

# Assignment 4, MSB 105, 2025

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## Pakker

```
library(tidyverse)
library(readxl)
library(restatapi)
library(DescTools)
library(ggrepel)
library(flextable)
library(modelr)
library(plm)
library(broom)
library(sandwich)
library(dplyr)
library(tidyr)
library(ggplot2)
```

## Toc.eurostat

```
# xml skal ha mer detaljert info
# toc_xml <- get_eurostat_toc()
# tekstversjonen har trolig nok info for vårt formål

toc_txt <- get_eurostat_toc(mode = "txt")
```

## GDP NUTS 3

```
gdp_tabs <- toc_txt |>
# Regex AND external to regex
  filter(
    str_detect(
      string = title,
      # For å matche både små og store bokstaver
      pattern = '[Gg] [Dd] [Pp] '
      # AND vha. &
    ) &
    str_detect(
      string = title,
      # For å matche både små og store bokstaver og
      # space eller ikke før 3
      pattern = '[Nn] [Uu] [Tt] [Ss]\\s*3'
    )
  ) |>
select(title, code)
```

```
gdp_tabs |>
  select(title, code) |>
  flextable() |>
  width(1, width = 3.5) |>
  width(2, width = 1.5)
```

title	code
Average annual population to calculate regional GDP data (thousand persons) by NUTS 3 region	nama_10r_3popgdp
Gross domestic product (GDP) at current market prices by NUTS 3 region	nama_10r_3gdp

```
# description nama_10r_3gdp
dsd_gdp <- get_eurostat_dsd("nama_10r_3gdp")
```

```
dsd_gdp |>
  filter(concept %in% c('freq', 'unit')) |>
  flextable() |>
```

```
width(j = 1, width = 1) |>
width(j = 2, width = 2) |>
width(j = 3, width = 2)
```

concept	code	name
freq	A	Annual
unit	MIO_EUR	Million euro
unit	EUR_HAB	Euro per inhabitant
unit	EUR_HAB_EU27_2020	Euro per inhabitant in percentage of the EU27 (from 2020) average
unit	MIO_NAC	Million units of national currency
unit	MIO_PPS_EU27_2020	Million purchasing power standards (PPS, EU27 from 2020)
unit	PPS_EU27_2020_HAB	Purchasing power standard (PPS, EU27 from 2020), per inhabitant
unit	PPS_HAB_EU27_2020	Purchasing power standard (PPS, EU27 from 2020), per inhabitant in percentage of the EU27 (from 2020) average

```
dsd_gdp |>
  filter(concept %in% c('geo')) |>
  head(n = 10) |>
  flextable() |>
  width(j = 1, width = 1) |>
  width(j = 2, width = 2) |>
  width(j = 3, width = 2)
```

concept	code	name
geo	EU27_2020	European Union - 27 countries (from 2020)
geo	BE	Belgium
geo	BE1	Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest
geo	BE10	Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest
geo	BE100	Arr. de Bruxelles-Capitale/Arr. Brussel-Hoofdstad
geo	BE2	Vlaams Gewest
geo	BE21	Prov. Antwerpen
geo	BE211	Arr. Antwerpen
geo	BE212	Arr. Mechelen
geo	BE213	Arr. Turnhout

```
# Gross domestic product (GDP) at current market prices by NUTS 3 regions
# id: nama_10r_3gdp
# Vi velger å hente samtlige soner for så å filtrere ut de få vi ikke trenger
gdp <- get_eurostat_data(
  id = "nama_10r_3gdp",
  filters = list(
    # neste linje viser hvordan vi kunne ha hentet ut data
    # for spesifiserte land
    # geo = c("AT", "DE", "DK", "FR"),
    nuts_level = "3",
    unit = "MIO_PPS_EU27_2020"
  ),
  exact_match = FALSE,
  date_filter = 2000:2023,
  stringsAsFactors = FALSE
) |>
mutate(
  gdp_n3 = 1000000 * values
) |>
```

```
select(-c(unit, values)) |>
# Vil bare ha NUTS 3 nivå (5 karakterer). Vil aggregere selv til NUTS2,
# NUTS1 og NUTSc
filter(str_length(geo) == 5) |>
as_tibble()
```

```
dim(gdp)
```

```
[1] 30058      3
```

```
gdp
```

```
# A tibble: 30,058 x 3
   geo   time   gdp_n3
   <chr> <chr>   <dbl>
1 AL011 2008   551130000
2 AL011 2009   582160000
3 AL011 2010   664070000
4 AL011 2011   631170000
5 AL011 2012   717600000
6 AL011 2013   696860000
7 AL011 2014   735600000
8 AL011 2015   788630000
9 AL011 2016   801980000
10 AL011 2017   800660000
# i 30,048 more rows
```

```
gdp |>
  filter(geo == "IE053") |>
  print(n = 25)
```

```
# A tibble: 21 x 3
   geo   time   gdp_n3
   <chr> <chr>   <dbl>
1 IE053 2000   15837300000
2 IE053 2001   17506250000
3 IE053 2002   19395440000
4 IE053 2003   19687190000
5 IE053 2004   21000450000
6 IE053 2005   21776750000
```

```

7 IE053 2006 24081640000
8 IE053 2007 26086890000
9 IE053 2008 22705550000
10 IE053 2009 24012370000
11 IE053 2010 24085200000
12 IE053 2011 26235110000
13 IE053 2012 24346250000
14 IE053 2013 23345250000
15 IE053 2014 25127580000
16 IE053 2018 73687140000
17 IE053 2019 71965850000
18 IE053 2020 75581570000
19 IE053 2021 99064470000
20 IE053 2022 122163400000
21 IE053 2023 103989840000

```

```

ie_data <- tibble(
  geo = c("IE053", "IE053", "IE053"),
  time = c("2015", "2016", "2017"),
  gdp_n3 = c(NA, NA, NA)
)

```

```

gdp <- rbind(gdp, ie_data)

```

```

gdp <- gdp |>
  arrange(geo, time) |>
  mutate(
    gdp_n3 = zoo::na.approx(gdp_n3)
  )

```

```

gdp |>
  filter(geo == "IE053") |>
  print(n = 25)

```

```

# A tibble: 24 x 3
  geo   time      gdp_n3
  <chr> <chr>      <dbl>
1 IE053 2000  15837300000
2 IE053 2001  17506250000
3 IE053 2002  19395440000
4 IE053 2003  19687190000

```

5	IE053	2004	21000450000
6	IE053	2005	21776750000
7	IE053	2006	24081640000
8	IE053	2007	26086890000
9	IE053	2008	22705550000
10	IE053	2009	24012370000
11	IE053	2010	24085200000
12	IE053	2011	26235110000
13	IE053	2012	24346250000
14	IE053	2013	23345250000
15	IE053	2014	25127580000
16	IE053	2015	37267470000
17	IE053	2016	49407360000
18	IE053	2017	61547250000
19	IE053	2018	73687140000
20	IE053	2019	71965850000
21	IE053	2020	75581570000
22	IE053	2021	99064470000
23	IE053	2022	122163400000
24	IE053	2023	103989840000

## Population

### Oppgave 1

```
# Søk i toc_txt etter tabeller som inneholder både population og NUTS 3
# Vi bruker regexp for å dekke både små og store bokstaver og ulike skrivemåter

pop_tabs <- toc_txt |>
  filter(
    str_detect(
      string = title,
      pattern = "[Pp]opulation"
    ) &
    str_detect(
      string = title,
      pattern = "[Nn] [Uu] [Tt] [Ss]\\s*3"
    )
  ) |>
  select(title, code)
```

```
pop_tabs |>
  flextable() |>
  width(1, width = 5) |>
  width(2, width = 2)
```

title	code
Population density by NUTS 3 region	demo_r_d3dens
Population on 1 January by age group, sex and NUTS 3 region	demo_r_pjangrp3
Population on 1 January by broad age group, sex and NUTS 3 region	demo_r_pjanaggr3
Population structure indicators by NUTS 3 region	demo_r_pjanind3
Population change - Demographic balance and crude rates at regional level (NUTS 3)	demo_r_gind3
Population by single year of age and NUTS 3 region	cens_11ag_r3
Population by marital status and NUTS 3 region	cens_11ms_r3
Population by family status and NUTS 3 region	cens_11fs_r3
Population by sex, citizenship and NUTS 3 region	cens_01rscztz
Population by sex, age group, current activity status and NUTS 3 region	cens_01rapop
Total and active population by sex, age, employment status, residence one year prior to the census and NUTS 3 region	cens_01ramigr
Population by sex, age group, educational attainment level, current activity status and NUTS 3 region	cens_01rews
Population by sex, age group, household status and NUTS 3 region	cens_01rhtype
Population by sex, age group, size of household and NUTS 3 region	cens_01rhsize
Average annual population to calculate regional GDP data (thousand persons) by NUTS 3 region	nama_10r_3popgdp
Population by country of citizenship, age groups and NUTS 3 region	cens_21ctz_r3
Population by country of citizenship, age groups, family status and NUTS 3 region	cens_21ctzf_r3
Population by country of citizenship, age groups, type of housing arrangements and NUTS 3 region	cens_21ctzha_r3
Population by country of birth, age groups and NUTS 3 region	cens_21cob_r3



title	code
Population by country of birth, age groups, household status and NUTS 3 region	cens_21cobhs_r3
Population by country of birth, age groups, type of housing arrangements and NUTS 3 region	cens_21cobha_r3
Population by marital status, broad age groups and NUTS 3 region	cens_21m_r3
Population by family status, broad age groups and NUTS 3 region	cens_21f_r3
Population by size of the locality, age groups and NUTS 3 region	cens_21l_r3
Population by size of the locality, housing arrangements and NUTS 3 region	cens_21lha_r3
Population by year of arrival in the country since 2010, age groups, groups of country of birth and NUTS 3 region	cens_21argc_r3
Population by year of arrival in the country, age groups, family status and NUTS 3 region	cens_21arf_r3
Population with Ukrainian citizenship by 5-year age group and NUTS 3 region	cens_21ua_a5r3
Population with Ukrainian citizenship by age and NUTS 3 region	cens_21ua_ar3
Population with Ukrainian citizenship by 5-year age group, marital status and NUTS 3 region	cens_21ua_msr3
Population on 1st January by age, sex, type of projection and NUTS 3 region	proj_19rp3

## Oppgave 2

```
# Last ned Data Structure Definition (DSD) for nama_10r_3popgdp
```

```
dsd_pop <- get_eurostat_dsd("nama_10r_3popgdp")
```

```
dsd_pop |>
  filter(concept %in% c("freq", "unit", "geo")) |>
  flextable() |>
  width(j = 1, width = 1) |>
  width(j = 2, width = 2) |>
  width(j = 3, width = 2)
```

concept	code	name
freq	A	Annual
unit	THS	Thousand
geo	EU27_2020	European Union - 27 countries (from 2020)
geo	BE	Belgium
geo	BE1	Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest
geo	BE10	Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest
geo	BE100	Arr. de Bruxelles-Capitale/Arr. Brussel-Hoofdstad
geo	BE2	Vlaams Gewest
geo	BE21	Prov. Antwerpen
geo	BE211	Arr. Antwerpen
geo	BE212	Arr. Mechelen
geo	BE213	Arr. Turnhout
geo	BE22	Prov. Limburg (BE)
geo	BE223	Arr. Tongeren
geo	BE224	Arr. Hasselt
geo	BE225	Arr. Maaseik
geo	BE23	Prov. Oost-Vlaanderen
geo	BE231	Arr. Aalst
geo	BE232	Arr. Dendermonde
geo	BE233	Arr. Eeklo
geo	BE234	Arr. Gent
geo	BE235	Arr. Oudenaarde
geo	BE236	Arr. Sint-Niklaas

concept	code	name
geo	BE24	Prov. Vlaams-Brabant
geo	BE241	Arr. Halle-Vilvoorde
geo	BE242	Arr. Leuven
geo	BE25	Prov. West-Vlaanderen
geo	BE251	Arr. Brugge
geo	BE252	Arr. Diksmuide
geo	BE253	Arr. Ieper
geo	BE254	Arr. Kortrijk
geo	BE255	Arr. Oostende
geo	BE256	Arr. Roeselare
geo	BE257	Arr. Tielt
geo	BE258	Arr. Veurne
geo	BE3	Région wallonne
geo	BE31	Prov. Brabant wallon
geo	BE310	Arr. Nivelles
geo	BE32	Prov. Hainaut
geo	BE323	Arr. Mons
geo	BE328	Arr. Tournai-Mouscron
geo	BE329	Arr. La Louvière
geo	BE32A	Arr. Ath
geo	BE32B	Arr. Charleroi
geo	BE32C	Arr. Soignies
geo	BE32D	Arr. Thuin
geo	BE33	Prov. Liège
geo	BE331	Arr. Huy
geo	BE332	Arr. Liège
geo	BE334	Arr. Waremme

concept	code	name
geo	BE335	Arr. Verviers — communes francophones
geo	BE336	Bezirk Verviers — Deutschsprachige Gemeinschaft
geo	BE34	Prov. Luxembourg (BE)
geo	BE341	Arr. Arlon
geo	BE342	Arr. Bastogne
geo	BE343	Arr. Marche-en-Famenne
geo	BE344	Arr. Neufchâteau
geo	BE345	Arr. Virton
geo	BE35	Prov. Namur
geo	BE351	Arr. Dinant
geo	BE352	Arr. Namur
geo	BE353	Arr. Philippeville
geo	BG	Bulgaria
geo	BG3	Severna i Yugoiztochna Bulgaria
geo	BG31	Severozapaden
geo	BG311	Vidin
geo	BG312	Montana
geo	BG313	Vratsa
geo	BG314	Pleven
geo	BG315	Lovech
geo	BG32	Severen tsentralen
geo	BG321	Veliko Tarnovo
geo	BG322	Gabrovo
geo	BG323	Ruse
geo	BG324	Razgrad

concept	code	name
geo	BG325	Silistra
geo	BG33	Severoiztochen
geo	BG331	Varna
geo	BG332	Dobrich
geo	BG333	Shumen
geo	BG334	Targovishte
geo	BG34	Yugoiztochen
geo	BG341	Burgas
geo	BG342	Sliven
geo	BG343	Yambol
geo	BG344	Stara Zagora
geo	BG4	Yugozapadna i Yuzhna tsentralna Bulgaria
geo	BG41	Yugozapaden
geo	BG411	Sofia (stolitsa)
geo	BG412	Sofia
geo	BG413	Blagoevgrad
geo	BG414	Pernik
geo	BG415	Kyustendil
geo	BG42	Yuzhen tsentralen
geo	BG421	Plovdiv
geo	BG422	Haskovo
geo	BG423	Pazardzhik
geo	BG424	Smolyan
geo	BG425	Kardzhali
geo	CZ	Czechia
geo	CZ0	Česko
geo	CZ01	Praha

concept	code	name
geo	CZ010	Hlavní město Praha
geo	CZ02	Střední Čechy
geo	CZ020	Středočeský kraj
geo	CZ03	Jihozápad
geo	CZ031	Jihočeský kraj
geo	CZ032	Plzeňský kraj
geo	CZ04	Severozápad
geo	CZ041	Karlovarský kraj
geo	CZ042	Ústecký kraj
geo	CZ05	Severovýchod
geo	CZ051	Liberecký kraj
geo	CZ052	Královéhradecký kraj
geo	CZ053	Pardubický kraj
geo	CZ06	Jihovýchod
geo	CZ063	Kraj Vysočina
geo	CZ064	Jihomoravský kraj
geo	CZ07	Střední Morava
geo	CZ071	Olomoucký kraj
geo	CZ072	Zlínský kraj
geo	CZ08	Moravskoslezsko
geo	CZ080	Moravskoslezský kraj
geo	DK	Denmark
geo	DK0	Danmark
geo	DK01	Hovedstaden
geo	DK011	Byen København
geo	DK012	Københavns omegn
geo	DK013	Nordsjælland

concept	code	name
geo	DK014	Bornholm
geo	DK02	Sjælland
geo	DK021	Østsjælland
geo	DK022	Vest- og Sydsjælland
geo	DK03	Syddanmark
geo	DK031	Fyn
geo	DK032	Sydjylland
geo	DK04	Midtjylland
geo	DK041	Vestjylland
geo	DK042	Østjylland
geo	DK05	Nordjylland
geo	DK050	Nordjylland
geo	DKZ	Extra-Regio NUTS 1
geo	DKZZ	Extra-Regio NUTS 2
geo	DKZZZ	Extra-Regio NUTS 3
geo	DE	Germany
geo	DE1	Baden-Württemberg
geo	DE11	Stuttgart
geo	DE111	Stuttgart, Stadtkreis
geo	DE112	Böblingen
geo	DE113	Esslingen
geo	DE114	Göppingen
geo	DE115	Ludwigsburg
geo	DE116	Rems-Murr-Kreis
geo	DE117	Heilbronn, Stadtkreis
geo	DE118	Heilbronn, Landkreis
geo	DE119	Hohenlohekreis

concept	code	name
geo	DE11A	Schwäbisch Hall
geo	DE11B	Main-Tauber-Kreis
geo	DE11C	Heidenheim
geo	DE11D	Ostalbkreis
geo	DE12	Karlsruhe
geo	DE121	Baden-Baden, Stadtkreis
geo	DE122	Karlsruhe, Stadtkreis
geo	DE123	Karlsruhe, Landkreis
geo	DE124	Rastatt
geo	DE125	Heidelberg, Stadtkreis
geo	DE126	Mannheim, Stadtkreis
geo	DE127	Neckar-Odenwald-Kreis
geo	DE128	Rhein-Neckar-Kreis
geo	DE129	Pforzheim, Stadtkreis
geo	DE12A	Calw
geo	DE12B	Enzkreis
geo	DE12C	Freudenstadt
geo	DE13	Freiburg
geo	DE131	Freiburg im Breisgau, Stadtkreis
geo	DE132	Breisgau-Hochschwarzwald
geo	DE133	Emmendingen
geo	DE134	Ortenaukreis
geo	DE135	Rottweil
geo	DE136	Schwarzwald-Baar-Kreis
geo	DE137	Tuttlingen
geo	DE138	Konstanz
geo	DE139	Lörrach



concept	code	name
geo	DE13A	Waldshut
geo	DE14	Tübingen
geo	DE141	Reutlingen
geo	DE142	Tübingen, Landkreis
geo	DE143	Zollernalbkreis
geo	DE144	Ulm, Stadtkreis
geo	DE145	Alb-Donau-Kreis
geo	DE146	Biberach
geo	DE147	Bodenseekreis
geo	DE148	Ravensburg
geo	DE149	Sigmaringen
geo	DE2	Bayern
geo	DE21	Oberbayern
geo	DE211	Ingolstadt, Kreisfreie Stadt
geo	DE212	München, Kreisfreie Stadt
geo	DE213	Rosenheim, Kreisfreie Stadt
geo	DE214	Altötting
geo	DE215	Berchtesgadener Land
geo	DE216	Bad Tölz-Wolfratshausen
geo	DE217	Dachau
geo	DE218	Ebersberg
geo	DE219	Eichstätt
geo	DE21A	Erding
geo	DE21B	Freising
geo	DE21C	Fürstenfeldbruck
geo	DE21D	Garmisch-Partenkirchen
geo	DE21E	Landsberg am Lech

