Main program module of the research

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Contents

1 Main purpose of the program and its description

The goal of the main module is to view data from the indicators in a convenient way. When a user runs the program he can choose from two running options: the first one is to plot a graph, and the second one is to get data for a particular year.

When he enters to plot the graph option he sees all the available indicators to choose from, the program will ask to type the indicator name. After that the graph plot will appear, from it the user can easily see the correlations.

When he enters to get data for a particular year he sees all the available indicators to choose from. Then program asks three questions. The first one is to choose an indicator, more specifically its name (all the names of all indicators were shown before in the beginning, when the program started). The second question asks to choose a year. The user can decide between the year in the range from 1990 to 2017 (some indicators may not have data for each year). The last question allows one to choose the country, namely the ISO code of a country: 'PL' or 'UA'. After all the inputs the user will see the numeric data from the chosen indicator.

2 Input and output data

2.1 Input

There are four inputs. The first input that asks for running option of the program and other three inputs: an indicator, a year and a country.

1. **Running option**:
   - type 1 if you want to plot a graph for an indicator;
   - type 2 if you want to get data for a particular year.
2. **the indicator**:
   - gdp
   - gdp_per_capita
   - gross_savings
   - inflation_gdp
   - imports
   - inflation_consumer_prices
   - gni
   - total_population
   - life_expectancy
   - high_tech_exports
   - science_tech_articles
3. **the year**:
   - 1990
   - 1991
   - 1992

- 1993
- 1994
- 1995
- 1996
- 1997
- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017

4. **the country**:
   - UA
   - PL

If the user input is wrong, for example some typo or the year out of the range, the program will tell that it is wrong and will stop executing.

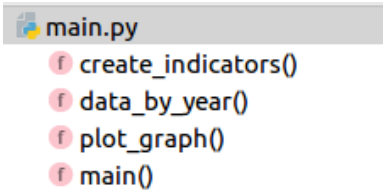
2.2 Output

The **output** of the program is simple:

- the numeric data - the indicator data for the given year of the given country;
- a graph - a graph with all indicator data represented with two functions (two countries).
- a message that the data is not available - because not all indicators have data for every year;
- an error message - if the input is wrong.

3 Structure of the module

Figure 1: The structure of the program.



3.1 Imports

The program imports **adt_class** which consists of *ADT class* and wbpy api for the **World Bank**.

3.2 Variable(s)

There are two global variables (from the **adt_class**):

- api - the **Indicator API** instance.
- iso_country_codes - the iso country codes: **'UA'** and **'PL'** in this research.

3.3 Function(s)

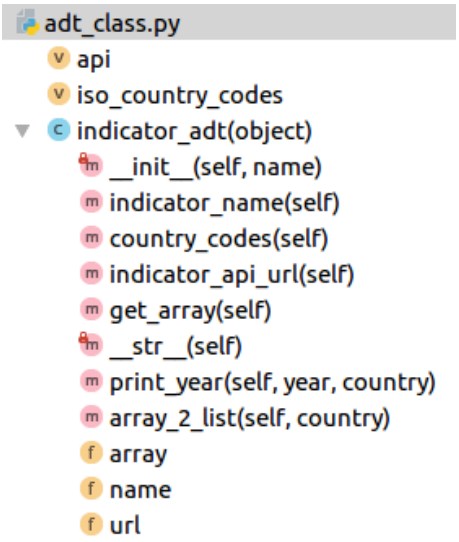
There are four functions in the program.

1. create_indicators() - creates the classes for all the eleven indicators.
2. data_by_year - calls to run the first variant of the program to show data by the given year.
3. plot_graph - calls to run the first variant of the program to plot the graph for the indicator.

3.4 Class(es)

There is only one class, the class for the indicator representation. The description of the class is in the **ADT.pdf** file.

Figure 2: The structure of the Indicator class.



4 Test cases

4.1 Example of using the program

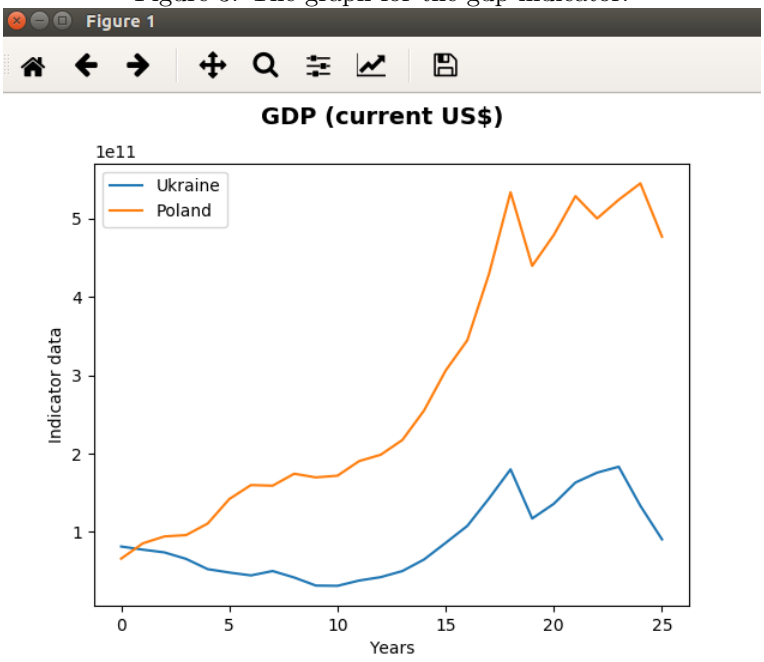
4.1.1 Plotting a graph

```
You have two options:
- type 1 if you want to plot a graph for an indicator;
- type 2 if you want to getdata for a particular year.

Please make your decision: 1
-----Available indicators-----
- gdp
- gdp_per_capita
- gross_savings
- inflation_gdp
- imports
- inflation_consumer_prices
- gni
- total_population
- life_expectancy
- high_tech_exports
- science_tech_articles

Choose the indicator: gdp
```

Figure 3: The graph for the gdp indicator.



4.1.2 Data by year

```
-----Available indicators-----
- gdp
- gdp_per_capita
- gross_savings
- inflation_gdp
- imports
- inflation_consumer_prices
- gni
- total_population
- life_expectancy
- high_tech_exports
- science_tech_articles

Choose the indicator: gdp

Choose the year (1990-2017): 1990

Enter the country (UA, PL): UA

81456918678.5008
```

***Disclaimer**: the axes label numbers are only for scale perception.*

4.2 Some other test cases

- if the user enters an indicator which does not exist he will see the following message:

```
AssertionError: Sorry, there is no such indicator.
```

- if the user enters a year which is out of the range, he will see the following message:

```
AssertionError: Year must be only in range from 1990 to 2017.
```

- if the user enters a country which is not Ukraine or Poland, he will see the following message:

```
AssertionError: Only PL or UA countries.
```