

ΠΡΟΧΩΡΗΜΕΝΑ ΘΕΜΑΤΑ  
ΤΕΧΝΟΛΟΓΙΑΣ ΚΑΙ ΕΦΑΡΜΟΓΩΝ  
ΒΑΣΕΩΝ ΔΕΔΟΜΕΝΩΝ

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ΠΡΟΓΡΑΜΜΑΤΙΣΤΙΚΗ ΕΡΓΑΣΙΑ ΓΙΑ  
ΤΟ ΑΚΑΔΗΜΑΪΚΟ ΕΤΟΣ 2021-2022

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ΟΜΑΔΑ 4456-4336

ΣΩΤΗΡΙΟΣ ΠΑΝΑΓΙΩΤΟΥ, 4456

ΔΗΜΗΤΡΙΟΣ ΓΙΑΝΝΑΚΟΠΟΥΛΟΣ,  
4336

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ΤΕΛΙΚΗ ΑΝΑΦΟΡΑ

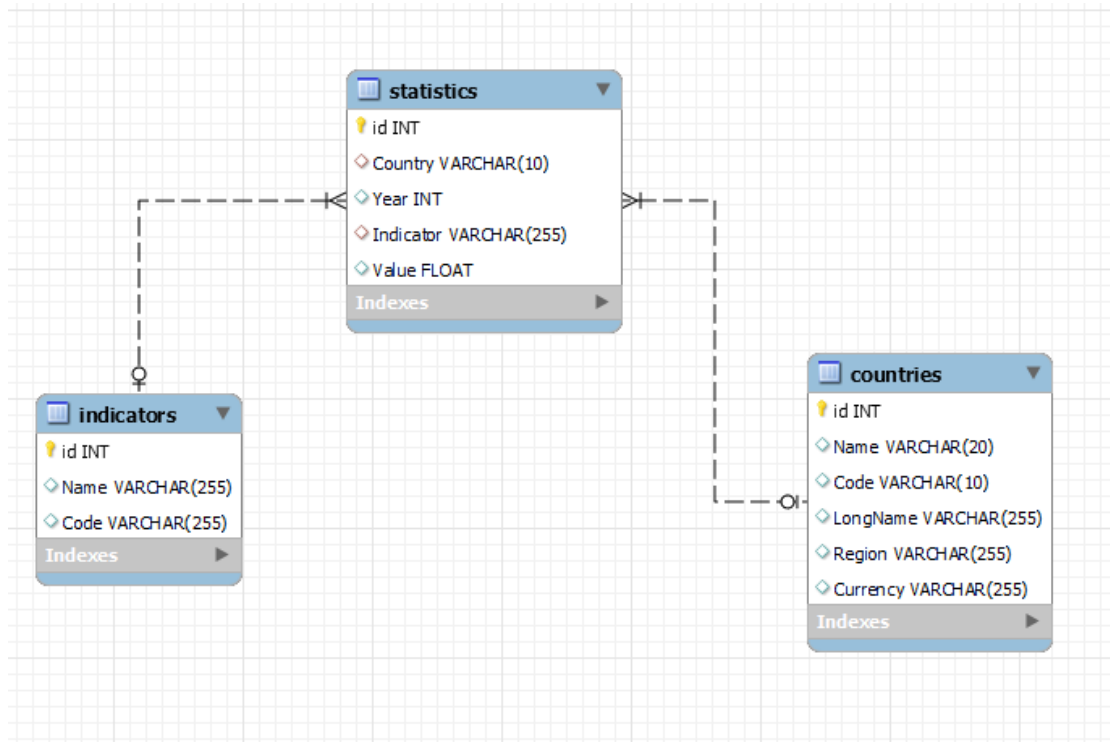
ΜΑΪΟΣ 2022

## ΙΣΤΟΡΙΚΟ ΠΡΟΗΓΟΥΜΕΝΩΝ ΕΚΔΟΣΕΩΝ

Ημερομηνία	Έκδοση	Περιγραφή	Συγγραφέας
2022/04/15	1.0	ETL+DDL	Σωτήριος Παναγιώτου, Δημήτριος Γιαννακόπουλος
2022/04/24	1.1	Mostly done	Σωτήριος Παναγιώτου, Δημήτριος Γιαννακόπουλος
2022/05/23	2.0	Ready to be published	Σωτήριος Παναγιώτου, Δημήτριος Γιαννακόπουλος