concept	code	name
geo	DE21F	Miesbach
geo	DE21G	Mühldorf a. Inn
geo	DE21H	München, Landkreis
geo	DE21I	Neuburg-Schrobenhausen
geo	DE21J	Pfaffenhofen a. d. Ilm
geo	DE21K	Rosenheim, Landkreis
geo	DE21L	Starnberg
geo	DE21M	Traunstein
geo	DE21N	Weilheim-Schongau
geo	DE22	Niederbayern
geo	DE221	Landshut, Kreisfreie Stadt
geo	DE222	Passau, Kreisfreie Stadt
geo	DE223	Straubing, Kreisfreie Stadt
geo	DE224	Deggendorf
geo	DE225	Freyung-Grafenau
geo	DE226	Kelheim
geo	DE227	Landshut, Landkreis
geo	DE228	Passau, Landkreis
geo	DE229	Regen
geo	DE22A	Rottal-Inn
geo	DE22B	Straubing-Bogen
geo	DE22C	Dingolfing-Landau
geo	DE23	Oberpfalz
geo	DE231	Amberg, Kreisfreie Stadt
geo	DE232	Regensburg, Kreisfreie Stadt
geo	DE233	Weiden i. d. Opf, Kreisfreie Stadt
geo	DE234	Amberg-Sulzbach

concept	code	name
geo	DE235	Cham
geo	DE236	Neumarkt i. d. OPf.
geo	DE237	Neustadt a. d. Waldnaab
geo	DE238	Regensburg, Landkreis
geo	DE239	Schwandorf
geo	DE23A	Tirschenreuth
geo	DE24	Oberfranken
geo	DE241	Bamberg, Kreisfreie Stadt
geo	DE242	Bayreuth, Kreisfreie Stadt
geo	DE243	Coburg, Kreisfreie Stadt
geo	DE244	Hof, Kreisfreie Stadt
geo	DE245	Bamberg, Landkreis
geo	DE246	Bayreuth, Landkreis
geo	DE247	Coburg, Landkreis
geo	DE248	Forchheim
geo	DE249	Hof, Landkreis
geo	DE24A	Kronach
geo	DE24B	Kulmbach
geo	DE24C	Lichtenfels
geo	DE24D	Wunsiedel i. Fichtelgebirge
geo	DE25	Mittelfranken
geo	DE251	Ansbach, Kreisfreie Stadt
geo	DE252	Erlangen, Kreisfreie Stadt
geo	DE253	Fürth, Kreisfreie Stadt
geo	DE254	Nürnberg, Kreisfreie Stadt
geo	DE255	Schwabach, Kreisfreie Stadt
geo	DE256	Ansbach, Landkreis

concept	code	name
geo	DE257	Erlangen-Höchststadt
geo	DE258	Fürth, Landkreis
geo	DE259	Nürnberger Land
geo	DE25A	Neustadt a. d. Aisch-Bad Windsheim
geo	DE25B	Roth
geo	DE25C	Weißenburg-Gunzenhausen
geo	DE26	Unterfranken
geo	DE261	Aschaffenburg, Kreisfreie Stadt
geo	DE262	Schweinfurt, Kreisfreie Stadt
geo	DE263	Würzburg, Kreisfreie Stadt
geo	DE264	Aschaffenburg, Landkreis
geo	DE265	Bad Kissingen
geo	DE266	Rhön-Grabfeld
geo	DE267	Haßberge
geo	DE268	Kitzingen
geo	DE269	Miltenberg
geo	DE26A	Main-Spessart
geo	DE26B	Schweinfurt, Landkreis
geo	DE26C	Würzburg, Landkreis
geo	DE27	Schwaben
geo	DE271	Augsburg, Kreisfreie Stadt
geo	DE272	Kaufbeuren, Kreisfreie Stadt
geo	DE273	Kempten (Allgäu), Kreisfreie Stadt
geo	DE274	Memmingen, Kreisfreie Stadt
geo	DE275	Aichach-Friedberg

concept	code	name
geo	DE276	Augsburg, Landkreis
geo	DE277	Dillingen a.d. Donau
geo	DE278	Günzburg
geo	DE279	Neu-Ulm
geo	DE27A	Lindau (Bodensee)
geo	DE27B	Ostallgäu
geo	DE27C	Unterallgäu
geo	DE27D	Donau-Ries
geo	DE27E	Oberallgäu
geo	DE3	Berlin
geo	DE30	Berlin
geo	DE300	Berlin
geo	DE4	Brandenburg
geo	DE40	Brandenburg
geo	DE401	Brandenburg an der Havel, Kreisfreie Stadt
geo	DE402	Cottbus, Kreisfreie Stadt
geo	DE403	Frankfurt (Oder), Kreisfreie Stadt
geo	DE404	Potsdam, Kreisfreie Stadt
geo	DE405	Barnim
geo	DE406	Dahme-Spreewald
geo	DE407	Elbe-Elster
geo	DE408	Havelland
geo	DE409	Märkisch-Oderland
geo	DE40A	Oberhavel
geo	DE40B	Oberspreewald-Lausitz
geo	DE40C	Oder-Spree

concept	code	name
geo	DE40D	Ostprignitz-Ruppin
geo	DE40E	Potsdam-Mittelmark
geo	DE40F	Prignitz
geo	DE40G	Spree-Neiße
geo	DE40H	Teltow-Fläming
geo	DE40I	Uckermark
geo	DE5	Bremen
geo	DE50	Bremen
geo	DE501	Bremen, Kreisfreie Stadt
geo	DE502	Bremerhaven, Kreisfreie Stadt
geo	DE6	Hamburg
geo	DE60	Hamburg
geo	DE600	Hamburg
geo	DE7	Hessen
geo	DE71	Darmstadt
geo	DE711	Darmstadt, Kreisfreie Stadt
geo	DE712	Frankfurt am Main, Kreisfreie Stadt
geo	DE713	Offenbach am Main, Kreisfreie Stadt
geo	DE714	Wiesbaden, Kreisfreie Stadt
geo	DE715	Bergstraße
geo	DE716	Darmstadt-Dieburg
geo	DE717	Groß-Gerau
geo	DE718	Hochtaunuskreis
geo	DE719	Main-Kinzig-Kreis
geo	DE71A	Main-Taunus-Kreis

concept	code	name
geo	DE71B	Odenwaldkreis
geo	DE71C	Offenbach, Landkreis
geo	DE71D	Rheingau-Taunus-Kreis
geo	DE71E	Wetteraukreis
geo	DE72	Gießen
geo	DE721	Gießen, Landkreis
geo	DE722	Lahn-Dill-Kreis
geo	DE723	Limburg-Weilburg
geo	DE724	Marburg-Biedenkopf
geo	DE725	Vogelsbergkreis
geo	DE73	Kassel
geo	DE731	Kassel, Kreisfreie Stadt
geo	DE732	Fulda
geo	DE733	Hersfeld-Rotenburg
geo	DE734	Kassel, Landkreis
geo	DE735	Schwalm-Eder-Kreis
geo	DE736	Waldeck-Frankenberg
geo	DE737	Werra-Meißner-Kreis
geo	DE8	Mecklenburg-Vorpommern
geo	DE80	Mecklenburg-Vorpommern
geo	DE803	Rostock, Kreisfreie Stadt
geo	DE804	Schwerin, Kreisfreie Stadt
geo	DE80J	Mecklenburgische Seenplatte
geo	DE80K	Landkreis Rostock
geo	DE80L	Vorpommern-Rügen
geo	DE80M	Nordwestmecklenburg
geo	DE80N	Vorpommern-Greifswald

concept	code	name
geo	DE800	Ludwigslust-Parchim
geo	DE9	Niedersachsen
geo	DE91	Braunschweig
geo	DE911	Braunschweig, Kreisfreie Stadt
geo	DE912	Salzgitter, Kreisfreie Stadt
geo	DE913	Wolfsburg, Kreisfreie Stadt
geo	DE914	Gifhorn
geo	DE916	Goslar
geo	DE917	Helmstedt
geo	DE918	Northeim
geo	DE91A	Peine
geo	DE91B	Wolfenbüttel
geo	DE91C	Göttingen
geo	DE92	Hannover
geo	DE922	Diepholz
geo	DE923	Hameln-Pyrmont
geo	DE925	Hildesheim
geo	DE926	Holzminden
geo	DE927	Nienburg (Weser)
geo	DE928	Schaumburg
geo	DE929	Region Hannover
geo	DE93	Lüneburg
geo	DE931	Celle
geo	DE932	Cuxhaven
geo	DE933	Harburg
geo	DE934	Lüchow-Dannenberg
geo	DE935	Lüneburg, Landkreis



concept	code	name
geo	DE936	Osterholz
geo	DE937	Rotenburg (Wümme)
geo	DE938	Heidekreis
geo	DE939	Stade
geo	DE93A	Uelzen
geo	DE93B	Verden
geo	DE94	Weser-Ems
geo	DE941	Delmenhorst, Kreisfreie Stadt
geo	DE942	Emden, Kreisfreie Stadt
geo	DE943	Oldenburg (Oldenburg), Kreisfreie Stadt
geo	DE944	Osnabrück, Kreisfreie Stadt
geo	DE945	Wilhelmshaven, Kreisfreie Stadt
geo	DE946	Ammerland
geo	DE947	Aurich
geo	DE948	Cloppenburg
geo	DE949	Emsland
geo	DE94A	Friesland (DE)
geo	DE94B	Grafschaft Bentheim
geo	DE94C	Leer
geo	DE94D	Oldenburg, Landkreis
geo	DE94E	Osnabrück, Landkreis
geo	DE94F	Vechta
geo	DE94G	Wesermarsch
geo	DE94H	Wittmund
geo	DEA	Nordrhein-Westfalen
geo	DEA1	Düsseldorf

concept	code	name
geo	DEA11	Düsseldorf, Kreisfreie Stadt
geo	DEA12	Duisburg, Kreisfreie Stadt
geo	DEA13	Essen, Kreisfreie Stadt
geo	DEA14	Krefeld, Kreisfreie Stadt
geo	DEA15	Mönchengladbach, Kreisfreie Stadt
geo	DEA16	Mülheim an der Ruhr, Kreisfreie Stadt
geo	DEA17	Oberhausen, Kreisfreie Stadt
geo	DEA18	Remscheid, Kreisfreie Stadt
geo	DEA19	Solingen, Kreisfreie Stadt
geo	DEA1A	Wuppertal, Kreisfreie Stadt
geo	DEA1B	Kleve
geo	DEA1C	Mettmann
geo	DEA1D	Rhein-Kreis Neuss
geo	DEA1E	Viersen
geo	DEA1F	Wesel
geo	DEA2	Köln
geo	DEA22	Bonn, Kreisfreie Stadt
geo	DEA23	Köln, Kreisfreie Stadt
geo	DEA24	Leverkusen, Kreisfreie Stadt
geo	DEA26	Düren
geo	DEA27	Rhein-Erft-Kreis
geo	DEA28	Euskirchen
geo	DEA29	Heinsberg
geo	DEA2A	Oberbergischer Kreis
geo	DEA2B	Rheinisch-Bergischer Kreis
geo	DEA2C	Rhein-Sieg-Kreis

concept	code	name
geo	DEA2D	Städteregion Aachen
geo	DEA3	Münster
geo	DEA31	Bottrop, Kreisfreie Stadt
geo	DEA32	Gelsenkirchen, Kreisfreie Stadt
geo	DEA33	Münster, Kreisfreie Stadt
geo	DEA34	Borken
geo	DEA35	Coesfeld
geo	DEA36	Recklinghausen
geo	DEA37	Steinfurt
geo	DEA38	Warendorf
geo	DEA4	Detmold
geo	DEA41	Bielefeld, Kreisfreie Stadt
geo	DEA42	Gütersloh
geo	DEA43	Herford
geo	DEA44	Höxter
geo	DEA45	Lippe
geo	DEA46	Minden-Lübbecke
geo	DEA47	Paderborn
geo	DEA5	Arnsberg
geo	DEA51	Bochum, Kreisfreie Stadt
geo	DEA52	Dortmund, Kreisfreie Stadt
geo	DEA53	Hagen, Kreisfreie Stadt
geo	DEA54	Hamm, Kreisfreie Stadt
geo	DEA55	Herne, Kreisfreie Stadt
geo	DEA56	Ennepe-Ruhr-Kreis
geo	DEA57	Hochsauerlandkreis
geo	DEA58	Märkischer Kreis

concept	code	name
geo	DEA59	Olpe
geo	DEA5A	Siegen-Wittgenstein
geo	DEA5B	Soest
geo	DEA5C	Unna
geo	DEB	Rheinland-Pfalz
geo	DEB1	Koblenz
geo	DEB11	Koblenz, Kreisfreie Stadt
geo	DEB12	Ahrweiler
geo	DEB13	Altenkirchen (Westerwald)
geo	DEB14	Bad Kreuznach
geo	DEB15	Birkenfeld
geo	DEB17	Mayen-Koblenz
geo	DEB18	Neuwied
geo	DEB1A	Rhein-Lahn-Kreis
geo	DEB1B	Westerwaldkreis
geo	DEB1C	Cochem-Zell
geo	DEB1D	Rhein-Hunsrück-Kreis
geo	DEB2	Trier
geo	DEB21	Trier, Kreisfreie Stadt
geo	DEB22	Bernkastel-Wittlich
geo	DEB23	Eifelkreis Bitburg-Prüm
geo	DEB24	Vulkaneifel
geo	DEB25	Trier-Saarburg
geo	DEB3	Rheinhessen-Pfalz
geo	DEB31	Frankenthal (Pfalz), Kreisfreie Stadt
geo	DEB32	Kaiserslautern, Kreisfreie Stadt

concept	code	name
geo	DEB33	Landau in der Pfalz, Kreisfreie Stadt
geo	DEB34	Ludwigshafen am Rhein, Kreisfreie Stadt
geo	DEB35	Mainz, Kreisfreie Stadt
geo	DEB36	Neustadt an der Weinstraße, Kreisfreie Stadt
geo	DEB37	Pirmasens, Kreisfreie Stadt
geo	DEB38	Speyer, Kreisfreie Stadt
geo	DEB39	Worms, Kreisfreie Stadt
geo	DEB3A	Zweibrücken, Kreisfreie Stadt
geo	DEB3B	Alzey-Worms
geo	DEB3C	Bad Dürkheim
geo	DEB3D	Donnersbergkreis
geo	DEB3E	Germersheim
geo	DEB3F	Kaiserslautern, Landkreis
geo	DEB3G	Kusel
geo	DEB3H	Südliche Weinstraße
geo	DEB3I	Rhein-Pfalz-Kreis
geo	DEB3J	Mainz-Bingen
geo	DEB3K	Südwestpfalz
geo	DEC	Saarland
geo	DEC0	Saarland
geo	DEC01	Regionalverband Saarbrücken
geo	DEC02	Merzig-Wadern
geo	DEC03	Neunkirchen
geo	DEC04	Saarlouis
geo	DEC05	Saarpfalz-Kreis

concept	code	name
geo	DEC06	St. Wendel
geo	DED	Sachsen
geo	DED2	Dresden
geo	DED21	Dresden, Kreisfreie Stadt
geo	DED2C	Bautzen
geo	DED2D	Görlitz
geo	DED2E	Meißen
geo	DED2F	Sächsische Schweiz-Osterzgebirge
geo	DED4	Chemnitz
geo	DED41	Chemnitz, Kreisfreie Stadt
geo	DED42	Erzgebirgskreis
geo	DED43	Mittelsachsen
geo	DED44	Vogtlandkreis
geo	DED45	Zwickau
geo	DED5	Leipzig
geo	DED51	Leipzig, Kreisfreie Stadt
geo	DED52	Leipzig
geo	DED53	Nordsachsen
geo	DEE	Sachsen-Anhalt
geo	DEE0	Sachsen-Anhalt
geo	DEE01	Dessau-Roßlau, Kreisfreie Stadt
geo	DEE02	Halle (Saale), Kreisfreie Stadt
geo	DEE03	Magdeburg, Kreisfreie Stadt
geo	DEE04	Altmarkkreis Salzwedel
geo	DEE05	Anhalt-Bitterfeld
geo	DEE06	Jerichower Land

concept	code	name
geo	DEE07	Börde
geo	DEE08	Burgenlandkreis
geo	DEE09	Harz
geo	DEE0A	Mansfeld-Südharz
geo	DEE0B	Saalekreis
geo	DEE0C	Salzlandkreis
geo	DEE0D	Stendal
geo	DEE0E	Wittenberg
geo	DEF	Schleswig-Holstein
geo	DEF0	Schleswig-Holstein
geo	DEF01	Flensburg, Kreisfreie Stadt
geo	DEF02	Kiel, Kreisfreie Stadt
geo	DEF03	Lübeck, Kreisfreie Stadt
geo	DEF04	Neumünster, Kreisfreie Stadt
geo	DEF05	Dithmarschen
geo	DEF06	Herzogtum Lauenburg
geo	DEF07	Nordfriesland
geo	DEF08	Ostholstein
geo	DEF09	Pinneberg
geo	DEF0A	Plön
geo	DEF0B	Rendsburg-Eckernförde
geo	DEF0C	Schleswig-Flensburg
geo	DEF0D	Segeberg
geo	DEF0E	Steinburg
geo	DEF0F	Stormarn
geo	DEG	Thüringen
geo	DEG0	Thüringen

concept	code	name
geo	DEG01	Erfurt, Kreisfreie Stadt
geo	DEG02	Gera, Kreisfreie Stadt
geo	DEG03	Jena, Kreisfreie Stadt
geo	DEG05	Weimar, Kreisfreie Stadt
geo	DEG06	Eichsfeld
geo	DEG07	Nordhausen
geo	DEG09	Unstrut-Hainich-Kreis
geo	DEG0A	Kyffhäuserkreis
geo	DEG0C	Gotha
geo	DEG0D	Sömmerda
geo	DEG0E	Hildburghausen
geo	DEG0G	Weimarer Land
geo	DEG0J	Saale-Holzland-Kreis
geo	DEG0K	Saale-Orla-Kreis
geo	DEG0L	Greiz
geo	DEG0M	Altenburger Land
geo	DEG0Q	Schmalkalden-Meiningen
geo	DEG0R	Wartburgkreis
geo	DEG0S	Suhl, Kreisfreie Stadt
geo	DEG0T	Ilm-Kreis
geo	DEG0U	Saalfeld-Rudolstadt
geo	DEG0V	Sonneberg
geo	EE	Estonia
geo	EE0	Eesti
geo	EE00	Eesti
geo	EE001	Põhja-Eesti
geo	EE004	Lääne-Eesti



