National University of Kyiv-Mohyla Academy

Information technologies

Report

Homework #2. Project structure and data

System design

Prepared

2nd year bachelor's student

group 113

Programme Applied Maths

Team #6

Team Lead Honcharenko Vladyslav

Team members:

Spitkovska Vladyslava

Tyschenko Ivan

Nych Kateryna

Zasyadko Matviy

Kyiv – 2024

Task list:

1.1 Create a team (5 people).

1.2 Draw a system diagram with a short description for each module.

1.3 Short description of how to prepare data.

1.4 Create a GIT repository

1.5 Attach the screenshots of work results:

1.1 A few screens with collected data.

1.2 Screens with https://www.visualcrossing.com/weather-api APIs access confirmation.

1.3 Screens with http://alerts.com.ua/ or https://devs.alerts.in.ua/ or https://api.ukrainealarm.com/ APIs access confirmation.

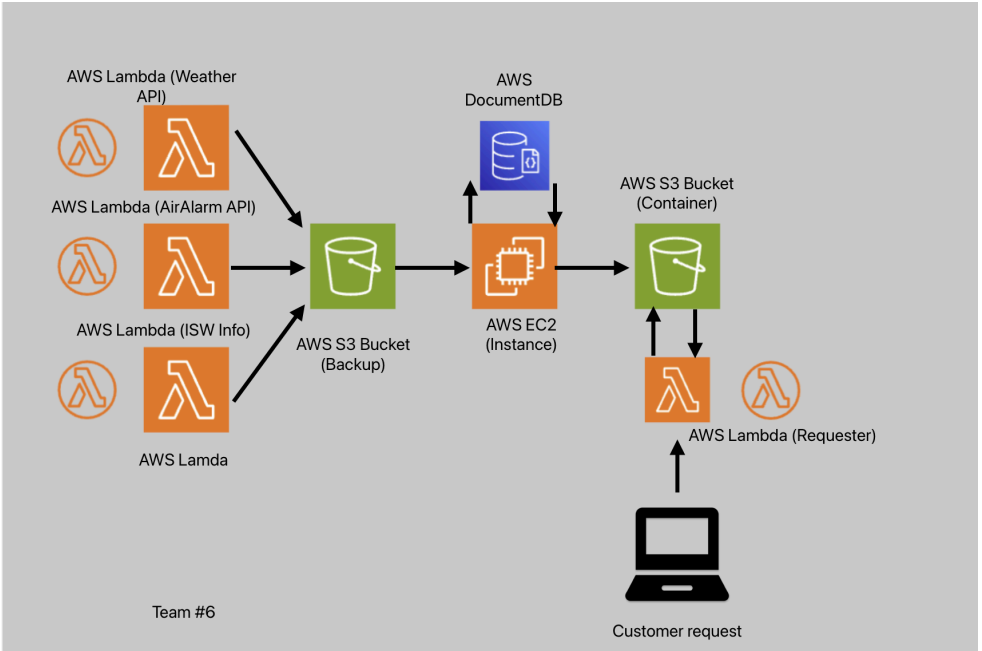
1.6 Conclusions

Create a Team

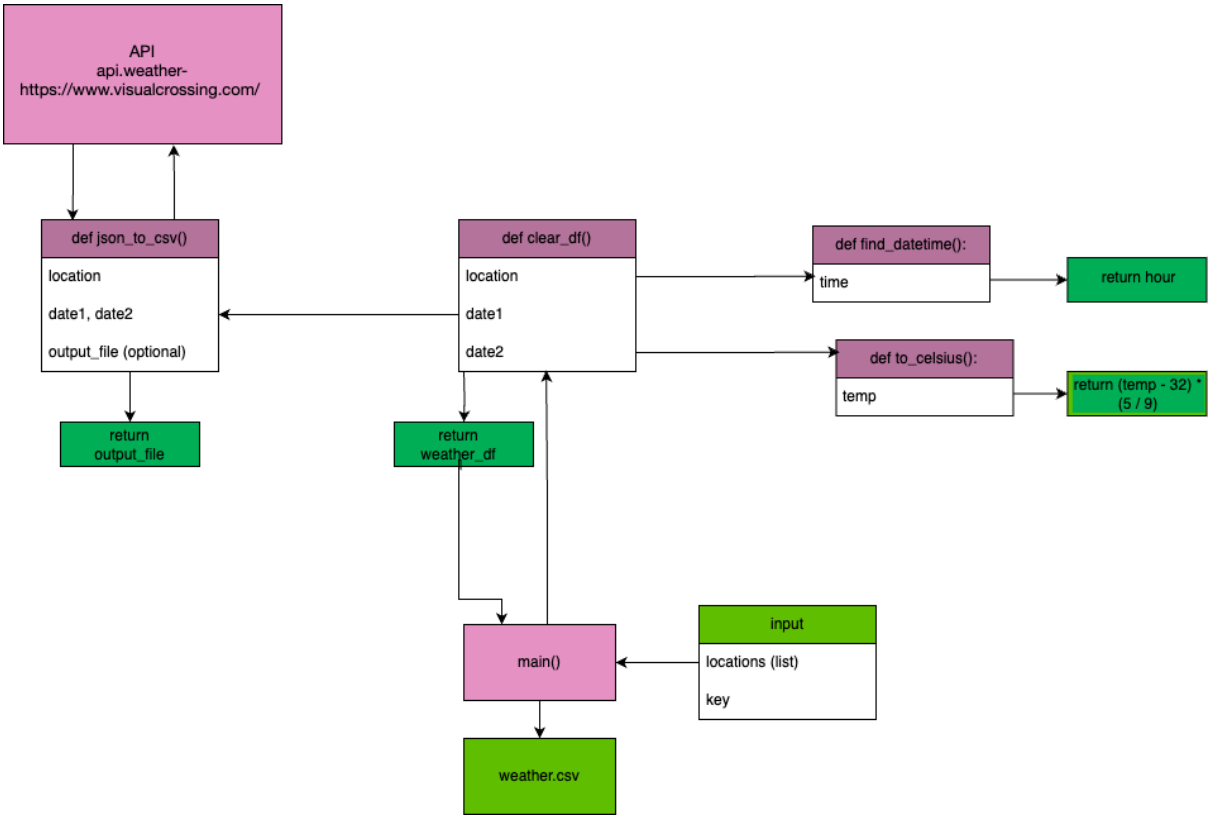
Our team #6 consists of 5 people: Team Lead Honcharenko Vladyslav, Spitkovska Vladyslava, Tyschenko Ivan, Nych Kateryna, and Zasyadko Matviy.

System diagram with a short description for each module

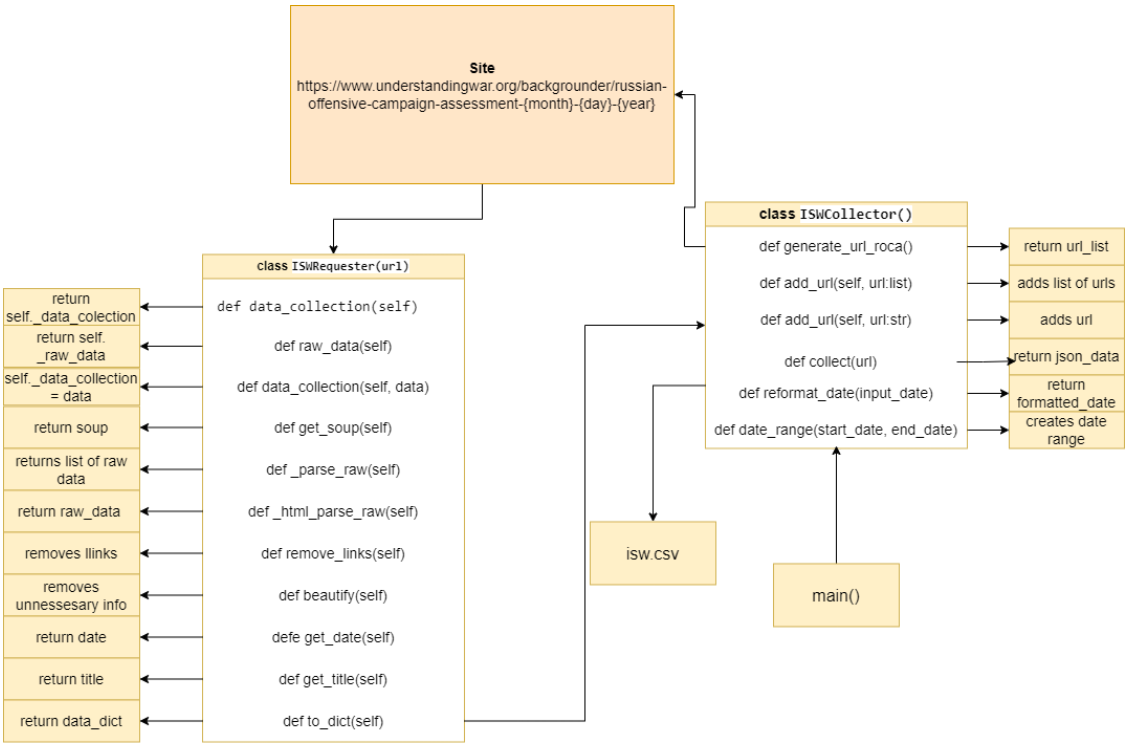
1. AWS: General System Architecture Diagram