# 1 ΒΑΣΗ ΔΕΔΟΜΕΝΩΝ

## 1.1 ΣΧΕΣΙΑΚΟ ΣΧΗΜΑ ΣΕ ΛΟΓΙΚΟ ΕΠΙΠΕΔΟ



Σχήμα 1.1 Σχεσιακό σχήμα της βάσης δεδομένων του συστήματος

```
CREATE TABLE Countries(  
    id INT NOT NULL AUTO_INCREMENT,  
    Name VARCHAR(20),  
    Code VARCHAR(10),  
    LongName VARCHAR(255),  
    Region VARCHAR(255),  
    Currency VARCHAR(255),  
    PRIMARY KEY (id),  
    INDEX (Code)  
);
```

```
CREATE TABLE Indicators(  
    id INT NOT NULL AUTO_INCREMENT,  
    Name VARCHAR(255),  
    Code VARCHAR(255),  
    PRIMARY KEY (id),  
    INDEX (Code)  
);
```

```
CREATE TABLE Statistics(  
  id INT NOT NULL AUTO_INCREMENT,  
  Country VARCHAR(10),  
  Year INT,  
  Indicator VARCHAR(255),  
  Value FLOAT,  
  PRIMARY KEY (id),  
  FOREIGN KEY (Country) REFERENCES Countries(Code) ON DELETE  
  CASCADE,  
  FOREIGN KEY (Indicator) REFERENCES Indicators(Code) ON DELETE  
  CASCADE  
);
```

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## 1.2 ΣΧΕΣΙΑΚΟ ΣΧΗΜΑ ΣΕ ΦΥΣΙΚΟ ΕΠΙΠΕΔΟ

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### 1.2.1 ΡΥΘΜΙΣΗ ΤΩΝ ΠΑΡΑΜΕΤΡΩΝ ΤΟΥ DBMS

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Storage engine: InnoDB

Name	Value
innodb_buffer_pool_instances	2
innodb_buffer_pool_size	4294967296
innodb_page_cleaners	2
innodb_page_size	16384
innodb_sort_buffer_size	1048576

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### 1.2.2 ΡΥΘΜΙΣΗ ΤΟΥ ΦΥΣΙΚΟΥ ΣΧΗΜΑΤΟΣ ΤΗΣ ΒΑΣΗΣ ΔΕΔΟΜΕΝΩΝ

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Έγινε χρήση 2 lookup tables (countries, indicators) των οποίων τα fields χρησιμοποιούνται στο statistics table.

Δεν έχουν οριστεί όψεις.

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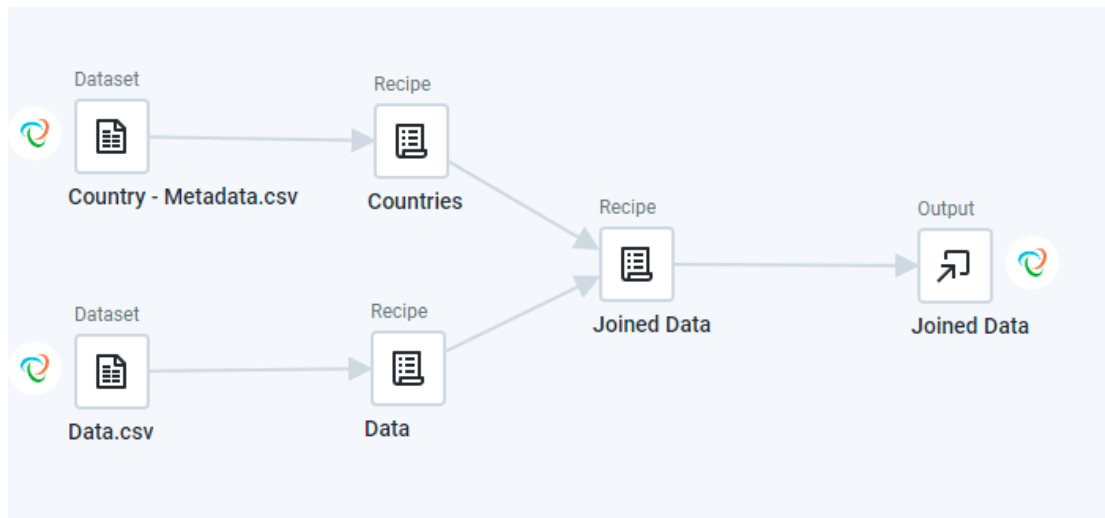
### 1.2.3 ΡΥΘΜΙΣΗ ΑΣΦΑΛΕΙΑΣ