concept	code	name
geo	EE008	Lõuna-Eesti
geo	EE009	Kesk-Eesti
geo	EE00A	Kirde-Eesti
geo	IE	Ireland
geo	IE0	Ireland
geo	IE04	Northern and Western
geo	IE041	Border
geo	IE042	West
geo	IE05	Southern
geo	IE051	Mid-West
geo	IE052	South-East
geo	IE053	South-West
geo	IE06	Eastern and Midland
geo	IE061	Dublin
geo	IE062	Mid-East
geo	IE063	Midland
geo	EL	Greece
geo	EL3	Attiki
geo	EL30	Attiki
geo	EL301	Voreios Tomeas Athinon
geo	EL302	Dytikos Tomeas Athinon
geo	EL303	Kentrikos Tomeas Athinon
geo	EL304	Notios Tomeas Athinon
geo	EL305	Anatoliki Attiki
geo	EL306	Dytiki Attiki
geo	EL307	Peiraias, Nisoi
geo	EL4	Nisia Aigaiou, Kriti

concept	code	name
geo	EL41	Voreio Aigaio
geo	EL411	Lesvos, Limnos
geo	EL412	Ikaria, Samos
geo	EL413	Chios
geo	EL42	Notio Aigaio
geo	EL421	Kalymnos, Karpathos – Iroiki Nisos Kasos, Kos, Rodos
geo	EL422	Andros, Thira, Kea, Milos, Mykonos, Naxos, Paros, Syros, Tinos
geo	EL43	Kriti
geo	EL431	Irakleio
geo	EL432	Lasithi
geo	EL433	Rethymni
geo	EL434	Chania
geo	EL5	Voreia Elláda
geo	EL51	Anatoliki Makedonia, Thraki
geo	EL511	Evros
geo	EL512	Xanthi
geo	EL513	Rodopi
geo	EL514	Drama
geo	EL515	Thasos, Kavala
geo	EL52	Kentriki Makedonia
geo	EL521	Imathia
geo	EL522	Thessaloniki
geo	EL523	Kilkis
geo	EL524	Pella
geo	EL525	Pieria

concept	code	name
geo	EL526	Serres
geo	EL527	Chalkidiki
geo	EL53	Dytiki Makedonia
geo	EL531	Grevena, Kozani
geo	EL532	Kastoria
geo	EL533	Florina
geo	EL54	Ipeiros
geo	EL541	Arta, Preveza
geo	EL542	Thesprotia
geo	EL543	Ioannina
geo	EL6	Kentriki Elláda
geo	EL61	Thessalia
geo	EL611	Karditsa, Trikala
geo	EL612	Larisa
geo	EL613	Magnisia, Sporades
geo	EL62	Ionia Nisia
geo	EL621	Zakynthos
geo	EL622	Kerkyra
geo	EL623	Ithaki, Kefallinia
geo	EL624	Lefkada
geo	EL63	Dytiki Elláda
geo	EL631	Aitoloakarnania
geo	EL632	Achaia
geo	EL633	Ileia
geo	EL64	Stereia Elláda
geo	EL641	Voiotia
geo	EL642	Evvoia

concept	code	name
geo	EL643	Evrytania
geo	EL644	Fthiotida
geo	EL645	Fokida
geo	EL65	Peloponnisos
geo	EL651	Argolida, Arkadia
geo	EL652	Korinthia
geo	EL653	Lakonia, Messinia
geo	ES	Spain
geo	ES1	Noroeste
geo	ES11	Galicia
geo	ES111	A Coruña
geo	ES112	Lugo
geo	ES113	Ourense
geo	ES114	Pontevedra
geo	ES12	Principado de Asturias
geo	ES120	Asturias
geo	ES13	Cantabria
geo	ES130	Cantabria
geo	ES2	Noreste
geo	ES21	País Vasco
geo	ES211	Araba/Álava
geo	ES212	Gipuzkoa
geo	ES213	Bizkaia
geo	ES22	Comunidad Foral de Navarra
geo	ES220	Navarra
geo	ES23	La Rioja
geo	ES230	La Rioja

concept	code	name
geo	ES24	Aragón
geo	ES241	Huesca
geo	ES242	Teruel
geo	ES243	Zaragoza
geo	ES3	Comunidad de Madrid
geo	ES30	Comunidad de Madrid
geo	ES300	Madrid
geo	ES4	Centro (ES)
geo	ES41	Castilla y León
geo	ES411	Ávila
geo	ES412	Burgos
geo	ES413	León
geo	ES414	Palencia
geo	ES415	Salamanca
geo	ES416	Segovia
geo	ES417	Soria
geo	ES418	Valladolid
geo	ES419	Zamora
geo	ES42	Castilla-La Mancha
geo	ES421	Albacete
geo	ES422	Ciudad Real
geo	ES423	Cuenca
geo	ES424	Guadalajara
geo	ES425	Toledo
geo	ES43	Extremadura
geo	ES431	Badajoz
geo	ES432	Cáceres

concept	code	name
geo	ES5	Este
geo	ES51	Cataluña
geo	ES511	Barcelona
geo	ES512	Girona
geo	ES513	Lleida
geo	ES514	Tarragona
geo	ES52	Comunitat Valenciana
geo	ES521	Alicante/Alacant
geo	ES522	Castellón/Castelló
geo	ES523	Valencia/València
geo	ES53	Illes Balears
geo	ES531	Eivissa y Formentera
geo	ES532	Mallorca
geo	ES533	Menorca
geo	ES6	Sur
geo	ES61	Andalucía
geo	ES611	Almería
geo	ES612	Cádiz
geo	ES613	Córdoba
geo	ES614	Granada
geo	ES615	Huelva
geo	ES616	Jaén
geo	ES617	Málaga
geo	ES618	Sevilla
geo	ES62	Región de Murcia
geo	ES620	Murcia
geo	ES63	Ciudad de Ceuta

concept	code	name
geo	ES630	Ceuta
geo	ES64	Ciudad de Melilla
geo	ES640	Melilla
geo	ES7	Canarias
geo	ES70	Canarias
geo	ES703	El Hierro
geo	ES704	Fuerteventura
geo	ES705	Gran Canaria
geo	ES706	La Gomera
geo	ES707	La Palma
geo	ES708	Lanzarote
geo	ES709	Tenerife
geo	ESZ	Extra-Regio NUTS 1
geo	ESZZ	Extra-Regio NUTS 2
geo	ESZZZ	Extra-Regio NUTS 3
geo	FR	France
geo	FR1	Ile de France
geo	FR10	Ile de France
geo	FR101	Paris
geo	FR102	Seine-et-Marne
geo	FR103	Yvelines
geo	FR104	Essonne
geo	FR105	Hauts-de-Seine
geo	FR106	Seine-Saint-Denis
geo	FR107	Val-de-Marne
geo	FR108	Val-d'Oise
geo	FRB	Centre — Val de Loire

concept	code	name
geo	FRB0	Centre — Val de Loire
geo	FRB01	Cher
geo	FRB02	Eure-et-Loir
geo	FRB03	Indre
geo	FRB04	Indre-et-Loire
geo	FRB05	Loir-et-Cher
geo	FRB06	Loiret
geo	FRC	Bourgogne-Franche-Comté
geo	FRC1	Bourgogne
geo	FRC11	Côte-d'Or
geo	FRC12	Nièvre
geo	FRC13	Saône-et-Loire
geo	FRC14	Yonne
geo	FRC2	Franche-Comté
geo	FRC21	Doubs
geo	FRC22	Jura
geo	FRC23	Haute-Saône
geo	FRC24	Territoire de Belfort
geo	FRD	Normandie
geo	FRD1	Basse-Normandie
geo	FRD11	Calvados
geo	FRD12	Manche
geo	FRD13	Orne
geo	FRD2	Haute-Normandie
geo	FRD21	Eure
geo	FRD22	Seine-Maritime
geo	FRE	Hauts-de-France



concept	code	name
geo	FRE1	Nord-Pas de Calais
geo	FRE11	Nord
geo	FRE12	Pas-de-Calais
geo	FRE2	Picardie
geo	FRE21	Aisne
geo	FRE22	Oise
geo	FRE23	Somme
geo	FRF	Grand Est
geo	FRF1	Alsace
geo	FRF11	Bas-Rhin
geo	FRF12	Haut-Rhin
geo	FRF2	Champagne-Ardenne
geo	FRF21	Ardennes
geo	FRF22	Aube
geo	FRF23	Marne
geo	FRF24	Haute-Marne
geo	FRF3	Lorraine
geo	FRF31	Meurthe-et-Moselle
geo	FRF32	Meuse
geo	FRF33	Moselle
geo	FRF34	Vosges
geo	FRG	Pays de la Loire
geo	FRG0	Pays de la Loire
geo	FRG01	Loire-Atlantique
geo	FRG02	Maine-et-Loire
geo	FRG03	Mayenne
geo	FRG04	Sarthe

concept	code	name
geo	FRG05	Vendée
geo	FRH	Bretagne
geo	FRH0	Bretagne
geo	FRH01	Côtes-d'Armor
geo	FRH02	Finistère
geo	FRH03	Ille-et-Vilaine
geo	FRH04	Morbihan
geo	FRI	Nouvelle-Aquitaine
geo	FRI1	Aquitaine
geo	FRI11	Dordogne
geo	FRI12	Gironde
geo	FRI13	Landes
geo	FRI14	Lot-et-Garonne
geo	FRI15	Pyrénées-Atlantiques
geo	FRI2	Limousin
geo	FRI21	Corrèze
geo	FRI22	Creuse
geo	FRI23	Haute-Vienne
geo	FRI3	Poitou-Charentes
geo	FRI31	Charente
geo	FRI32	Charente-Maritime
geo	FRI33	Deux-Sèvres
geo	FRI34	Vienne
geo	FRJ	Occitanie
geo	FRJ1	Languedoc-Roussillon
geo	FRJ11	Aude
geo	FRJ12	Gard

concept	code	name
geo	FRJ13	Hérault
geo	FRJ14	Lozère
geo	FRJ15	Pyrénées-Orientales
geo	FRJ2	Midi-Pyrénées
geo	FRJ21	Ariège
geo	FRJ22	Aveyron
geo	FRJ23	Haute-Garonne
geo	FRJ24	Gers
geo	FRJ25	Lot
geo	FRJ26	Hautes-Pyrénées
geo	FRJ27	Tarn
geo	FRJ28	Tarn-et-Garonne
geo	FRK	Auvergne-Rhône-Alpes
geo	FRK1	Auvergne
geo	FRK11	Allier
geo	FRK12	Cantal
geo	FRK13	Haute-Loire
geo	FRK14	Puy-de-Dôme
geo	FRK2	Rhône-Alpes
geo	FRK21	Ain
geo	FRK22	Ardèche
geo	FRK23	Drôme
geo	FRK24	Isère
geo	FRK25	Loire
geo	FRK26	Rhône
geo	FRK27	Savoie
geo	FRK28	Haute-Savoie

concept	code	name
geo	FRL	Provence-Alpes-Côte d’Azur
geo	FRL0	Provence-Alpes-Côte d’Azur
geo	FRL01	Alpes-de-Haute-Provence
geo	FRL02	Hautes-Alpes
geo	FRL03	Alpes-Maritimes
geo	FRL04	Bouches-du-Rhône
geo	FRL05	Var
geo	FRL06	Vaucluse
geo	FRM	Corse
geo	FRM0	Corse
geo	FRM01	Corse-du-Sud
geo	FRM02	Haute-Corse
geo	FRY	RUP FR — Régions Ultrapériphériques Françaises
geo	FRY1	Guadeloupe
geo	FRY10	Guadeloupe
geo	FRY2	Martinique
geo	FRY20	Martinique
geo	FRY3	Guyane
geo	FRY30	Guyane
geo	FRY4	La Réunion
geo	FRY40	La Réunion
geo	FRY5	Mayotte
geo	FRY50	Mayotte
geo	HR	Croatia
geo	HR0	Hrvatska
geo	HR02	Panonska Hrvatska

concept	code	name
geo	HR021	Bjelovarsko-bilogorska županija
geo	HR022	Virovitičko-podravska županija
geo	HR023	Požeško-slavonska županija
geo	HR024	Brodsko-posavska županija
geo	HR025	Osječko-baranjska županija
geo	HR026	Vukovarsko-srijemska županija
geo	HR027	Karlovačka županija
geo	HR028	Sisačko-moslavačka županija
geo	HR03	Jadranska Hrvatska
geo	HR031	Primorsko-goranska županija
geo	HR032	Ličko-senjska županija
geo	HR033	Zadarska županija
geo	HR034	Šibensko-kninska županija
geo	HR035	Splitsko-dalmatinska županija
geo	HR036	Istarska županija
geo	HR037	Dubrovačko-neretvanska županija
geo	HR05	Grad Zagreb
geo	HR050	Grad Zagreb
geo	HR06	Sjeverna Hrvatska
geo	HR061	Međimurska županija
geo	HR062	Varaždinska županija
geo	HR063	Koprivničko-križevačka županija
geo	HR064	Krapinsko-zagorska županija

concept	code	name
geo	HR065	Zagrebačka županija
geo	IT	Italy
geo	ITC	Nord-Ovest
geo	ITC1	Piemonte
geo	ITC11	Torino
geo	ITC12	Vercelli
geo	ITC13	Biella
geo	ITC14	Verbano-Cusio-Ossola
geo	ITC15	Novara
geo	ITC16	Cuneo
geo	ITC17	Asti
geo	ITC18	Alessandria
geo	ITC2	Valle d'Aosta/Vallée d'Aoste
geo	ITC20	Valle d'Aosta/Vallée d'Aoste
geo	ITC3	Liguria
geo	ITC31	Imperia
geo	ITC32	Savona
geo	ITC33	Genova
geo	ITC34	La Spezia
geo	ITC4	Lombardia
geo	ITC41	Varese
geo	ITC42	Como
geo	ITC43	Lecco
geo	ITC44	Sondrio
geo	ITC46	Bergamo
geo	ITC47	Brescia
geo	ITC48	Pavia

concept	code	name
geo	ITC49	Lodi
geo	ITC4A	Cremona
geo	ITC4B	Mantova
geo	ITC4C	Milano
geo	ITC4D	Monza e della Brianza
geo	ITF	Sud
geo	ITF1	Abruzzo
geo	ITF11	L'Aquila
geo	ITF12	Teramo
geo	ITF13	Pescara
geo	ITF14	Chieti
geo	ITF2	Molise
geo	ITF21	Isernia
geo	ITF22	Campobasso
geo	ITF3	Campania
geo	ITF31	Caserta
geo	ITF32	Benevento
geo	ITF33	Napoli
geo	ITF34	Avellino
geo	ITF35	Salerno
geo	ITF4	Puglia
geo	ITF43	Taranto
geo	ITF44	Brindisi
geo	ITF45	Lecce
geo	ITF46	Foggia
geo	ITF47	Bari
geo	ITF48	Barletta-Andria-Trani

concept	code	name
geo	ITF5	Basilicata
geo	ITF51	Potenza
geo	ITF52	Matera
geo	ITF6	Calabria
geo	ITF61	Cosenza
geo	ITF62	Crotone
geo	ITF63	Catanzaro
geo	ITF64	Vibo Valentia
geo	ITF65	Reggio Calabria
geo	ITG	Isole
geo	ITG1	Sicilia
geo	ITG11	Trapani
geo	ITG12	Palermo
geo	ITG13	Messina
geo	ITG14	Agrigento
geo	ITG15	Caltanissetta
geo	ITG16	Enna
geo	ITG17	Catania
geo	ITG18	Ragusa
geo	ITG19	Siracusa
geo	ITG2	Sardegna
geo	ITG2D	Sassari
geo	ITG2E	Nuoro
geo	ITG2F	Cagliari
geo	ITG2G	Oristano
geo	ITG2H	Sud Sardegna
geo	ITH	Nord-Est



concept	code	name
geo	ITH1	Provincia Autonoma di Bolzano/Bozen
geo	ITH10	Bolzano-Bozen
geo	ITH2	Provincia Autonoma di Trento
geo	ITH20	Trento
geo	ITH3	Veneto
geo	ITH31	Verona
geo	ITH32	Vicenza
geo	ITH33	Belluno
geo	ITH34	Treviso
geo	ITH35	Venezia
geo	ITH36	Padova
geo	ITH37	Rovigo
geo	ITH4	Friuli-Venezia Giulia
geo	ITH41	Pordenone
geo	ITH42	Udine
geo	ITH43	Gorizia
geo	ITH44	Trieste
geo	ITH5	Emilia-Romagna
geo	ITH51	Piacenza
geo	ITH52	Parma
geo	ITH53	Reggio nell'Emilia
geo	ITH54	Modena
geo	ITH55	Bologna
geo	ITH56	Ferrara
geo	ITH57	Ravenna
geo	ITH58	Forlì-Cesena
geo	ITH59	Rimini

concept	code	name
geo	ITI	Centro (IT)
geo	ITI1	Toscana
geo	ITI11	Massa-Carrara
geo	ITI12	Lucca
geo	ITI13	Pistoia
geo	ITI14	Firenze
geo	ITI15	Prato
geo	ITI16	Livorno
geo	ITI17	Pisa
geo	ITI18	Arezzo
geo	ITI19	Siena
geo	ITI1A	Grosseto
geo	ITI2	Umbria
geo	ITI21	Perugia
geo	ITI22	Terni
geo	ITI3	Marche
geo	ITI31	Pesaro e Urbino
geo	ITI32	Ancona
geo	ITI33	Macerata
geo	ITI34	Ascoli Piceno
geo	ITI35	Fermo
geo	ITI4	Lazio
geo	ITI41	Viterbo
geo	ITI42	Rieti
geo	ITI43	Roma
geo	ITI44	Latina
geo	ITI45	Frosinone

concept	code	name
geo	ITZ	Extra-Regio NUTS 1
geo	ITZZ	Extra-Regio NUTS 2
geo	ITZZZ	Extra-Regio NUTS 3
geo	CY	Cyprus
geo	CY0	Kýpros
geo	CY00	Kýpros
geo	CY000	Kýpros
geo	LV	Latvia
geo	LV0	Latvija
geo	LV00	Latvija
geo	LV005	Latgale
geo	LV009	Zemgale
geo	LV00A	Rīga
geo	LV00B	Kurzeme
geo	LV00C	Vidzeme
geo	LT	Lithuania
geo	LT0	Lietuva
geo	LT01	Sostinės regionas
geo	LT011	Vilniaus apskritis
geo	LT02	Vidurio ir vakarų Lietuvos regionas
geo	LT021	Alytaus apskritis
geo	LT022	Kauno apskritis
geo	LT023	Klaipėdos apskritis
geo	LT024	Marijampolės apskritis
geo	LT025	Panevėžio apskritis
geo	LT026	Šiaulių apskritis
geo	LT027	Tauragės apskritis

