data for visualizations fifth and sixth:
write_xlsx(ldi_vs_hdi, "ldi_vs_hdi.xlsx")
```

5.5.2. Preparing the data for the visualizations

5.6. The seventh visualization: Far-right, far less rights (radar plots)

Indices used for comparison: - Egalitarian component index (v2x_egal): broad equity across society - Equal protection index (v2xeg_eqprotec): legal protection for all - Equal access index (v2xeg_eqaccess): political access to all - Freedom of Expression and Alternative Sources of Information index (v2x_freexp_altinf): free speech and media - Liberal component index (v2x_liberal): checks on executive power - Equality before the law and individual liberty index (v2xcl_rol): rule of law and civil liberties

Countries that recently shifted to far-right governments: - Italy - Netherlands - Finland - Sweden

```
target_years <- c(2004, 2024)
target_countries <- c("Italy", "Netherlands", "Finland", "Sweden")

to_radar_chart <- vdem %>%
  filter(year %in% target_years) %>%
  filter(country_name %in% target_countries) %>%
  select(country_name, year, v2x_egal, v2xeg_eqprotec, v2xeg_eqaccess,
         v2x_freexp_altinf, v2x_liberal, v2xcl_rol) %>%
  mutate(year = case_when(
    year == "2004" ~ "20 years ago",
    year == "2024" ~ "Now"
  ))

write_xlsx(to_radar_chart, "to_radar_chart.xlsx")
```

6. References

- Arel-Bundock, V., Enevoldsen, N., & Yetman, C. J. (2018). countrycode: An R package to convert country names and country codes. Journal of Open Source Software, 3(28), 848.

- Nord, Marina, David Altman, Fabio Angiolillo, Tiago Fernandes, Ana Good God, and Staffan I. Lindberg. 2025. Democracy Report 2025: 25 Years of Autocratization – Democracy Trumped? University of Gothenburg: V-Dem Institute.
- wpp2024
- Human Development Index (HDI)