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Το web app δεν είναι exploitable καθώς δε φαίνονται οι παράμετροι των ερωτημάτων στο url. Permissions στη βάση έχουν μόνο οι admins, οι οποία προστατεύεται από μυστικό κωδικό.

## 2 ΑΡΧΙΤΕΚΤΟΝΙΚΗ ΛΟΓΙΣΜΙΚΟΥ

### 2.1 ΑΡΧΙΤΕΚΤΟΝΙΚΗ ΚΑΙ ΔΟΜΗ ETL



Σχήμα 2.1 Παράδειγμα τεκμηρίωσης των μετασχηματισμών ETL με ένα UML component diagram

Η διαδικασία του ETL έγινε μέσω του [trifacta.com](https://trifacta.com)

Ανάλυση των recipes:

-Countries:

```
1 Delete columns other than 4 columns
```

(keep only Code, Long Name, Region,

Currency Unit)

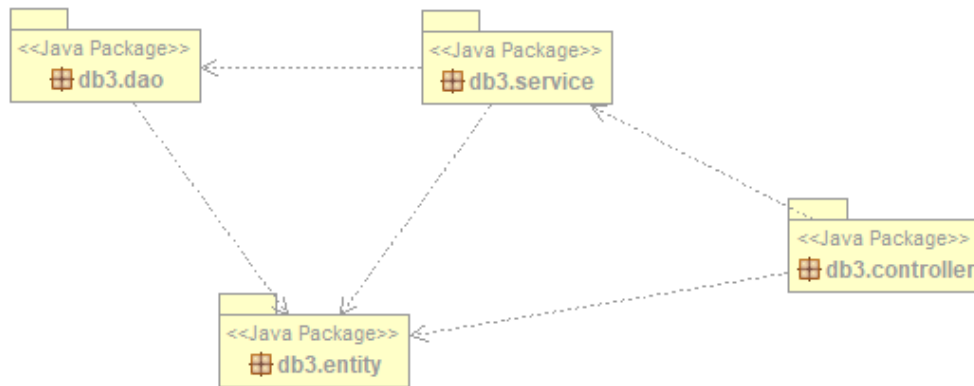
-Data:

- ```
1 Rename 1960 [YR1960] through 2020 [YR2020] by
   keeping 4 characters from the beginning (left)
2 Replace matches of `.` from 1960 through 2020
   with "
```

-Joined Data:

- ```
1 Inner join with Countries on {Country Code} ==
   Code
```