concept	code	name
geo	LT028	Telšiai apskritis
geo	LT029	Utenos apskritis
geo	LU	Luxembourg
geo	LU0	Luxembourg
geo	LU00	Luxembourg
geo	LU000	Luxembourg
geo	HU	Hungary
geo	HU1	Közép-Magyarország
geo	HU11	Budapest
geo	HU110	Budapest
geo	HU12	Pest
geo	HU120	Pest
geo	HU2	Dunántúl
geo	HU21	Közép-Dunántúl
geo	HU211	Fejér
geo	HU212	Komárom-Esztergom
geo	HU213	Veszprém
geo	HU22	Nyugat-Dunántúl
geo	HU221	Győr-Moson-Sopron
geo	HU222	Vas
geo	HU223	Zala
geo	HU23	Dél-Dunántúl
geo	HU231	Baranya
geo	HU232	Somogy
geo	HU233	Tolna
geo	HU3	Alföld és Észak
geo	HU31	Észak-Magyarország

concept	code	name
geo	HU311	Borsod-Abaúj-Zemplén
geo	HU312	Heves
geo	HU313	Nógrád
geo	HU32	Észak-Alföld
geo	HU321	Hajdú-Bihar
geo	HU322	Jász-Nagykun-Szolnok
geo	HU323	Szabolcs-Szatmár-Bereg
geo	HU33	Dél-Alföld
geo	HU331	Bács-Kiskun
geo	HU332	Békés
geo	HU333	Csongrád-Csanád
geo	HUZ	Extra-Regio NUTS 1
geo	HUZZ	Extra-Regio NUTS 2
geo	HUZZZ	Extra-Regio NUTS 3
geo	MT	Malta
geo	MT0	Malta
geo	MT00	Malta
geo	MT001	Malta
geo	MT002	Gozo and Comino/Għawdex u Kemmuna
geo	MTZ	Extra-Regio NUTS 1
geo	MTZZ	Extra-Regio NUTS 2
geo	MTZZZ	Extra-Regio NUTS 3
geo	NL	Netherlands
geo	NL1	Noord-Nederland
geo	NL11	Groningen
geo	NL112	Delfzijl en omgeving
geo	NL114	Oost-Groningen

concept	code	name
geo	NL115	Overig Groningen
geo	NL12	Friesland (NL)
geo	NL126	Zuidoost-Friesland
geo	NL127	Noord-Friesland
geo	NL128	Zuidwest-Friesland
geo	NL13	Drenthe
geo	NL131	Noord-Drenthe
geo	NL132	Zuidoost-Drenthe
geo	NL133	Zuidwest-Drenthe
geo	NL2	Oost-Nederland
geo	NL21	Overijssel
geo	NL211	Noord-Overijssel
geo	NL212	Zuidwest-Overijssel
geo	NL213	Twente
geo	NL22	Gelderland
geo	NL221	Veluwe
geo	NL224	Zuidwest-Gelderland
geo	NL225	Achterhoek
geo	NL226	Arnhem/Nijmegen
geo	NL23	Flevoland
geo	NL230	Flevoland
geo	NL3	West-Nederland
geo	NL32	Noord-Holland
geo	NL321	Kop van Noord-Holland
geo	NL323	IJmond
geo	NL325	Zaanstreek
geo	NL327	Het Gooi en Vechtstreek

concept	code	name
geo	NL328	Alkmaar en omgeving
geo	NL32A	Agglomeratie Haarlem
geo	NL32B	Groot-Amsterdam
geo	NL34	Zeeland
geo	NL341	Zeeuwsch-Vlaanderen
geo	NL342	Overig Zeeland
geo	NL35	Utrecht
geo	NL350	Utrecht
geo	NL36	Zuid-Holland
geo	NL361	Agglomeratie 's-Gravenhage
geo	NL362	Delft en Westland
geo	NL363	Agglomeratie Leiden en Bollenstreek
geo	NL364	Zuidoost-Zuid-Holland
geo	NL365	Oost-Zuid-Holland
geo	NL366	Groot-Rijnmond
geo	NL4	Zuid-Nederland
geo	NL41	Noord-Brabant
geo	NL411	West-Noord-Brabant
geo	NL414	Zuidoost-Noord-Brabant
geo	NL415	Midden-Noord-Brabant
geo	NL416	Noordoost-Noord-Brabant
geo	NL42	Limburg (NL)
geo	NL421	Noord-Limburg
geo	NL422	Midden-Limburg
geo	NL423	Zuid-Limburg
geo	NLZ	Extra-Regio NUTS 1
geo	NLZZ	Extra-Regio NUTS 2

concept	code	name
geo	NLZZZ	Extra-Regio NUTS 3
geo	AT	Austria
geo	AT1	Ostösterreich
geo	AT11	Burgenland
geo	AT111	Mittelburgenland
geo	AT112	Nordburgenland
geo	AT113	Südburgenland
geo	AT12	Niederösterreich
geo	AT121	Mostviertel-Eisenwurzen
geo	AT122	Niederösterreich-Süd
geo	AT123	Sankt Pölten
geo	AT124	Waldviertel
geo	AT125	Weinviertel
geo	AT126	Wiener Umland/Nordteil
geo	AT127	Wiener Umland/Südteil
geo	AT13	Wien
geo	AT130	Wien
geo	AT2	Südösterreich
geo	AT21	Kärnten
geo	AT211	Klagenfurt-Villach
geo	AT212	Oberkärnten
geo	AT213	Unterkärnten
geo	AT22	Steiermark
geo	AT221	Graz
geo	AT222	Liezen
geo	AT223	Östliche Obersteiermark
geo	AT224	Oststeiermark



concept	code	name
geo	AT225	West- und Südsteiermark
geo	AT226	Westliche Obersteiermark
geo	AT3	Westösterreich
geo	AT31	Oberösterreich
geo	AT311	Innviertel
geo	AT312	Linz-Wels
geo	AT313	Mühlviertel
geo	AT314	Steyr-Kirchdorf
geo	AT315	Traunviertel
geo	AT32	Salzburg
geo	AT321	Lungau
geo	AT322	Pinzgau-Pongau
geo	AT323	Salzburg und Umgebung
geo	AT33	Tirol
geo	AT331	Außerfern
geo	AT332	Innsbruck
geo	AT333	Osttirol
geo	AT334	Tiroler Oberland
geo	AT335	Tiroler Unterland
geo	AT34	Vorarlberg
geo	AT341	Bludenz-Bregenzer Wald
geo	AT342	Rheintal-Bodenseegebiet
geo	ATZ	Extra-Regio NUTS 1
geo	ATZZ	Extra-Regio NUTS 2
geo	ATZZZ	Extra-Regio NUTS 3
geo	PL	Poland
geo	PL2	Makroregion południowy

concept	code	name
geo	PL21	Małopolskie
geo	PL213	Miasto Kraków
geo	PL214	Krakowski
geo	PL217	Tarnowski
geo	PL218	Nowosądecki
geo	PL219	Nowotarski
geo	PL21A	Oświęcimski
geo	PL22	Śląskie
geo	PL224	Częstochowski
geo	PL225	Bielski
geo	PL227	Rybnicki
geo	PL228	Bytomski
geo	PL229	Gliwicki
geo	PL22A	Katowicki
geo	PL22B	Sosnowiecki
geo	PL22C	Tyski
geo	PL4	Makroregion północno-zachodni
geo	PL41	Wielkopolskie
geo	PL411	Pilski
geo	PL414	Koniński
geo	PL415	Miasto Poznań
geo	PL416	Kaliski
geo	PL417	Leszczyński
geo	PL418	Poznański
geo	PL42	Zachodniopomorskie
geo	PL424	Miasto Szczecin
geo	PL426	Koszaliński

concept	code	name
geo	PL427	Szczecinecko-pyrzycki
geo	PL428	Szczeciński
geo	PL43	Lubuskie
geo	PL431	Gorzowski
geo	PL432	Zielonogórski
geo	PL5	Makroregion południowo-zachodni
geo	PL51	Dolnośląskie
geo	PL514	Miasto Wrocław
geo	PL515	Jeleniogórski
geo	PL516	Legnicko-głogowski
geo	PL517	Wałbrzyski
geo	PL518	Wrocławski
geo	PL52	Opolskie
geo	PL523	Nyski
geo	PL524	Opolski
geo	PL6	Makroregion północny
geo	PL61	Kujawsko-pomorskie
geo	PL613	Bydgosko-toruński
geo	PL616	Grudziądzki
geo	PL617	Inowrocławski
geo	PL618	Świecki
geo	PL619	Włocławski
geo	PL62	Warmińsko-mazurskie
geo	PL621	Elbląski
geo	PL622	Olsztyński
geo	PL623	Etcki
geo	PL63	Pomorskie

concept	code	name
geo	PL633	Trójmiejski
geo	PL634	Gdański
geo	PL636	Słupski
geo	PL637	Chojnicki
geo	PL638	Starogardzki
geo	PL7	Makroregion centralny
geo	PL71	Łódzkie
geo	PL711	Miasto Łódź
geo	PL712	Łódzki
geo	PL713	Piotrkowski
geo	PL714	Sieradzki
geo	PL715	Skierniewicki
geo	PL72	Świętokrzyskie
geo	PL721	Kielecki
geo	PL722	Sandomiersko-jędrzejowski
geo	PL8	Makroregion wschodni
geo	PL81	Lubelskie
geo	PL811	Bialski
geo	PL812	Chełmsko-zamojski
geo	PL814	Lubelski
geo	PL815	Puławski
geo	PL82	Podkarpackie
geo	PL821	Krośnieński
geo	PL822	Przemyski
geo	PL823	Rzeszowski
geo	PL824	Tarnobrzeski
geo	PL84	Podlaskie

concept	code	name
geo	PL841	Białostocki
geo	PL842	Łomżyński
geo	PL843	Suwalski
geo	PL9	Makroregion województwo mazowieckie
geo	PL91	Warszawski stołeczny
geo	PL911	Miasto Warszawa
geo	PL912	Warszawski wschodni
geo	PL913	Warszawski zachodni
geo	PL92	Mazowiecki regionalny
geo	PL921	Radomski
geo	PL922	Ciechanowski
geo	PL923	Płocki
geo	PL924	Ostrołęcki
geo	PL925	Siedlecki
geo	PL926	Żyrardowski
geo	PT	Portugal
geo	PT1	Continente
geo	PT11	Norte
geo	PT111	Alto Minho
geo	PT112	Cávado
geo	PT119	Ave
geo	PT11A	Área Metropolitana do Porto
geo	PT11B	Alto Tâmega e Barroso
geo	PT11C	Tâmega e Sousa
geo	PT11D	Douro
geo	PT11E	Terras de Trás-os-Montes
geo	PT15	Algarve

concept	code	name
geo	PT150	Algarve
geo	PT19	Centro (PT)
geo	PT191	Região de Aveiro
geo	PT192	Região de Coimbra
geo	PT193	Região de Leiria
geo	PT194	Viseu Dão Lafões
geo	PT195	Beira Baixa
geo	PT196	Beiras e Serra da Estrela
geo	PT1A	Grande Lisboa
geo	PT1A0	Grande Lisboa
geo	PT1B	Península de Setúbal
geo	PT1B0	Península de Setúbal
geo	PT1C	Alentejo
geo	PT1C1	Alentejo Litoral
geo	PT1C2	Baixo Alentejo
geo	PT1C3	Alto Alentejo
geo	PT1C4	Alentejo Central
geo	PT1D	Oeste e Vale do Tejo
geo	PT1D1	Oeste
geo	PT1D2	Médio Tejo
geo	PT1D3	Lezíria do Tejo
geo	PT2	Região Autónoma dos Açores
geo	PT20	Região Autónoma dos Açores
geo	PT200	Região Autónoma dos Açores
geo	PT3	Região Autónoma da Madeira

concept	code	name
geo	PT30	Região Autónoma da Madeira
geo	PT300	Região Autónoma da Madeira
geo	RO	Romania
geo	RO1	Macroregiunea Unu
geo	RO11	Nord-Vest
geo	RO111	Bihor
geo	RO112	Bistrița-Năsăud
geo	RO113	Cluj
geo	RO114	Maramureș
geo	RO115	Satu Mare
geo	RO116	Sălaj
geo	RO12	Centru
geo	RO121	Alba
geo	RO122	Brașov
geo	RO123	Covasna
geo	RO124	Harghita
geo	RO125	Mureș
geo	RO126	Sibiu
geo	RO2	Macroregiunea Doi
geo	RO21	Nord-Est
geo	RO211	Bacău
geo	RO212	Botoșani
geo	RO213	Iași
geo	RO214	Neamț
geo	RO215	Suceava
geo	RO216	Vaslui

concept	code	name
geo	RO22	Sud-Est
geo	RO221	Brăila
geo	RO222	Buzău
geo	RO223	Constanța
geo	RO224	Galați
geo	RO225	Tulcea
geo	RO226	Vrancea
geo	RO3	Macroregiunea Trei
geo	RO31	Sud-Muntenia
geo	RO311	Argeș
geo	RO312	Călărași
geo	RO313	Dâmbovița
geo	RO314	Giurgiu
geo	RO315	Ialomița
geo	RO316	Prahova
geo	RO317	Teleorman
geo	RO32	București-Ilfov
geo	RO321	București
geo	RO322	Ilfov
geo	RO4	Macroregiunea Patru
geo	RO41	Sud-Vest Oltenia
geo	RO411	Dolj
geo	RO412	Gorj
geo	RO413	Mehedinți
geo	RO414	Olt
geo	RO415	Vâlcea
geo	RO42	Vest



concept	code	name
geo	RO421	Arad
geo	RO422	Caraș-Severin
geo	RO423	Hunedoara
geo	RO424	Timiș
geo	SI	Slovenia
geo	SI0	Slovenija
geo	SI03	Vzhodna Slovenija
geo	SI031	Pomurska
geo	SI032	Podravska
geo	SI033	Koroška
geo	SI034	Savinjska
geo	SI035	Zasavska
geo	SI036	Posavska
geo	SI037	Jugovzhodna Slovenija
geo	SI038	Primorsko-notranjska
geo	SI04	Zahodna Slovenija
geo	SI041	Osrednjeslovenska
geo	SI042	Gorenjska
geo	SI043	Goriška
geo	SI044	Obalno-kraška
geo	SK	Slovakia
geo	SK0	Slovensko
geo	SK01	Bratislavský kraj
geo	SK010	Bratislavský kraj
geo	SK02	Západné Slovensko
geo	SK021	Trnavský kraj
geo	SK022	Trenčiansky kraj

concept	code	name
geo	SK023	Nitriansky kraj
geo	SK03	Stredné Slovensko
geo	SK031	Žilinský kraj
geo	SK032	Banskobystrický kraj
geo	SK04	Východné Slovensko
geo	SK041	Prešovský kraj
geo	SK042	Košický kraj
geo	FI	Finland
geo	FI1	Manner-Suomi
geo	FI19	Länsi-Suomi
geo	FI196	Satakunta
geo	FI198	Keski-Suomi
geo	FI199	Etelä-Pohjanmaa
geo	FI19A	Pohjanmaa
geo	FI19B	Pirkanmaa
geo	FI1B	Helsinki-Uusimaa
geo	FI1B1	Helsinki-Uusimaa
geo	FI1C	Etelä-Suomi
geo	FI1C1	Varsinais-Suomi
geo	FI1C2	Kanta-Häme
geo	FI1C5	Etelä-Karjala
geo	FI1C6	Päijät-Häme
geo	FI1C7	Kymenlaakso
geo	FI1D	Pohjois- ja Itä-Suomi
geo	FI1D5	Keski-Pohjanmaa
geo	FI1D7	Lappi
geo	FI1D8	Kainuu

concept	code	name
geo	FI1D9	Pohjois-Pohjanmaa
geo	FI1DA	Etelä-Savo
geo	FI1DB	Pohjois-Savo
geo	FI1DC	Pohjois-Karjala
geo	FI2	Åland
geo	FI20	Åland
geo	FI200	Åland
geo	SE	Sweden
geo	SE1	Östra Sverige
geo	SE11	Stockholm
geo	SE110	Stockholms län
geo	SE12	Östra Mellansverige
geo	SE121	Uppsala län
geo	SE122	Södermanlands län
geo	SE123	Östergötlands län
geo	SE124	Örebro län
geo	SE125	Västmanlands län
geo	SE2	Södra Sverige
geo	SE21	Småland med öarna
geo	SE211	Jönköpings län
geo	SE212	Kronobergs län
geo	SE213	Kalmar län
geo	SE214	Gotlands län
geo	SE22	Sydsverige
geo	SE221	Blekinge län
geo	SE224	Skåne län
geo	SE23	Västsverige

concept	code	name
geo	SE231	Hallands län
geo	SE232	Västra Götalands län
geo	SE3	Norra Sverige
geo	SE31	Norra Mellansverige
geo	SE311	Värmlands län
geo	SE312	Dalarnas län
geo	SE313	Gävleborgs län
geo	SE32	Mellersta Norrland
geo	SE321	Västernorrlands län
geo	SE322	Jämtlands län
geo	SE33	Övre Norrland
geo	SE331	Västerbottens län
geo	SE332	Norrbottens län
geo	NO	Norway
geo	NO0	Norge
geo	NO02	Innlandet
geo	NO020	Innlandet
geo	NO06	Trøndelag
geo	NO060	Trøndelag/Tröndelage
geo	NO07	Nord-Norge
geo	NO071	Nordland/Nordlännda
geo	NO08	Oslo og Viken
geo	NO081	Oslo
geo	NO09	Agder og Sør-Østlandet
geo	NO092	Agder
geo	NO0A	Vestlandet
geo	NO0A1	Rogaland

concept	code	name
geo	NO0A2	Vestland
geo	NO0A3	Møre og Romsdal
geo	NO0B	Svalbard og Jan Mayen
geo	NO0B2	Svalbard
geo	NOZ	Extra-Regio level 1
geo	NOZZ	Extra-Regio level 2
geo	NOZZZ	Extra-Regio level 3
geo	CH	Switzerland
geo	CH0	Schweiz/Suisse/Svizzera
geo	CH01	Région lémanique
geo	CH011	Vaud
geo	CH012	Valais / Wallis
geo	CH013	Genève
geo	CH02	Espace Mittelland
geo	CH021	Bern / Berne
geo	CH022	Fribourg / Freiburg
geo	CH023	Solothurn
geo	CH024	Neuchâtel
geo	CH025	Jura
geo	CH03	Nordwestschweiz
geo	CH031	Basel-Stadt
geo	CH032	Basel-Landschaft
geo	CH033	Aargau
geo	CH04	Zürich
geo	CH040	Zürich
geo	CH05	Ostschweiz
geo	CH051	Glarus