Weather Lambda API Diagram



ISW Lambda



Short description of how to prepare data

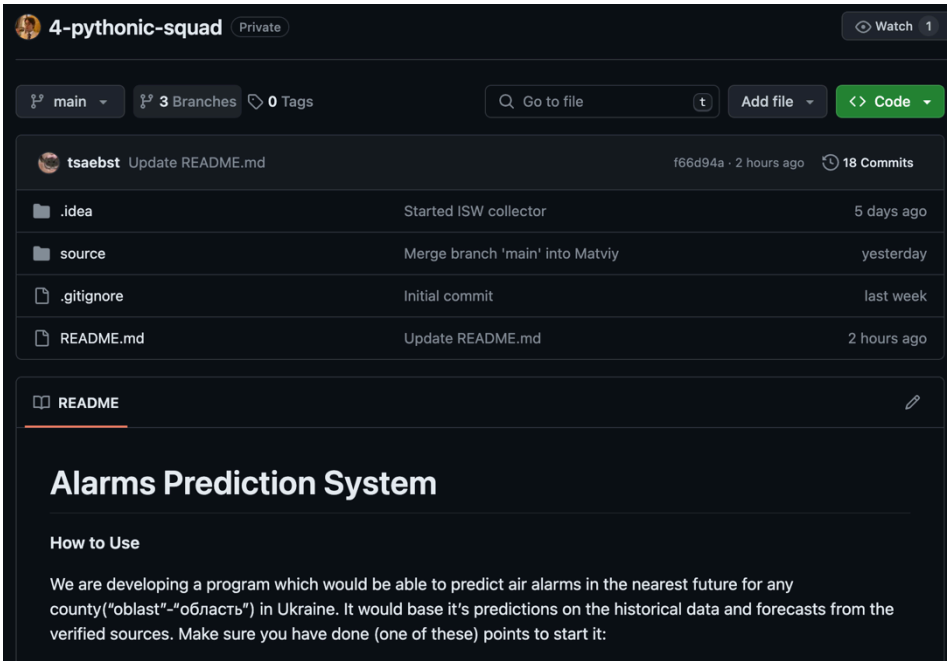
While working with Visual Crossing API, we receive JSON files with weather data. After that, we parsed it and made a CSV file with daily and hourly data and hourly frequency recording.
To clean the data in the dataset we convert it into a data frame and make some manipulations, after which we reconvert it into CSV again.

Speaking of the Air Alarms data part: We got an AIR-Alert API key. With this API key, we can get the current air alarm status using the function get_alarm(location) (arg location, type: str, is region, where we want to get alarm status). Example (1.1)* is available in the next part.

Also, we've written code to retrieve data from the Telegram channel to get information about the alarm from a region we want, to get an alarm with info, use the function get_text_report(location) (arg location, type: str, is region, where we want to get alarm status and info). Ex: (1.2)*

Final part - work with The ISW data. ISWCollecitor class will create a list of URLs. After this, we created an ISWRequester object for 1 URL to request html-data from the ISW website and clean it, by removing garbage information like links, html headers, etc. In the end, we have a dictionary with all the information we need. As a result, ISW Collector will create a collection of all URLs and data per URL.

Create a GIT repository



You can look up the code of this work after clicking on this URL (our project's GIT repo):