## 2.2 ΔΙΑΓΡΑΜΜΑΤΑ ΠΑΚΕΤΩΝ / ΥΠΟΣΥΣΤΗΜΑΤΩΝ ΚΕΝΤΡΙΚΗΣ ΕΦΑΡΜΟΓΗΣ



Σχήμα 2.2 Deployment diagram of a system

## 2.3 ΔΙΑΓΡΑΜΜΑ(ΤΑ) ΚΛΑΣΕΩΝ ΚΕΝΤΡΙΚΗΣ ΕΦΑΡΜΟΓΗΣ



### 3 ΥΠΟΔΕΙΓΜΑΤΑ ΕΡΩΤΗΣΕΩΝ ΚΑΙ ΑΠΑΝΤΗΣΕΩΝ



DataGraph GitHub

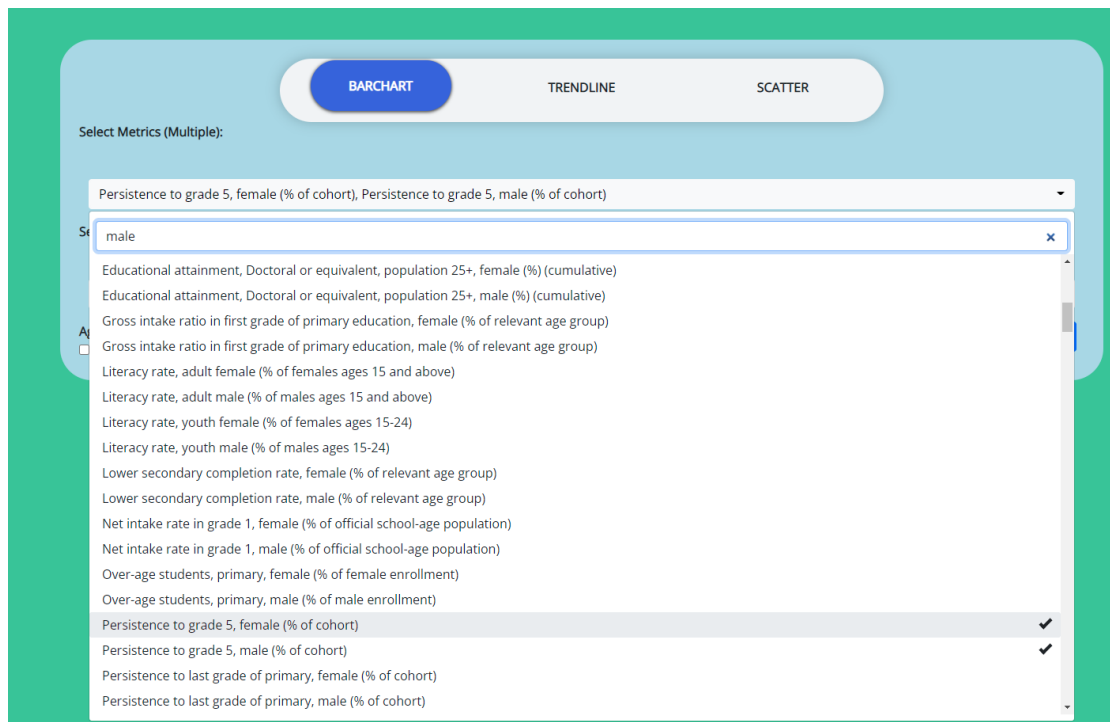
BARCHART TRENDLINE SCATTER

Select Metrics (Multiple):  
Nothing selected

Select Country (Multiple):  
Nothing selected

Aggregate by (Optional):  
☐ 5 Years ☐ 10 Years ☐ 20 Years

Submit



BARCHART TRENDLINE SCATTER

Select Metrics (Multiple):

Persistence to grade 5, female (% of cohort), Persistence to grade 5, male (% of cohort)

male

- Educational attainment, Doctoral or equivalent, population 25+, female (%) (cumulative)
- Educational attainment, Doctoral or equivalent, population 25+, male (%) (cumulative)
- Gross intake ratio in first grade of primary education, female (% of relevant age group)
- Gross intake ratio in first grade of primary education, male (% of relevant age group)
- Literacy rate, adult female (% of females ages 15 and above)
- Literacy rate, adult male (% of males ages 15 and above)
- Literacy rate, youth female (% of females ages 15-24)
- Literacy rate, youth male (% of males ages 15-24)
- Lower secondary completion rate, female (% of relevant age group)
- Lower secondary completion rate, male (% of relevant age group)
- Net intake rate in grade 1, female (% of official school-age population)
- Net intake rate in grade 1, male (% of official school-age population)
- Over-age students, primary, female (% of female enrollment)
- Over-age students, primary, male (% of male enrollment)
- Persistence to grade 5, female (% of cohort) ✓
- Persistence to grade 5, male (% of cohort) ✓
- Persistence to last grade of primary, female (% of cohort)
- Persistence to last grade of primary, male (% of cohort)