concept	code	name
geo	CH052	Schaffhausen
geo	CH053	Appenzell Ausserrhoden
geo	CH054	Appenzell Innerrhoden
geo	CH055	St. Gallen
geo	CH056	Graubünden / Grigioni / Grischun
geo	CH057	Thurgau
geo	CH06	Zentralschweiz
geo	CH061	Luzern
geo	CH062	Uri
geo	CH063	Schwyz
geo	CH064	Obwalden
geo	CH065	Nidwalden
geo	CH066	Zug
geo	CH07	Ticino
geo	CH070	Ticino
geo	ME	Montenegro
geo	ME0	Crna Gora
geo	ME00	Crna Gora
geo	ME000	Crna Gora
geo	MK	North Macedonia
geo	MK0	Severna Makedonija
geo	MK00	Severna Makedonija
geo	MK001	Vardarski
geo	MK002	Istočen
geo	MK003	Jugozapaden
geo	MK004	Jugoistočen
geo	MK005	Pelagoniski

concept	code	name
geo	MK006	Pološki
geo	MK007	Severoistočen
geo	MK008	Skopski
geo	AL	Albania
geo	AL0	Shqipëria
geo	AL01	Veri
geo	AL011	Dibër
geo	AL012	Durrës
geo	AL013	Kukës
geo	AL014	Lezhë
geo	AL015	Shkodër
geo	AL02	Qender
geo	AL021	Elbasan
geo	AL022	Tiranë
geo	AL03	Jug
geo	AL031	Berat
geo	AL032	Fier
geo	AL033	Gjirokastër
geo	AL034	Korçë
geo	AL035	Vlorë
geo	RS	Serbia
geo	RS1	Srbija - sever
geo	RS11	Beogradski region
geo	RS110	Beogradska oblast
geo	RS12	Region Vojvodine
geo	RS121	Zapadnobacka oblast
geo	RS122	Juznobanatska oblast

concept	code	name
geo	RS123	Juznobacka oblast
geo	RS124	Severnobanatska oblast
geo	RS125	Severnobacka oblast
geo	RS126	Srednjobanatska oblast
geo	RS127	Sremska oblast
geo	RS2	Srbija - jug
geo	RS21	Region Sumadije i Zapadne Srbije
geo	RS211	Zlatiborska oblast
geo	RS212	Kolubarska oblast
geo	RS213	Macvanska oblast
geo	RS214	Moravicka oblast
geo	RS215	Pomoravska oblast
geo	RS216	Rasinska oblast
geo	RS217	Raska oblast
geo	RS218	Sumadijska oblast
geo	RS22	Region Juzne i Istocne Srbije
geo	RS221	Borska oblast
geo	RS222	Branicevska oblast
geo	RS223	Zajecarska oblast
geo	RS224	Jablanicka oblast
geo	RS225	Nisavska oblast
geo	RS226	Pirotska oblast
geo	RS227	Podunavska oblast
geo	RS228	Pcinjska oblast
geo	RS229	Toplicka oblast
geo	TR	Türkiye
geo	TR1	İstanbul



concept	code	name
geo	TR10	İstanbul
geo	TR100	İstanbul
geo	TR2	Batı Marmara
geo	TR21	Tekirdağ, Edirne, Kırklareli
geo	TR211	Tekirdağ
geo	TR212	Edirne
geo	TR213	Kırklareli
geo	TR22	Balıkesir, Çanakkale
geo	TR221	Balıkesir
geo	TR222	Çanakkale
geo	TR3	Ege
geo	TR31	İzmir
geo	TR310	İzmir
geo	TR32	Aydın, Denizli, Muğla
geo	TR321	Aydın
geo	TR322	Denizli
geo	TR323	Muğla
geo	TR33	Manisa, Afyonkarahisar, Kütahya, Uşak
geo	TR331	Manisa
geo	TR332	Afyonkarahisar
geo	TR333	Kütahya
geo	TR334	Uşak
geo	TR4	Doğu Marmara
geo	TR41	Bursa, Eskişehir, Bilecik
geo	TR411	Bursa
geo	TR412	Eskişehir
geo	TR413	Bilecik

concept	code	name
geo	TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova
geo	TR421	Kocaeli
geo	TR422	Sakarya
geo	TR423	Düzce
geo	TR424	Bolu
geo	TR425	Yalova
geo	TR5	Batı Anadolu
geo	TR51	Ankara
geo	TR510	Ankara
geo	TR52	Konya, Karaman
geo	TR521	Konya
geo	TR522	Karaman
geo	TR6	Akdeniz
geo	TR61	Antalya, Isparta, Burdur
geo	TR611	Antalya
geo	TR612	Isparta
geo	TR613	Burdur
geo	TR62	Adana, Mersin
geo	TR621	Adana
geo	TR622	Mersin
geo	TR63	Hatay, Kahramanmaraş, Osmaniye
geo	TR631	Hatay
geo	TR632	Kahramanmaraş
geo	TR633	Osmaniye
geo	TR7	Orta Anadolu

concept	code	name
geo	TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir
geo	TR711	Kırıkkale
geo	TR712	Aksaray
geo	TR713	Niğde
geo	TR714	Nevşehir
geo	TR715	Kırşehir
geo	TR72	Kayseri, Sivas, Yozgat
geo	TR721	Kayseri
geo	TR722	Sivas
geo	TR723	Yozgat
geo	TR8	Batı Karadeniz
geo	TR81	Zonguldak, Karabük, Bartın
geo	TR811	Zonguldak
geo	TR812	Karabük
geo	TR813	Bartın
geo	TR82	Kastamonu, Çankırı, Sinop
geo	TR821	Kastamonu
geo	TR822	Çankırı
geo	TR823	Sinop
geo	TR83	Samsun, Tokat, Çorum, Amasya
geo	TR831	Samsun
geo	TR832	Tokat
geo	TR833	Çorum
geo	TR834	Amasya
geo	TR9	Doğu Karadeniz

concept	code	name
geo	TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane
geo	TR901	Trabzon
geo	TR902	Ordu
geo	TR903	Giresun
geo	TR904	Rize
geo	TR905	Artvin
geo	TR906	Gümüşhane
geo	TRA	Kuzeydoğu Anadolu
geo	TRA1	Erzurum, Erzincan, Bayburt
geo	TRA11	Erzurum
geo	TRA12	Erzincan
geo	TRA13	Bayburt
geo	TRA2	Ağrı, Kars, Iğdır, Ardahan
geo	TRA21	Ağrı
geo	TRA22	Kars
geo	TRA23	Iğdır
geo	TRA24	Ardahan
geo	TRB	Ortadoğu Anadolu
geo	TRB1	Malatya, Elazığ, Bingöl, Tunceli
geo	TRB11	Malatya
geo	TRB12	Elazığ
geo	TRB13	Bingöl
geo	TRB14	Tunceli
geo	TRB2	Van, Muş, Bitlis, Hakkari
geo	TRB21	Van
geo	TRB22	Muş

concept	code	name
geo	TRB23	Bitlis
geo	TRB24	Hakkari
geo	TRC	Güneydoğu Anadolu
geo	TRC1	Gaziantep, Adıyaman, Kilis
geo	TRC11	Gaziantep
geo	TRC12	Adıyaman
geo	TRC13	Kilis
geo	TRC2	Şanlıurfa, Diyarbakır
geo	TRC21	Şanlıurfa
geo	TRC22	Diyarbakır
geo	TRC3	Mardin, Batman, Şırnak, Siirt
geo	TRC31	Mardin
geo	TRC32	Batman
geo	TRC33	Şırnak
geo	TRC34	Siirt

```
# Bruk DSD-informasjonen til å laste ned pop-data på NUTS3-nivå
pop <- get_eurostat_data(
  id = "nama_10r_3popgdp",
  filters = list(
    freq = "A",      # Annual
    unit = "THS"     # Thousand (jf. DSD-tabellen over)
  ),
  exact_match = FALSE,
  date_filter = 2000:2023,
  stringsAsFactors = FALSE
) |>
mutate(pop_n3 = 1000 * values) |>
select(geo, time, pop_n3) |>
filter(str_length(geo) == 5) |>
as_tibble()
```

```
dim(pop)
```

```
[1] 30038      3
```

```
pop
```

```
# A tibble: 30,038 x 3
  geo    time  pop_n3
  <chr> <chr>  <dbl>
1 AL011 2001   186720
2 AL011 2002   182380
3 AL011 2003   178710
4 AL011 2004   174710
5 AL011 2005   170370
6 AL011 2006   165610
7 AL011 2007   160540
8 AL011 2008   155390
9 AL011 2009   150430
10 AL011 2010   146140
# i 30,028 more rows
```

### Oppgave 3

```
# Slå sammen GDP- og befolkningstabellene
# Viktig: gdp skal være venstre tabell
```

```
gdp_pop <- gdp |>
  left_join(pop, by = c("geo", "time"))
```

```
eu_data <- gdp_pop %>%
  # Trenger ikke ZZ sonene som er en slag oppsamlingssone
  # for ikke fordelte verdier
  filter(!str_sub(geo, 3, 4) == "ZZ") |>
  # Drop the EFTA countries Switzerland and Norway
  filter(!str_sub(geo, 1, 2) %in% c("CH", "NO")) |>
  # Drop the EU countries Netherlands and Portugal
  filter(!str_sub(geo, 1, 2) %in% c("NL", "PT")) |>
  # Drop candidate country Monte Negro because of data
  filter(!str_sub(geo, 1, 2) %in% c("ME")) |>
```

```
# Drop a region of France in the Indian Ocean (Outre Mer); Mayotte
# because of missing data
filter(!geo == "FRY50") |>
# note that a few countries will have missing data for
# some years at the start of the period
filter(time > 1999 & time < 2023)
```

```
eu_data <- eu_data |>
  mutate(
    gdp_pc_n3 = gdp_n3 / pop_n3
  )
```

```
dim(eu_data)
```

```
[1] 27584      5
```

```
dim(
  eu_data |>
    filter(is.na(gdp_pc_n3))
)
```

```
[1] 0 5
```

## Oppgave 4

```
# Endre geo til n3 og lag variablene n2, n1 og nc

eu_data <- eu_data |>
  # Endrer navnet fra geo til n3
  rename(n3 = geo) |>

  # Lager nye variabler basert på n3-koden
  mutate(
    n2 = str_sub(n3, 1, 4), # NUTS2: første 4 tegn
    n1 = str_sub(n3, 1, 3), # NUTS1: første 3 tegn
    nc = str_sub(n3, 1, 2)  # Landskode: første 2 tegn
  )
```

```
eu_data |>
  select(n3, n2, n1, nc) |>
  head(10)
```

```
# A tibble: 10 x 4
   n3     n2     n1     nc
  <chr> <chr> <chr> <chr>
1 AL011 AL01  AL0   AL
2 AL011 AL01  AL0   AL
3 AL011 AL01  AL0   AL
4 AL011 AL01  AL0   AL
5 AL011 AL01  AL0   AL
6 AL011 AL01  AL0   AL
7 AL011 AL01  AL0   AL
8 AL011 AL01  AL0   AL
9 AL011 AL01  AL0   AL
10 AL011 AL01  AL0   AL
```

## Oppgave 5

```
# Sjekk om noen NUTS3-soner har pop_n3 lik 0, og sett disse til NA

# Sjekker om det finnes verdier som er 0
sum(eu_data$pop_n3 == 0, na.rm = TRUE)
```

```
[1] 0
```

```
# Setter pop_n3 = 0 til NA dersom slike finnes
eu_data <- eu_data |>
  mutate(
    pop_n3 = ifelse(pop_n3 == 0, NA, pop_n3)
  )
```

## Oppgave 6



```

# Teller antall unike NUTS3-soner i hvert land
nuts3_per_land <- eu_data |>
  group_by(nc) |>
  summarise(Antall = n_distinct(n3)) |>
  arrange(nc)

# Teller hvor mange land (nc) vi har totalt
n_lands <- nuts3_per_land |> summarise(n = n()) |> pull(n)

# Lager flextable og legger til en footer med "n: xx"
flextable_nuts3 <- nuts3_per_land |>
  flextable() |>
  width(j = 1, width = 1) |>
  width(j = 2, width = 1) |>
  add_footer_lines(values = paste0("n: ", n_lands)) |>
  align(align = "left", part = "footer")

flextable_nuts3

```

nc	Antall
AL	12
AT	35
BE	44
BG	28
CY	1
CZ	14
DE	400
DK	11
EE	5
EL	52
ES	59
FI	19
FR	100
HR	21

nc	Antall
HU	20
IE	8
IT	107
LT	10
LU	1
LV	5
MK	8
MT	2
PL	73
RO	42
RS	25
SE	21
SI	12
SK	8
TR	81
n: 29	

## Oppgave 7

```
# Sjekk summary for gdp_pc_n3
# Viser et standard summary for variabelen gdp_pc_n3
summary(eu_data$gdp_pc_n3)
```

```
      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 2214    14994   21144   22782   27952  180416
```

```
# Minste verdi
min_gdp_pc <- min(eu_data$gdp_pc_n3, na.rm = TRUE)
min_gdp_pc
```

```
[1] 2214.485
```

```
# Største verdi
max_gdp_pc <- max(eu_data$gdp_pc_n3, na.rm = TRUE)
max_gdp_pc
```

```
[1] 180415.8
```

```
# Antall NA-verdier i gdp_pc_n3
sum(is.na(eu_data$gdp_pc_n3))
```

```
[1] 0
```

Datasettet `gdp_pc_n3` har 0 NAV-verdie, og den minste verdien er 2214, mens den største verdien er 180416.

## Oppgave 8

```
# Legg til variabelen nc_name basert på landskode (nc)

eu_data <- eu_data |>
  mutate(
    nc_name = case_when(
      nc == "AL" ~ "Albania",
      nc == "AT" ~ "Østerrike",
      nc == "BE" ~ "Belgia",
      nc == "BG" ~ "Bulgaria",
      nc == "CY" ~ "Kypros",
      nc == "CZ" ~ "Tjekkia",
      nc == "DE" ~ "Tyskland",
      nc == "DK" ~ "Danmark",
      nc == "EE" ~ "Estland",
      nc == "EL" ~ "Hellas",
      nc == "ES" ~ "Spania",
      nc == "FI" ~ "Finland",
      nc == "FR" ~ "Frankrike",
      nc == "HR" ~ "Kroatia",
      nc == "HU" ~ "Ungarn",
      nc == "IE" ~ "Irland",
      nc == "IT" ~ "Italia",
      nc == "LT" ~ "Litauen",
```

```

nc == "LU" ~ "Luxembourg",
nc == "LV" ~ "Latvia",
nc == "MK" ~ "Nord-Makedonia",
nc == "MT" ~ "Malta",
nc == "PL" ~ "Polen",
nc == "RO" ~ "Romania",
nc == "RS" ~ "Serbia",
nc == "SE" ~ "Sverige",
nc == "SI" ~ "Slovenia",
nc == "SK" ~ "Slovakia",
nc == "TR" ~ "Tyrkia",
TRUE ~ NA_character_
)
)

```

```

eu_data |>
  select(nc_name, nc) |>
  distinct() |>
  print(n = 30)

```

```

# A tibble: 29 x 2
  nc_name      nc
  <chr>      <chr>
1 Albania    AL
2 Østerrike  AT
3 Belgia     BE
4 Bulgaria   BG
5 Kypros     CY
6 Tjekkia    CZ
7 Tyskland   DE
8 Danmark    DK
9 Estland    EE
10 Hellas    EL
11 Spania     ES
12 Finland   FI
13 Frankrike  FR
14 Kroatia    HR
15 Ungarn     HU
16 Irland     IE
17 Italia     IT
18 Litauen    LT
19 Luxembourg LU

```

20	Latvia	LV
21	Nord-Makedonia	MK
22	Malta	MT
23	Polen	PL
24	Romania	RO
25	Serbia	RS
26	Sverige	SE
27	Slovenia	SI
28	Slovakia	SK
29	Tyrkia	TR

## Beregning av Gini på NUTS2, NUTS1 og NUTSc nivå

### Oppgave 9

```
# Beregne Gini-koeffisienter på NUTS2 nivå

gini_n2 <- eu_data |>
  group_by(n2, time, n1, nc, nc_name) |>
  summarise(
    gini_n2 = DescTools::Gini(gdp_pc_n3, weights = pop_n3, na.rm = TRUE),
    pop_n2 = sum(pop_n3),
    gdp_n2 = sum(gdp_n3),
    gdp_pc_n2 = gdp_n2 / pop_n2,
    num_reg_n2 = n(),
    .groups = "drop"
  )

# Kort oversikt
gini_n2 |>
  select(gini_n2, num_reg_n2, gdp_n2, pop_n2, gdp_pc_n2) |>
  summary()
```

gini_n2	num_reg_n2	gdp_n2	pop_n2
Min. :0.00038	Min. : 1.000	Min. :6.814e+08	Min. : 25740
1st Qu.:0.06753	1st Qu.: 2.000	1st Qu.:1.595e+10	1st Qu.: 992732
Median :0.10893	Median : 4.000	Median :3.030e+10	Median : 1529210
Mean :0.12316	Mean : 4.819	Mean :4.679e+10	Mean : 1947314
3rd Qu.:0.16290	3rd Qu.: 6.000	3rd Qu.:5.388e+10	3rd Qu.: 2361818
Max. :0.47793	Max. :23.000	Max. :7.083e+11	Max. :15874440

```

NA's      :856
  gdp_pc_n2
Min.      : 3157
1st Qu.   :15317
Median    :21839
Mean      :23011
3rd Qu.   :28793
Max.      :96746

```

## Oppgave 10

```

gini_n2 |>
  filter(gini_n2 < 0.001) |>
  arrange(num_reg_n2) |>
  select(nc_name, nc, n1, n2, time, gini_n2, num_reg_n2) |>
  print(n = 10)

```

```

# A tibble: 4 x 7
  nc_name  nc   n1   n2   time  gini_n2 num_reg_n2
  <chr>   <chr> <chr> <chr> <chr>   <dbl>     <int>
1 Danmark DK   DK0   DK02  2019  0.000977       2
2 Italia  IT   ITF   ITF5  2006  0.000545       2
3 Polen   PL   PL4   PL43  2011  0.000854       2
4 Slovakia SK   SK0   SK03  2004  0.000379       2

```

Disse regionene består av svært få NUTS3-soner, og lav Gini skyldes derfor datastrukturen snarere enn reelle regionale forskjeller.

## Oppgave 11

```

# Beregner Gini-koeffisienter og økonomiske nøkkeltall på NUTS1 nivå
gini_n1 <- eu_data |>
  group_by(n1, time, nc, nc_name) |>
  summarise(
    gini_n1 = DescTools::Gini(gdp_pc_n3, weights = pop_n3, na.rm = TRUE),
    pop_n1  = sum(pop_n3),
    gdp_n1  = sum(gdp_n3),

```

```

    gdp_pc_n1 = gdp_n1 / pop_n1,
    num_reg_n1 = n(),
    .groups = "drop"
  )

# Summary
gini_n1 |>
  select(gini_n1, num_reg_n1, gdp_n1, pop_n1, gdp_pc_n1) |>
  summary() |>
  print(width = 76)

```

gini_n1		num_reg_n1		gdp_n1		pop_n1	
Min.	:0.01601	Min.	: 1.00	Min.	:6.814e+08	Min.	: 25740
1st Qu.	:0.09123	1st Qu.	: 6.00	1st Qu.	:4.256e+10	1st Qu.	: 2689490
Median	:0.13959	Median	: 9.00	Median	:7.888e+10	Median	: 3934280
Mean	:0.15364	Mean	:12.22	Mean	:1.187e+11	Mean	: 4938602
3rd Qu.	:0.18790	3rd Qu.	:14.00	3rd Qu.	:1.411e+11	3rd Qu.	: 5992840
Max.	:0.42934	Max.	:96.00	Max.	:7.287e+11	Max.	:18031860
NA's	:177						

gdp_pc_n1	
Min.	: 3802
1st Qu.	:15750
Median	:22295
Mean	:23523
3rd Qu.	:29340
Max.	:90512

## Oppgave 12

```

# Beregner Gini-koeffisienter på landsnivå (NUTSc), basert på NUTS3-verdier
gini_nc <- eu_data |>
  group_by(nc, nc_name, time) |>
  summarise(
    gini_nc = DescTools::Gini(gdp_pc_n3, weights = pop_n3, na.rm = TRUE),
    pop_nc = sum(pop_n3),
    gdp_nc = sum(gdp_n3),
    gdp_pc_nc = gdp_nc / pop_nc,
    num_reg_nc = n(), # antall NUTS3 i landet
    .groups = "drop"
  )

```

```
)

# Summary
gini_nc |>
  select(gini_nc, num_reg_nc, gdp_nc, pop_nc, gdp_pc_nc) |>
  summary() |>
  print(width = 80)
```

gini_nc		num_reg_nc		gdp_nc		pop_nc	
Min.	:0.1111	Min.	: 1.00	Min.	:5.892e+09	Min.	: 386200
1st Qu.	:0.1742	1st Qu.	: 8.00	1st Qu.	:4.350e+10	1st Qu.	: 2810745
Median	:0.2094	Median	: 20.00	Median	:1.516e+11	Median	: 6984230
Mean	:0.2149	Mean	: 42.37	Mean	:4.114e+11	Mean	:17122006
3rd Qu.	:0.2553	3rd Qu.	: 44.00	3rd Qu.	:3.447e+11	3rd Qu.	:11352985
Max.	:0.3991	Max.	:400.00	Max.	:3.550e+12	Max.	:84979990
NA's :46							
gdp_pc_nc							
Min.		: 4854					
1st Qu.		:15103					
Median		:22224					
Mean		:23761					
3rd Qu.		:29362					
Max.		:90512					

## «Nestete» datastrukturer

### Oppgave 13

```
# Nest dataene på NUTS3 nivå
gini_n3_nest <- eu_data |>
  group_by(nc_name, nc) |>
  nest(.key = "NUTS3_data") |>
  ungroup()
```



## Oppgave 14

```
gini_NUTS2_nest <- gini_n2 |>
  group_by(nc_name, nc) |>
  nest(.key = "NUTS2_data") |>
  ungroup()
```

## Oppgave 15

```
gini_NUTS1_nest <- gini_n1 |>
  group_by(nc_name, nc) |>
  nest(.key = "NUTS1_data") |>
  ungroup()
```

## Oppgave 16

```
gini_NUTSc_nest <- gini_nc |>
  group_by(nc_name, nc) |>
  nest(.key = "NUTSc_data") |>
  ungroup()
```

## Oppgave 17

```
gini_NUTSeu_nest <- eu_data |>
  group_by(time) |>
  summarise(
    gini_eu = DescTools::Gini(gdp_pc_n3, weights = pop_n3, na.rm = TRUE),
    num_reg_eu = n(),
    .groups = "drop"
  )
```

## Oppgave 18

```
gini_NUTSeu_nest <- gini_NUTSeu_nest |>
  mutate(time = as.numeric(time))
```

```
ggplot(gini_NUTSeu_nest, aes(x = time, y = gini_eu)) +
  geom_line() +
  theme_minimal() +
  labs(
    title = "Regional ulikhet i EU",
    x = "Year",
    y = "gini_eu"
  )
```

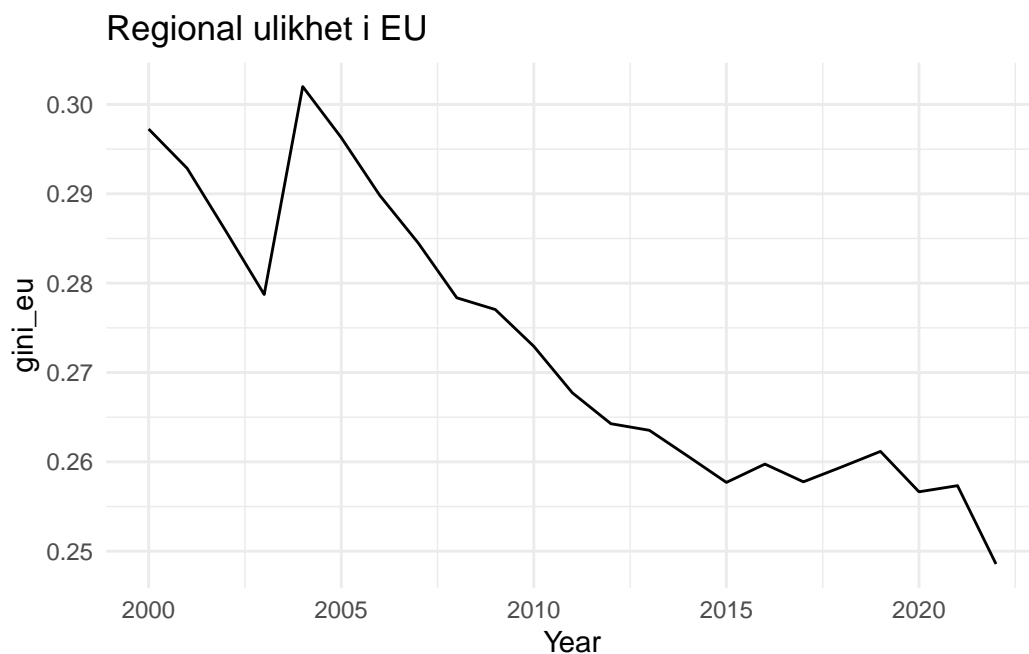


Figure 1: Utvikling i Gini-koeffisienten for NUTS3-regioner i EU.

## Oppgave 19

Gini-koeffisienten mellom NUTS3-regioner viser en tydelig fallende trend over tid, slik Figure 1 illustrerer. Dette innebærer at regionale forskjeller gradvis reduseres. En slik utvikling er i tråd med målet om å styrke mindre utviklede områder gjennom EUs strukturfond. Figure 1 indikerer også at tiltaket kan ha ønsket effekt.

## Oppgave 20

```
# Kombinerer  
eu_data_nested <- gini_n3_nest |>  
  left_join(gini_NUTS2_nest, by = c("nc", "nc_name")) |>  
  left_join(gini_NUTS1_nest, by = c("nc", "nc_name")) |>  
  left_join(gini_NUTSc_nest, by = c("nc", "nc_name"))
```

## Plots som viser utviklingen

### Oppgave 21

```
gini_nc |>  
  filter(!is.na(gini_nc)) |>  
  mutate(time = as.integer(time)) |>  
  ggplot(aes(  
    x = time,  
    y = gini_nc,  
    group = nc_name,  
    color = nc_name  
  )) +  
  geom_line() +  
  theme_minimal() +  
  labs(  
    title = "Regional ulikhet over tid",  
    x = "time",  
    y = "gini_nc",  
    color = "nc_name"  
  )
```

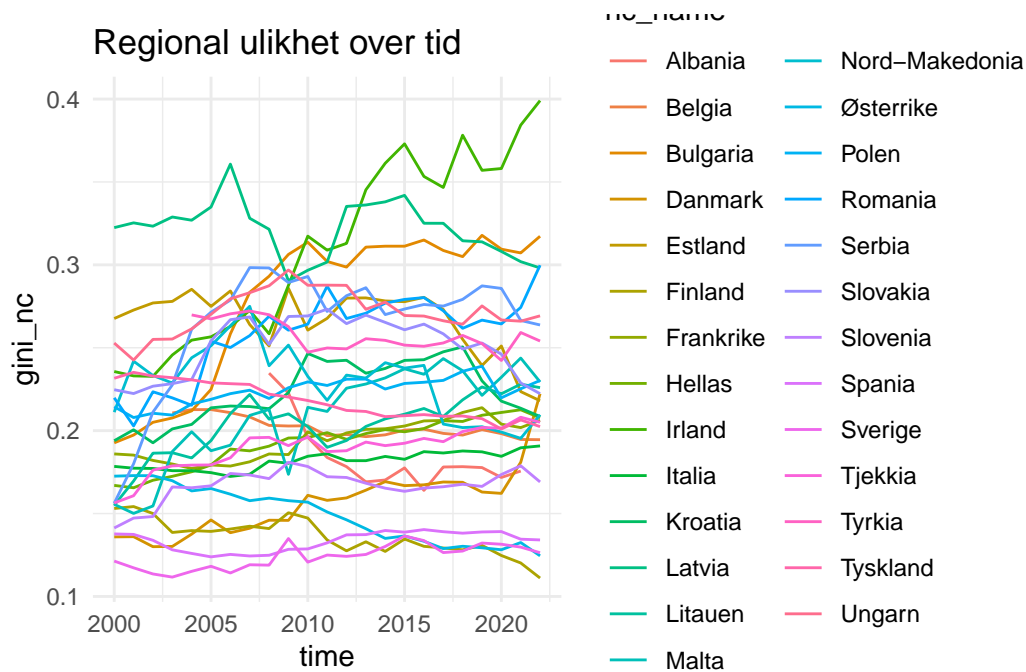


Figure 2: Utviklingen over tid for Gini-koeffisienten på nasjonsnivå for de 29 landene. Gini-koeffisienten måler hvordan verdiskapingen i landet er fordelt mellom NUTS3-regioner.

## Oppgave 22

```
gini_nc |>
  filter(time == 2022) |>
  arrange(desc(gini_nc)) |>
  select(nc_name, gini_nc) |>
  knitr::kable(digits = 7)
```

Table 7: Gini-koeffisient for BNP i 2022. Kypros og Luxembourg har bare en NUTS3-region og dermed ingen Gini-koeffisient.

nc_name	gini_nc
Irland	0.3990713
Bulgaria	0.3172612
Romania	0.2998082
Latvia	0.2981280

Table 7: Gini-koeffisient for BNP i 2022. Kypros og Luxembourg har bare en NUTS3-region og dermed ingen Gini-koeffisient.

nc_name	gini_nc
Ungarn	0.2692496
Serbia	0.2637424
Tyrkia	0.2540632
Polen	0.2302756
Malta	0.2294089
Litauen	0.2259366
Slovakia	0.2222795
Danmark	0.2222566
Estland	0.2180376
Nord-Makedonia	0.2095793
Kroatia	0.2085360
Hellas	0.2077325
Frankrike	0.2062529
Tjekkia	0.2050454
Tyskland	0.2024255
Belgia	0.1945446
Italia	0.1907755
Slovenia	0.1690681
Spania	0.1340889
Sverige	0.1263810
Østerrike	0.1244962
Finland	0.1111034
Kypros	NaN
Luxembourg	NaN

## Oppgave 23

```
gini_series <- gini_nc |>
  transmute(
    country = nc_name,
    year    = as.integer(time),
    gini     = gini_nc
  ) |>
  filter(!is.na(gini), !is.nan(gini)) |>
  arrange(country, year) |>
  group_by(country) |>
```

```
mutate(
  gini_first = first(gini),
  year_comp = if (any(year == 2022L)) 2022L else last(year),
  gini_comp = if (any(year == 2022L)) gini[year == 2022L][1] else last(gini),
  group      = if_else(gini_comp < gini_first, "Lower", "Higher")
) |>
ungroup()
```

```
gini_series |>
  filter(group == "Lower") |>
  ggplot(aes(year, gini, colour = country, group = country)) +
  geom_line() +
  labs(title = "Lavere regional ulikhet", x = "Year", y = "Gini-koeffisient", colour = "Land") +
  theme_minimal()
```

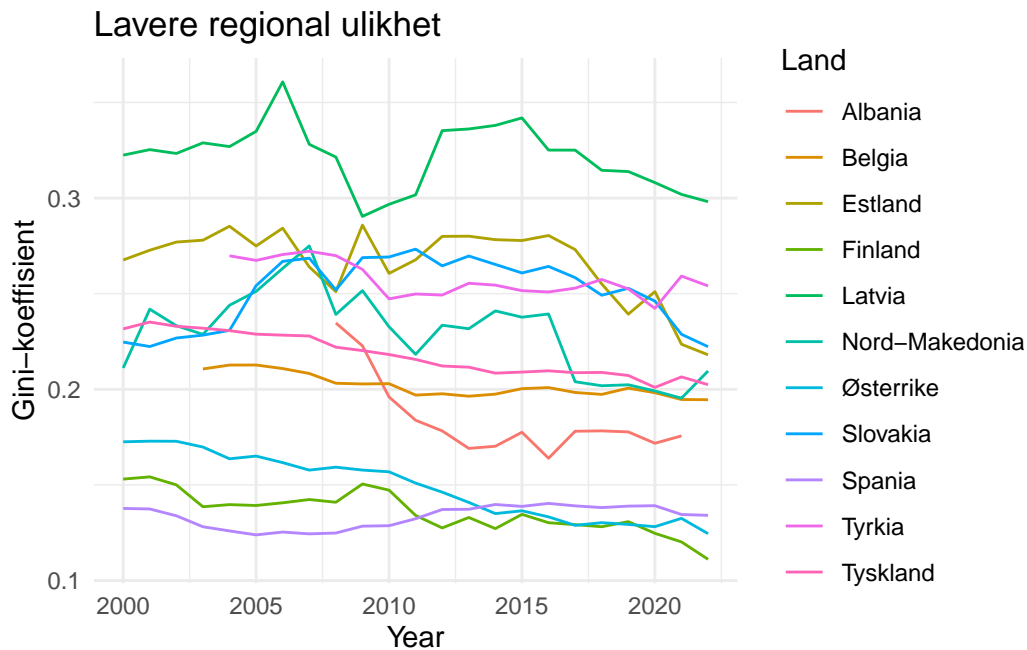


Figure 3: Land med lavere regional ulikhet i 2022 enn første år vi har data for.

```
gini_series |>
  filter(group == "Higher") |>
  ggplot(aes(year, gini, colour = country, group = country)) +
  geom_line() +
```

```
labs(title = "Høyere regional ulikhet", x = "Year", y = "Gini-koeffisient", colour = "Land") +
theme_minimal()
```

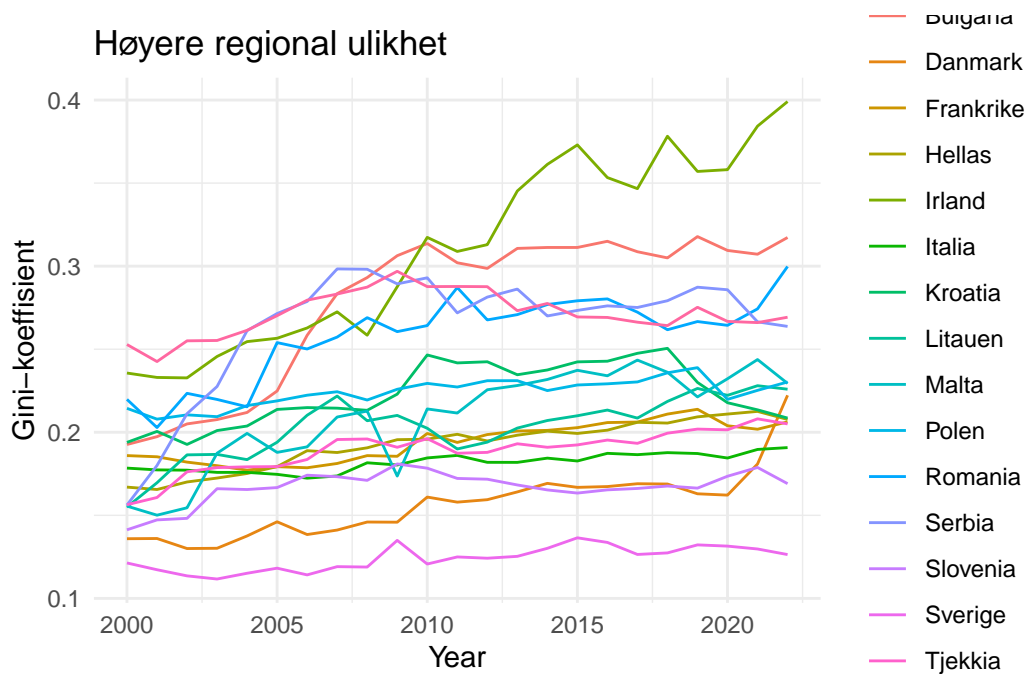


Figure 4: Land med høyere regional ulikhet i 2022 enn første år vi har data for.