BARCHARTTRENDLINESCATTER

Select Metrics (Multiple):  
Persistence to grade 5, female (% of cohort), Persistence to grade 5, male (% of cohort)

Select Country (Multiple):  
Cyprus, Germany, Greece

Aggregate by (Optional):  
☒ 5 Years ☐ 10 Years ☐ 20 Years

Albania  
Austria  
Belgium  
Bulgaria  
Denmark  
Cyprus  
Finland  
France  
Germany  
Greece  
Hungary  
Italy  
Latvia

BARCHARTTRENDLINESCATTER

Select Metrics (Multiple):  
Persistence to grade 5, female (% of cohort), Persistence to grade 5, male (% of cohort)

Select Country (Multiple):  
Cyprus, Germany, Greece

Aggregate by (Optional):  
☒ 5 Years ☐ 10 Years ☐ 20 Years

Submit

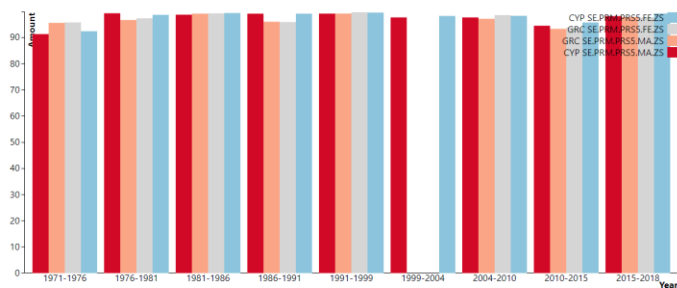
## Selected Items:

Countries:  
Cyprus, Germany, Greece

Metrics:  
Persistence to grade 5, female (% of cohort)  
Persistence to grade 5, male (% of cohort)

## Bar Chart

Nothing selected  
Submit Clean selections

[Back](#)

BARCHARTTRENDLINE

SCATTER

Select Metrics (Multiple):

Life expectancy at birth, male (years), Life expectancy at birth, total (years)

Select Country (Multiple):

Albania, Austria, Greece, Italy, Latvia

Aggregate by (Optional):

☐ 5 Years☐ 10 Years☐ 20 Years

Submit

## Selected Items:

## Countries:

Albania, Austria, Greece, Italy, Latvia

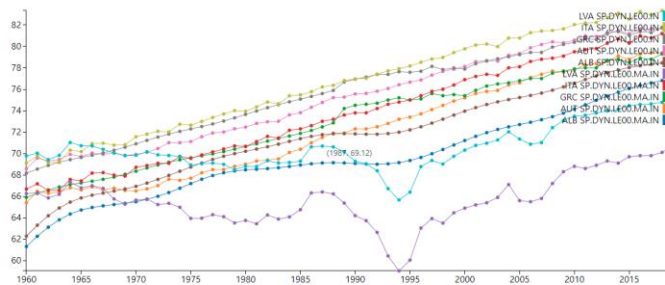
## Metrics:

Life expectancy at birth, male (years)  
Life expectancy at birth, total (years)

## Timeline/Trendline

Nothing selected

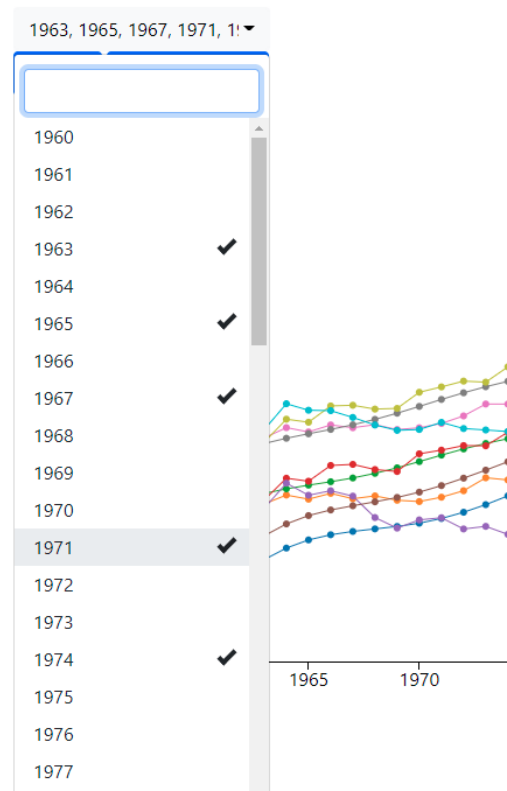
SubmitClean selections

[Back](#)

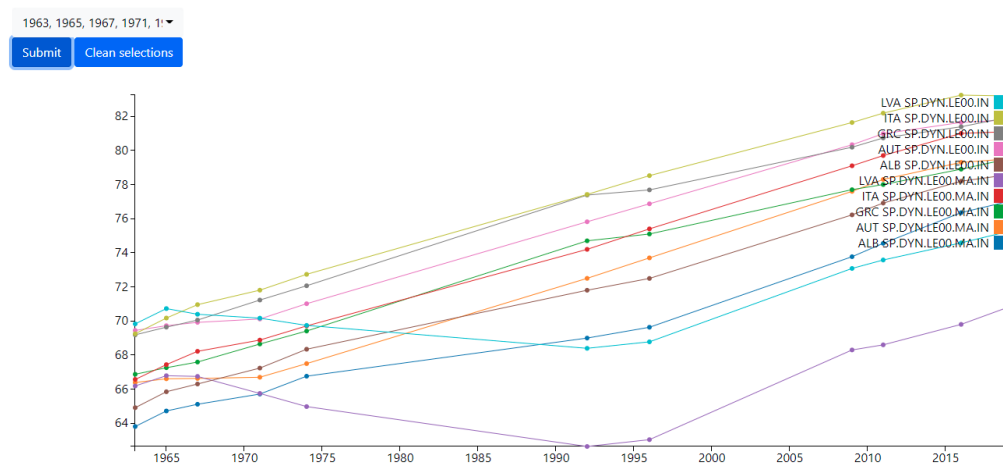
tries:

ustria, Greece, Italy, Latvia

## Timeline/Trendline



## Timeline/Trendline



BARChartTRENDLINE

SCATTER

Select Metrics (Multiple):

Life expectancy at birth, female (years), Life expectancy at birth, male (years)

Select Country (Multiple):

Albania, Denmark, France, Hungary, Netherlands, Norway, Slovenia

Aggregate by (Optional):

☐ 5 Years☐ 10 Years☐ 20 Years

Submit

## Selected Items:

Countries:

Albania, Denmark, France, Hungary, Netherlands, Norway, Slovenia

Metrics:

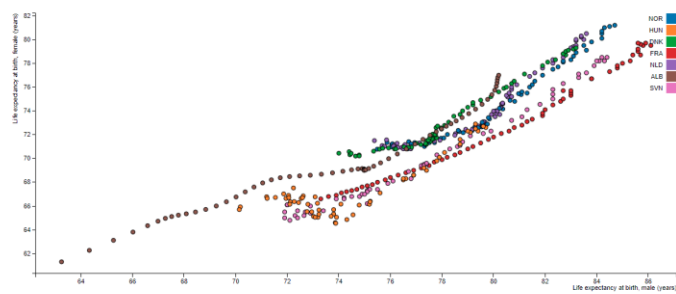
Life expectancy at birth, female (years)  
Life expectancy at birth, male (years)

## Scatter Plot

Nothing selected

Submit

Clean selections

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## 4 ΛΟΙΠΑ ΣΧΟΛΙΑ