## Oppgave 24

```
gini_n2 |>
  filter(nc == "IE", !is.na(gini_n2)) |>
  mutate(time = as.integer(time)) |>
  ggplot(aes(x = time, y = gini_n2, group = n2, color = n2)) +
  geom_line() +
  scale_x_continuous(
    breaks = seq(2000, 2022, by = 5)
  ) +
  theme_minimal() +
  labs(
    title = "Regional ulikhet i Irland",
    x = "Year",
```

```

y = "gini_n2",
color = "n2"
)

```

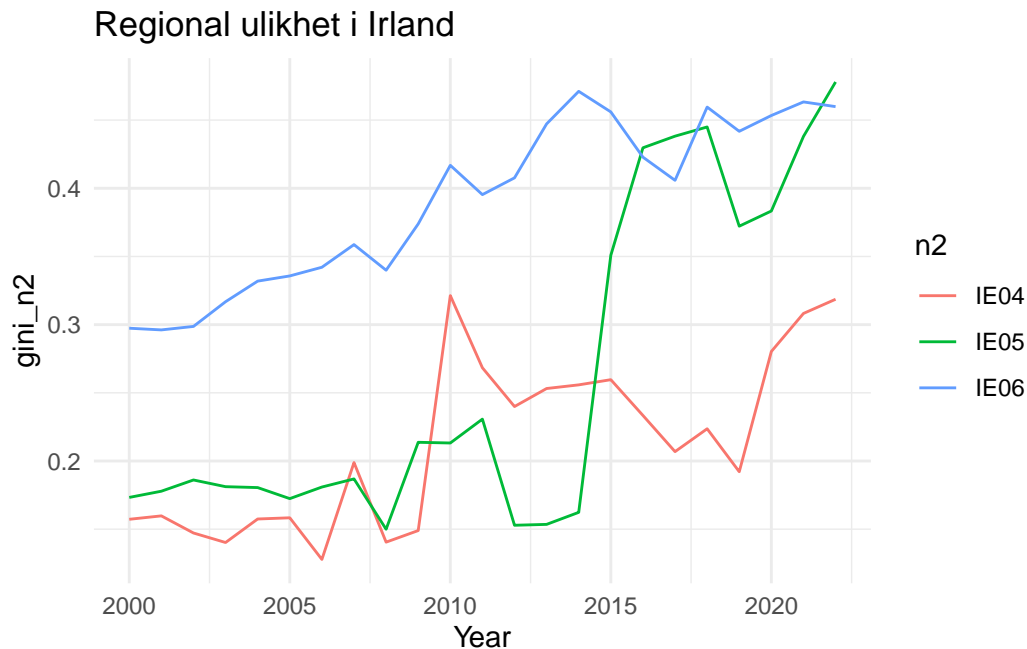


Figure 5: Utviklingen i Gini-koeffisienten for NUTS2-regionene i Irland.

## Hvordan er verdiskapningen fordelt mellom regionene i ulike land?

### Spania

### Oppgave 25

```

gini_n2 |>
  filter(nc == "ES", !is.na(gini_n2)) |>
  mutate(time = as.integer(time)) |>
  ggplot(aes(x = time, y = gini_n2, group = n2, colour = n2)) +
  geom_line() +
  scale_x_continuous(breaks = seq(2000, 2022, by = 5)) +
  labs(
    title = "Regional (NUTS2) ulikhet i Spania",

```



```

  x = "Year",
  y = "gini_n2",
  colour = "n2"
) +
theme_minimal() +
theme(
  legend.position = "bottom"
)

```

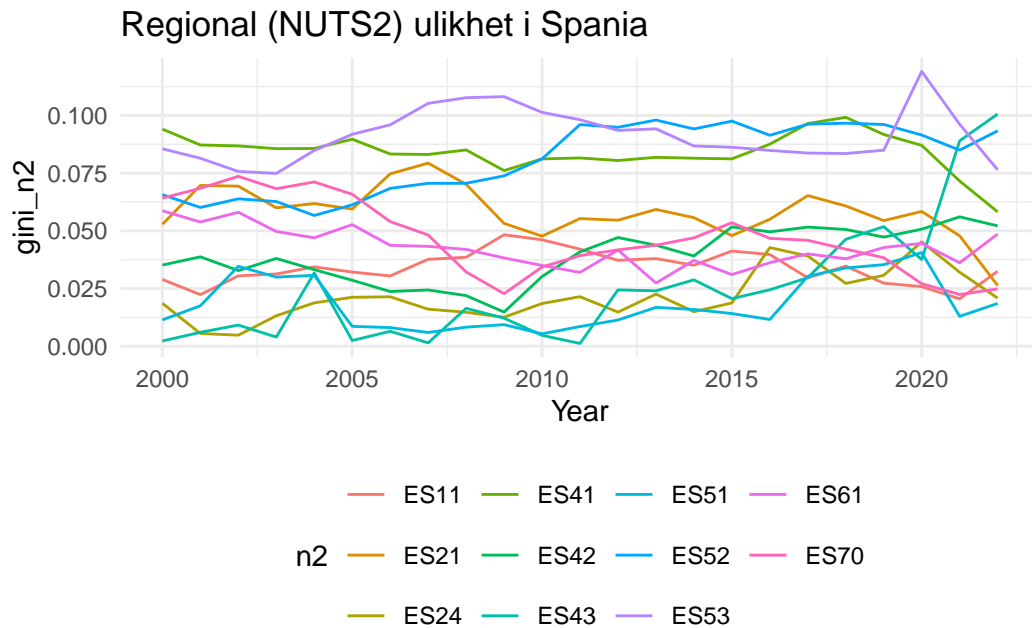


Figure 6: Utviklingen i Gini-koeffisienten for NUTS2-regionene i Spania.

## Oppgave 26

```

gini_n1 |>
  filter(nc == "ES", !is.na(gini_n1)) |>
  mutate(time = as.integer(time)) |>
  ggplot(aes(x = time, y = gini_n1, group = n1, colour = n1)) +
  geom_line() +
  scale_x_continuous(breaks = seq(2000, 2022, by = 5)) +
  labs(

```

```

title = "Regional (NUTS1) ulikhet i Spania",
x      = "Year",
y      = "gini_n1",
colour = "n1"
) +
theme_minimal() +
theme(legend.position = "bottom")

```

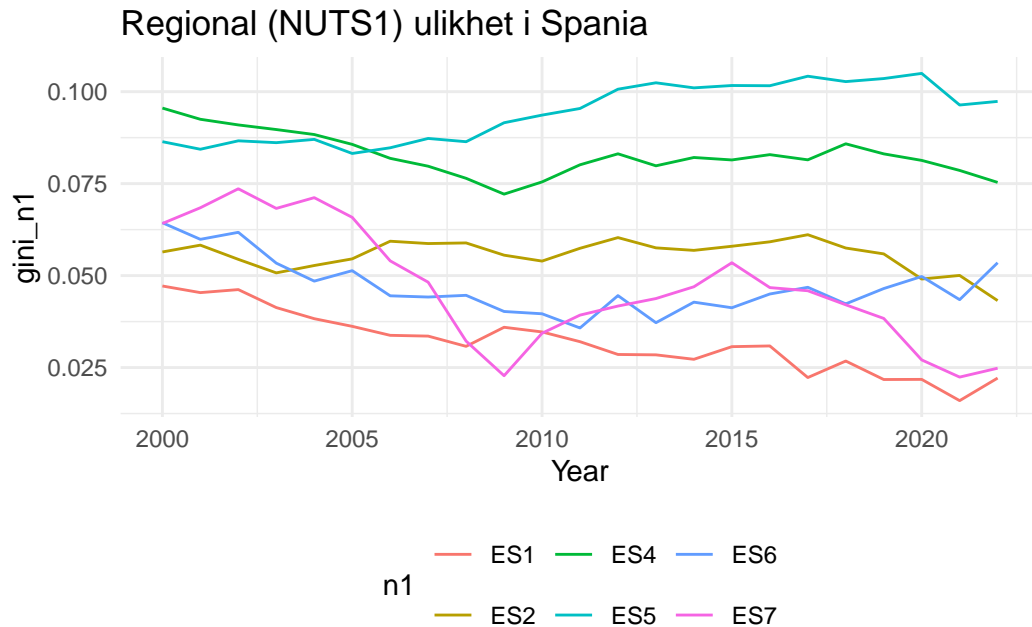


Figure 7: Utviklingen i Gini-koeffisienten for NUTS1-regionene i Spania.

NUTS1-regionene som har hatt økt utjevning kjennetegnes av en fallende eller stabil Gini-koeffisient over tid. Dette indikerer mindre forskjeller i verdiskaping mellom regionene innen disse områdene. Samtidig varierer utviklingen mellom regionene, og figuren alene gir ikke grunnlag for å trekke sterke konklusjoner om årsakene.

## Tyskland

### Oppgave 27

```
gini_n2 |>
  filter(nc == "DE", !is.na(gini_n2)) |>
  mutate(time = as.integer(time)) |>
  ggplot(aes(x = time, y = gini_n2, group = n2)) +
  geom_line(colour = "black", alpha = 0.7) +
  scale_x_continuous(breaks = seq(2000, 2022, by = 5)) +
  labs(
    title = "Regional (NUTS2) ulikhet i Tyskland",
    x = "Year",
    y = "gini_n2"
  ) +
  theme_minimal()
```

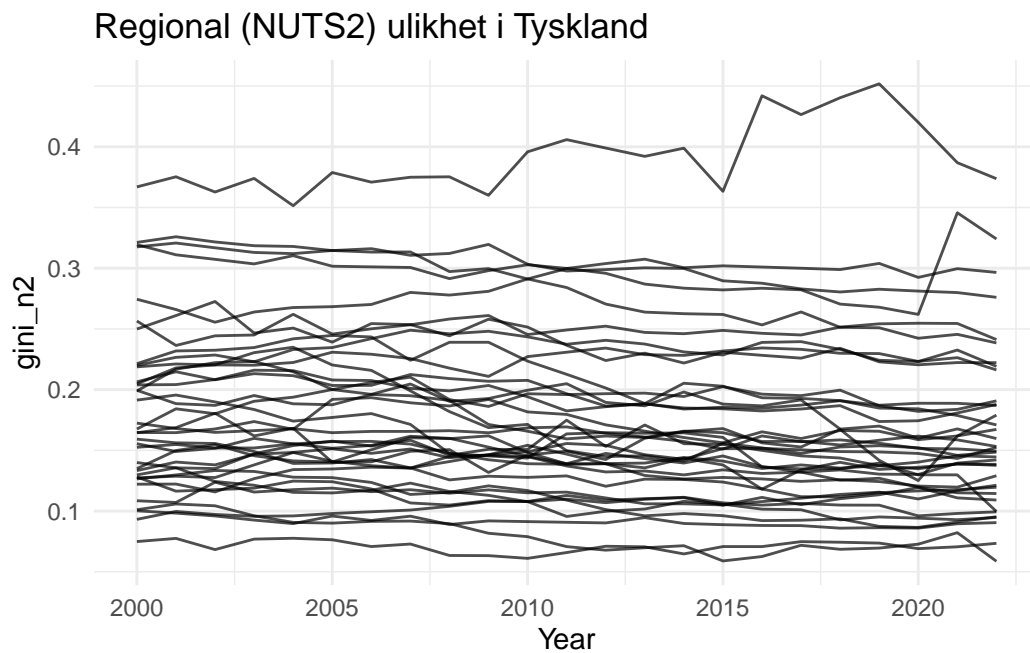


Figure 8: Utviklingen i Gini-koeffisienten for NUTS2-regionene i Tyskland.

```
# Finner NUTS2-regionen i Tyskland med høyest observert Gini-koeffisient.

gini_n2 |>
  filter(nc == "DE", !is.na(gini_n2)) |>
  group_by(n2) |>
  summarise(
```

```

    max_gini = max(gini_n2),
    .groups = "drop"
  ) |>
  arrange(desc(max_gini)) |>
  slice(1)

```

```

# A tibble: 1 x 2
  n2      max_gini
<chr>    <dbl>
1 DE91      0.452

```

Fra Figure 8 ser vi at Gini-koeffisientene for NUTS2-regionene i Tyskland i analyseperioden varierer omtrent fra 0,03 til over 0,45, noe som indikerer betydelige forskjeller mellom regionene. Enkelte NUTS2-regioner har gjennom hele perioden Gini-koeffisienter som ligger klart høyere enn øvrige regioner, noe som tyder på større interne regionale forskjeller, mens andre regioner over tid har hatt gjennomgående lavere nivåer.

Basert på dataene kan regionen med de største observerte regionale forskjellene identifiseres som NUTS2-regionen DE91, som ifølge [Wikipedia: NUTS statistical regions of Germany](#) tilsvarer Braunschweig. Denne geografiske plasseringen kan imidlertid ikke leses direkte ut av figuren alene, men fremkommer først når NUTS-kodene kobles til tilhørende regioninformasjon.

## Oppgave 28

```

gini_n1 |>
  filter(nc == "DE", !is.na(gini_n1)) |>
  mutate(time = as.integer(time)) |>
  ggplot(aes(
    x = time,
    y = gini_n1,
    group = n1,
    colour = n1
  )) +
  geom_line() +
  scale_x_continuous(breaks = seq(2000, 2022, by = 5)) +
  labs(
    title = "Regional (NUTS1) ulikhet i Tyskland",
    x = "Year",
    y = "Gini-koeffisient",

```

```

colour = "n1"
) +
theme_minimal() +
theme(
  legend.position = "right"
)

```

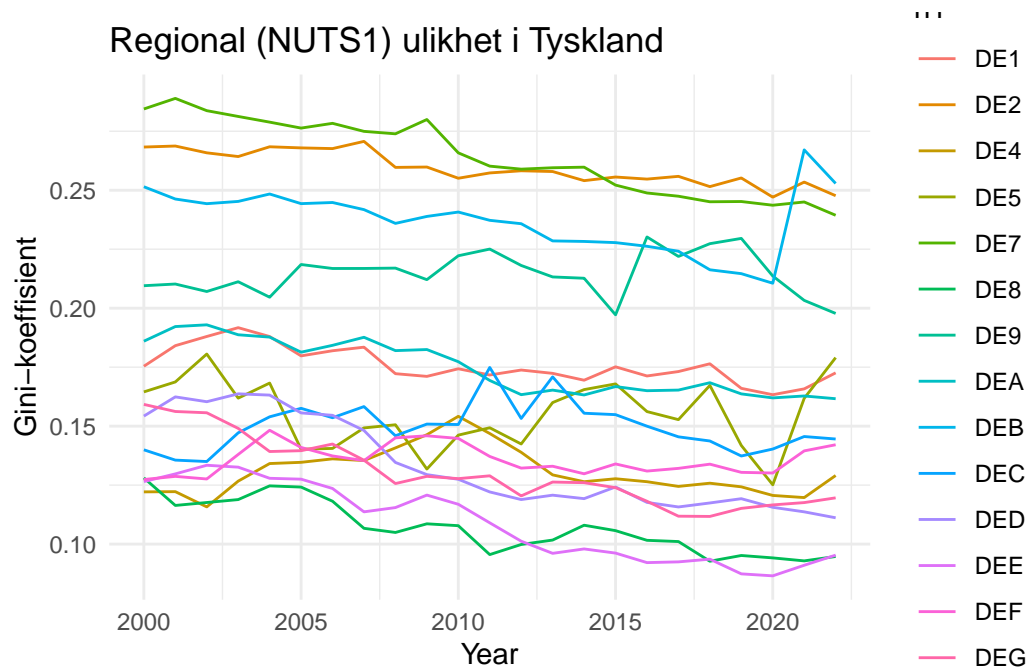


Figure 9: Utviklingen i Gini-koeffisienten for NUTS1-regionene i Tyskland.

```

eu_data_nested |>
  unnest(NUTS1_data) |>
  filter(nc_name == "Tyskland") |>
  filter(time == "2022") |>
  select(n1, gini_n1, num_reg_n1) |>
  arrange(desc(gini_n1)) |>
  flextable() |>
  line_spacing(space = 0.3) |>
  colformat_double(j = 2, digits = 4)

```

n1	gini_n1	num_reg_n1
DEB	0.2529	36
DE2	0.2477	96
DE7	0.2394	26
DE9	0.1978	45
DE5	0.1790	2
DE1	0.1726	44
DEA	0.1616	53
DEC	0.1445	6
DEF	0.1421	15
DE4	0.1291	18
DEG	0.1196	22
DED	0.1111	13
DEE	0.0953	14
DE8	0.0947	8
DE3		1
DE6		1

## Frakrike

### Oppgave 29

```
gini_n1 |>
  filter(nc == "FR", !is.na(gini_n1)) |>
  mutate(time = as.integer(time)) |>
  ggplot(aes(
    x = time,
    y = gini_n1,
    group = n1,
    colour = n1
  )) +
  geom_line() +
```

```

scale_x_continuous(breaks = seq(2000, 2022, by = 5)) +
labs(
  title = "Regional (NUTS1) ulikhet i Frankrike",
  x      = "Year",
  y      = "gini_n1",
  colour = "n1"
) +
theme_minimal() +
theme(
  legend.position = "right"
)

```

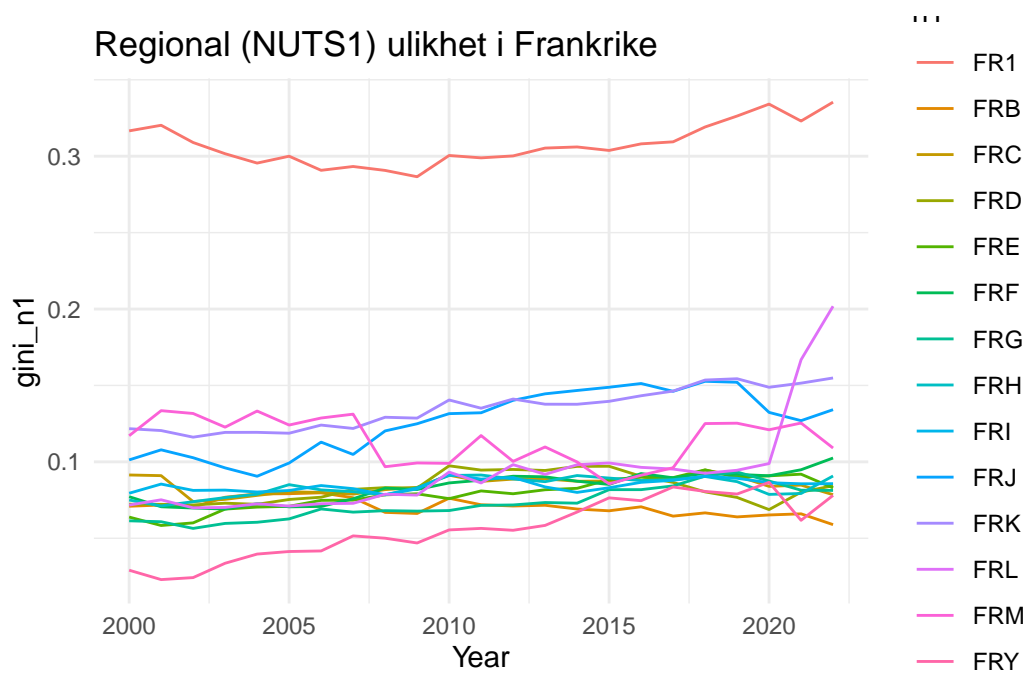


Figure 10: Utviklingen i Gini-koeffisienten for NUTS1-regionene i Frankrike.

### Oppgave 30

```

# Viser de seks NUTS1-regionene i Frankrike med høyest Gini-koeffisient i 2022.

top6_fr_n1_2022 <- gini_n1 |>
  filter(nc == "FR", time == 2022, !is.na(gini_n1)) |>

```

```

arrange(desc(gini_n1)) |>
select(n1, gini_n1) |>
slice_head(n = 6)

```

```
top6_fr_n1_2022
```

```
# A tibble: 6 x 2
```

	n1	gini_n1
	<chr>	<dbl>
1	FR1	0.335
2	FRL	0.202
3	FRK	0.155
4	FRJ	0.134
5	FRM	0.109
6	FRF	0.103

Basert på tabellen ser vi at NUTS1-sonen FR1 har suverent høyest Gini-koeffisient i 2022, med en verdi på 0,335, som er klart høyere enn de øvrige regionene. Ifølge [Wikipedia: NUTS statistical regions of France](#) tilsvarer FR1 regionen Île-de-France, som ligger i og rundt Paris-området. Dette innebærer at de største regionale forskjellene i Frankrike i 2022 er konsentrert i hovedstadsregionen.

## Oppgave 31

```

eu_data |>
  filter(nc == "FR", n1 == "FR1", !is.na(gdp_pc_n3)) |>
  mutate(time = as.integer(time)) |>
  ggplot(aes(
    x = time,
    y = gdp_pc_n3,
    group = n3,
    colour = n3
  )) +
  geom_line() +
  theme_minimal() +
  labs(
    title = "BNP per innbygger i NUTS3-regionene i Île-de-France",
    x = "År",
    y = "GDP per capita",
  )

```



```
colour = "NUTS3"
)
```

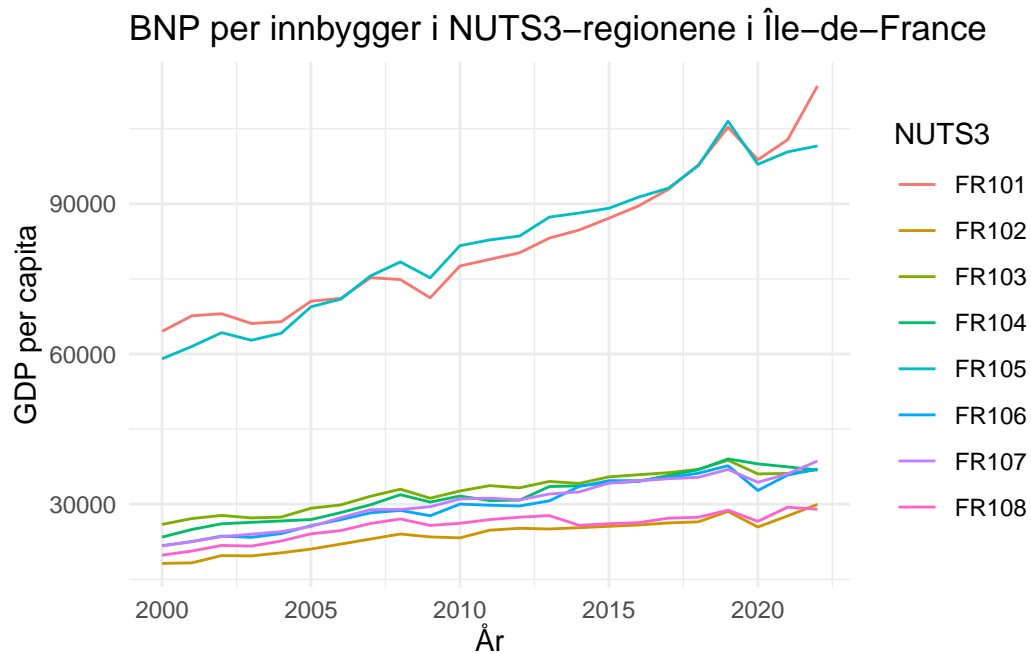


Figure 11: BNP per innbygger i NUTS3-regionene i Île-de-France.

```
# Viser BNP per innbygger i 2022 for NUTS3-regionene i FR1.
eu_data |>
  filter(nc == "FR", n1 == "FR1", time == 2022, !is.na(gdp_pc_n3)) |>
  arrange(desc(gdp_pc_n3)) |>
  select(n3, gdp_pc_n3)
```

```
# A tibble: 8 x 2
  n3      gdp_pc_n3
<chr>    <dbl>
1 FR101  113523.
2 FR105  101546.
3 FR107   38625.
4 FR106   37017.
5 FR103   36897.
6 FR104   36840.
7 FR102   29967.
8 FR108   28995.
```

## Oppgave 32

Ja. Ut fra Figure 11 kan vi se at FR1 (Île-de-France) har betydelige interne forskjeller i BNP per innbygger mellom NUTS3-regionene. I 2022 ligger Paris (FR101) og Hauts-de-Seine (FR105) på et svært høyt nivå, med BNP per innbygger på om lag 100 000–115 000, mens de øvrige NUTS3-regionene i FR1 i hovedsak ligger i intervallet rundt 29 000–39 000. Denne tydelige konsentrasjonen av svært høye verdier i noen få NUTS3-regioner, kombinert med betydelig lavere nivåer i resten av regionen, bidrar til å trekke Gini-koeffisienten for FR1 opp.

## Enkle modeller

## Oppgave 33

```
n3_data <- eu_data_nested |>
  unnest(NUTS3_data) |>
  select(nc_name, n2, n3, time, gdp_pc_n3)
```

```
n2_data <- eu_data_nested |>
  unnest(NUTS2_data) |>
  select(nc_name, n2, time, gini_n2)
```

```
NUTS2_diff <- n3_data |>
  left_join(n2_data, by = join_by(nc_name, n2, time)) |>
  mutate(
    diff_gdp_per_capita = c(NA, 100 * diff(gdp_pc_n3)),
    diff_gini_nuts2 = c(NA, 100 * diff(gini_n2))
  ) %>%
  filter(complete.cases(.)) |>
  group_by(nc_name, n2) |>
  nest(.key = "NUTS2_diff")
```

```
unnest(NUTS2_diff, NUTS2_diff) |>
  ungroup() |>
  filter(!is.nan(gini_n2)) |>
  select(n2) |>
  distinct() |>
  nrow()
```

[1] 218

### Oppgave 34

```
NUTS2_diff <- NUTS2_diff |>
  group_by(nc_name, n2) |>
  mutate(
    modell = map(
      .x = NUTS2_diff,
      .f = function(a_df) lm('diff_gini_nuts2 ~ diff_gdp_per_capita', data = a_df)
    )
  )
```

### Oppgave 35

```
NUTS2_diff <- NUTS2_diff |>
  group_by(nc_name, n2) |>
  mutate(
    mod_coeff = bind_rows(
      map(.x = modell, .f = coef)
    )
  )
```

### Oppgave 36

```
NUTS2_diff <- NUTS2_diff |>
  group_by(nc_name, n2) |>
  mutate(
    mod_sum = bind_rows(
      map(
        .x = modell,
        .f = glance
      )
    )
  )
```

## Oppgave 37

```
# Viser de tre NUTS2-regionene med høyest R2 i modellen
```

```
top3_r2 <- NUTS2_diff |>
  ungroup() |>
  tidyr::unnest(mod_sum) |>
  filter(!is.na(r.squared), !is.nan(r.squared)) |>
  arrange(desc(r.squared), nc_name, n2) |>
  select(nc_name, n2, NUTS2_diff, modell, mod_coeff, r.squared) |>
  slice(1:3)
top3_r2
```

```
# A tibble: 3 x 6
```

	nc_name	n2	NUTS2_diff	modell	mod_coeff\$`(Intercept)`	r.squared
	<chr>	<chr>	<list>	<list>	<dbl>	<dbl>
1	Polen	PL82	<tibble [92 x 6]>	<lm>	-0.0364	0.772
2	Tyskland	DED5	<tibble [69 x 6]>	<lm>	0.00344	0.701
3	Belgia	BE22	<tibble [60 x 6]>	<lm>	0.129	0.692

```
# i 1 more variable: mod_coeff$diff_gdp_per_capita <dbl>
```

```
# Viser de tre NUTS2-regionene med lavest R2 i modellen
```

```
bot3_r2 <- NUTS2_diff |>
  ungroup() |>
  tidyr::unnest(mod_sum) |>
  filter(!is.na(r.squared), !is.nan(r.squared)) |>
  arrange(r.squared, nc_name, n2) |>
  select(nc_name, n2, NUTS2_diff, modell, mod_coeff, r.squared) |>
  slice(1:3)
bot3_r2
```

```
# A tibble: 3 x 6
```

	nc_name	n2	NUTS2_diff	modell	mod_coeff\$`(Intercept)`	r.squared
	<chr>	<chr>	<list>	<list>	<dbl>	<dbl>
1	Italia	ITH3	<tibble [160 x 6]>	<lm>	0.00374	0.000102
2	Tyskland	DE26	<tibble [276 x 6]>	<lm>	-0.00903	0.000150
3	Tyskland	DE22	<tibble [276 x 6]>	<lm>	-0.0500	0.000491

```
# i 1 more variable: mod_coeff$diff_gdp_per_capita <dbl>
```

## Oppgave 38

```
# Viser de tre NUTS2-regionene med høyest koeffisient for diff_gdp_per_capita

top3_coeff <- NUTS2_diff |>
  ungroup() |>
  mutate(coeff_diff_gdp = mod_coeff$diff_gdp_per_capita) |>
  filter(!is.na(coeff_diff_gdp), !is.nan(coeff_diff_gdp)) |>
  arrange(desc(coeff_diff_gdp), nc_name, n2) |>
  select(nc_name, n2, NUTS2_diff, modell, coeff_diff_gdp) |>
  slice(1:3)

top3_coeff
```

```
# A tibble: 3 x 5
  nc_name  n2    NUTS2_diff      modell coeff_diff_gdp
  <chr>    <chr> <list>          <list>      <dbl>
1 Bulgaria BG34 <tibble [92 x 6]> <lm>         0.0000122
2 Bulgaria BG42 <tibble [115 x 6]> <lm>         0.0000111
3 Tyrkia   TRA2  <tibble [76 x 6]> <lm>         0.0000101
```

## Oppgave 39

```
# Teller hvor mange koeffisienter for diff_gdp_per_capita som er signifikante på 5%-nivå

signifikante_koeff <- NUTS2_diff |>
  ungroup() |>
  tidyr::unnest(mod_sum) |>
  filter(!is.na(p.value), !is.nan(p.value)) |>
  filter(p.value < 0.05) |>
  nrow()

signifikante_koeff
```

```
[1] 162
```

162 av de 218 estimerte koeffisientene er signifikante på 5 % nivå.

## Oppgave 40

```
# Slår sammen NUTS2-nivådata
d <- NUTS2_diff |> tidyr::unnest(NUTS2_diff)

# Beregner 99,5-persentilen av absoluttverdiene til diff_gdp_per_capita
q <- quantile(abs(d$diff_gdp_per_capita), 0.995, na.rm = TRUE)

# Definerer en skaleringsfaktor
scale_factor <- q / 1e-05

# Skalerer diff_gdp_per_capita ved å dele på skaleringsfaktoren
d <- d |> mutate(diff_gdp_scaled = diff_gdp_per_capita / scale_factor)
```

```
ggplot(d, aes(x = diff_gdp_scaled)) +
  geom_density(
    na.rm = TRUE,
    color = "black",
    linewidth = 1,
    bw = 2e-06
  ) +
  geom_vline(
    xintercept = mean(d$diff_gdp_scaled, na.rm = TRUE),
    linetype = "dashed",
    color = "grey40"
  ) +
  coord_cartesian(xlim = c(-2e-05, 1e-05)) +
  labs(
    title = "Tetthetsfordeling av diff_gdp_per_capita",
    x = "diff_gdp_per_capita",
    y = "density"
  ) +
  theme_grey()
```

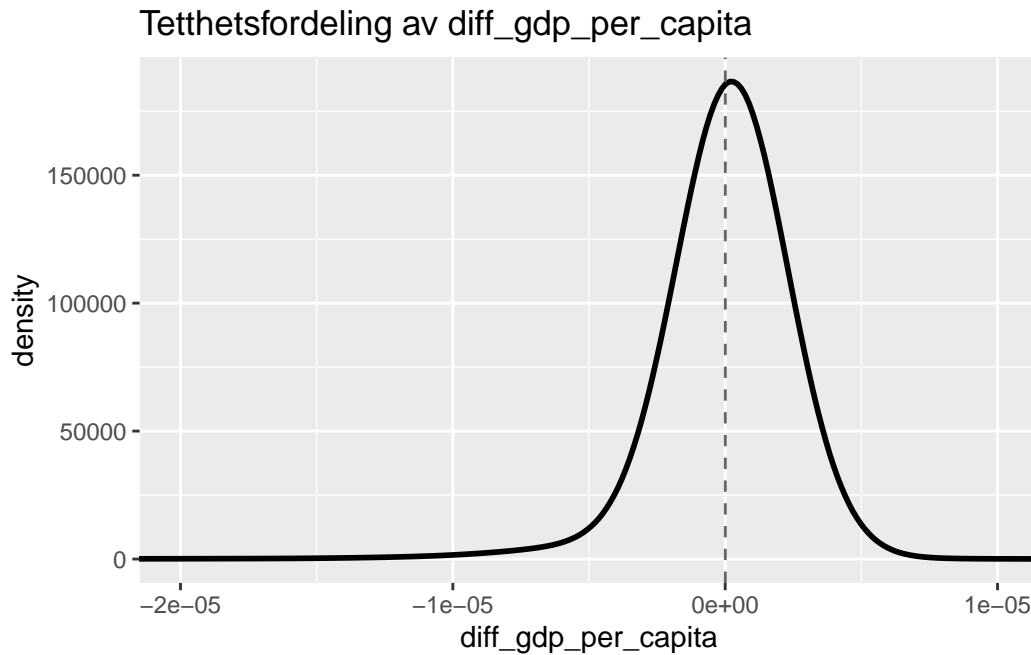


Figure 12: Tetthetsplott av diff\_gdp\_per\_capita med stiplet linje for gjennomsnittet.

## Oppgave 41

```
# Teller hvor mange regresjonskoeffisienter for diff_gdp_per_capita som er positive

positive_coeff <- NUTS2_diff |>
  ungroup() |>
  mutate(coeff_diff_gdp = mod_coeff$diff_gdp_per_capita) |>
  filter(!is.na(coeff_diff_gdp)) |>
  summarise(
    totalt = n(),
    positive = sum(coeff_diff_gdp > 0)
  )

positive_coeff
```

# A tibble: 1 x 2

	totalt	positive
	<int>	<int>
1	218	132

132 av de 218 estimerte regresjonskoeffisientene for diff\_gdp\_per\_capita er X positive.

## Oppgave 42

```
NUTS2_diff |>
  ungroup() |>
  mutate(coeff_diff_gdp = mod_coeff$diff_gdp_per_capita) |>
  filter(!is.na(coeff_diff_gdp)) |>
  summarise(
    mean_coeff = mean(coeff_diff_gdp),
    median_coeff = median(coeff_diff_gdp)
  )
```

```
# A tibble: 1 x 2
  mean_coeff median_coeff
    <dbl>         <dbl>
1 0.000000816 0.000000528
```

## Oppgave 43

```
# Utfører en ensidig t-test for å teste om gjennomsnittet av
# diff_gdp_per_capita er signifikant større enn 0

t_test_diff <- t.test(
  NUTS2_diff$mod_coeff$diff_gdp_per_capita,
  alternative = "greater",
  mu = 0
)

t_test_diff
```

One Sample t-test

```
data: NUTS2_diff$mod_coeff$diff_gdp_per_capita
t = 3.7658, df = 217, p-value = 0.0001069
alternative hypothesis: true mean is greater than 0
95 percent confidence interval:
```



```
4.583272e-07      Inf
sample estimates:
  mean of x
8.16482e-07
```

Ja, diff\_gdp\_per\_capita er signifikant større enn 0.

## Panel modell

### Oppgave 44

```
d_panel <- d %>%
  ungroup() %>%
  select(n3, time, diff_gini_nuts2, diff_gdp_per_capita) %>%
  filter(!is.na(n3), !is.na(time))

p_mod <- plm(
  diff_gini_nuts2 ~ diff_gdp_per_capita,
  data = d_panel,
  index = c("n3", "time")
)
```

### Oppgave 45

```
summary(p_mod)
```

Oneway (individual) effect Within Model

Call:

```
plm(formula = diff_gini_nuts2 ~ diff_gdp_per_capita, data = d_panel,
     index = c("n3", "time"))
```

Unbalanced Panel: n = 1186, T = 13-23, N = 26700

Residuals:

Min.	1st Qu.	Median	3rd Qu.	Max.
-37.335219	-0.559292	-0.035798	0.505712	27.300139

Coefficients:

	Estimate	Std. Error	t-value	Pr(> t )
diff_gdp_per_capita	3.9320e-07	2.4694e-08	15.923	< 2.2e-16 ***

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Total Sum of Squares: 78060

Residual Sum of Squares: 77291

R-Squared: 0.0098397

Adj. R-Squared: -0.036189

F-statistic: 253.536 on 1 and 25513 DF, p-value: < 2.22e-16

## Oppgave 46

```
summary(  
  p_mod,  
  vcov = function(x) plm::vcovHC(x, method = "white2")  
)
```

Oneway (individual) effect Within Model

Note: Coefficient variance-covariance matrix supplied: function(x) plm::vcovHC(x, method = "white2")

Call:

```
plm(formula = diff_gini_nuts2 ~ diff_gdp_per_capita, data = d_panel,  
     index = c("n3", "time"))
```

Unbalanced Panel: n = 1186, T = 13-23, N = 26700

Residuals:

	Min.	1st Qu.	Median	3rd Qu.	Max.
	-37.335219	-0.559292	-0.035798	0.505712	27.300139

Coefficients:

	Estimate	Std. Error	t-value	Pr(> t )
diff_gdp_per_capita	3.9320e-07	2.7778e-08	14.155	< 2.2e-16 ***

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

```
Total Sum of Squares:    78060
Residual Sum of Squares: 77291
R-Squared:              0.0098397
Adj. R-Squared: -0.036189
F-statistic: 200.369 on 1 and 1185 DF, p-value: < 2.22e-16
```

Her benyttes en alternativ måte å generere `summary()` for panelmodellen ved å spesifisere en egen varians–kovariansmatrise for koeffisientene. Ved å bruke `vcovHC()` med metoden “white2” beregnes heteroskedastisitets-robuste standardfeil.

De to `summary`-ene er basert på samme panelregresjonsmodell og gir identiske koeffisientestimer, men standardfeilene og tilhørende teststatistikker avviker. I den ordinære `summary()`-en er standardfeilen  $2.4694\text{e-}08$  og  $t$ -verdien 15.923, mens den alternative `summary()`-en som benytter heteroskedastisitets-robuste standardfeil via `vcovHC()` gir en høyere standardfeil på  $2.7778\text{e-}08$  og en lavere  $t$ -verdi på 14.155. Tilsvarende er  $F$ -statistikken 253.536 (1 og 25513 frihetsgrader) i den ordinære `summary()`-en, mot 200.369 (1 og 1185 frihetsgrader) i den robuste versjonen. Forskjellene skyldes bruken av ulike varians–kovariansmatriser, mens den overordnede statistiske konklusjonen forblir uendret.