https://github.com/synthco/4-pythonic-squad

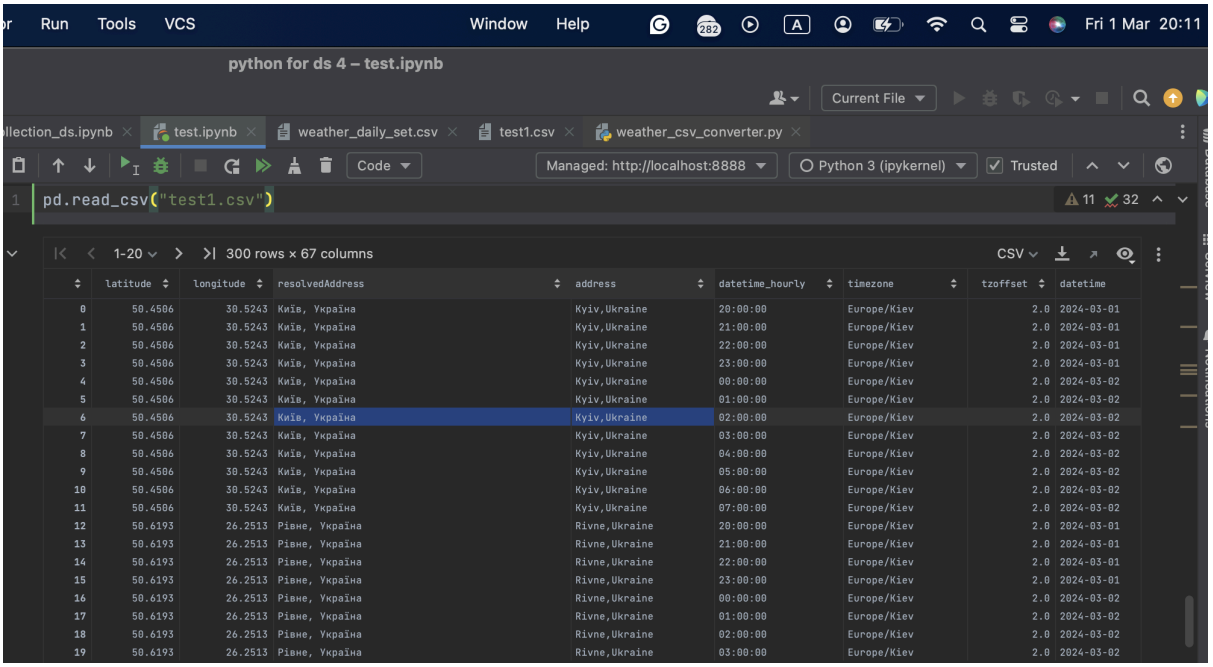
Attach the screenshots of work results:

A few screens with collected data.

Weather forecast data collection example(as a dataframe):

(You also can find more here: https://github.com/synthco/4-pythonic-squad/blob/main/source/test1.csv)

Here you can see the data frame based on test.csv:



	latitude	longitude	resolvedAddress	address	datetime_hourly	timezone	tzoffset	datetime
0	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	20:00:00	Europe/Kiev	2.0	2024-03-01
1	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	21:00:00	Europe/Kiev	2.0	2024-03-01
2	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	22:00:00	Europe/Kiev	2.0	2024-03-01
3	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	23:00:00	Europe/Kiev	2.0	2024-03-01
4	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	00:00:00	Europe/Kiev	2.0	2024-03-02
5	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	01:00:00	Europe/Kiev	2.0	2024-03-02
6	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	02:00:00	Europe/Kiev	2.0	2024-03-02
7	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	03:00:00	Europe/Kiev	2.0	2024-03-02
8	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	04:00:00	Europe/Kiev	2.0	2024-03-02
9	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	05:00:00	Europe/Kiev	2.0	2024-03-02
10	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	06:00:00	Europe/Kiev	2.0	2024-03-02
11	50.4506	30.5243	Київ, Україна	Kyiv,Ukraine	07:00:00	Europe/Kiev	2.0	2024-03-02
12	50.6193	26.2513	Рівне, Україна	Rivne,Ukraine	20:00:00	Europe/Kiev	2.0	2024-03-01
13	50.6193	26.2513	Рівне, Україна	Rivne,Ukraine	21:00:00	Europe/Kiev	2.0	2024-03-01
14	50.6193	26.2513	Рівне, Україна	Rivne,Ukraine	22:00:00	Europe/Kiev	2.0	2024-03-01
15	50.6193	26.2513	Рівне, Україна	Rivne,Ukraine	23:00:00	Europe/Kiev	2.0	2024-03-01
16	50.6193	26.2513	Рівне, Україна	Rivne,Ukraine	00:00:00	Europe/Kiev	2.0	2024-03-02
17	50.6193	26.2513	Рівне, Україна	Rivne,Ukraine	01:00:00	Europe/Kiev	2.0	2024-03-02
18	50.6193	26.2513	Рівне, Україна	Rivne,Ukraine	02:00:00	Europe/Kiev	2.0	2024-03-02
19	50.6193	26.2513	Рівне, Україна	Rivne,Ukraine	03:00:00	Europe/Kiev	2.0	2024-03-02

Air Alarms collection:

(1.1)*

```
print(get_alarm("Харківська область"))
```

```
GetAlarmDeteils
/Users/matvejzasadko/Downloads/All/Python_co
False

Process finished with exit code 0
```

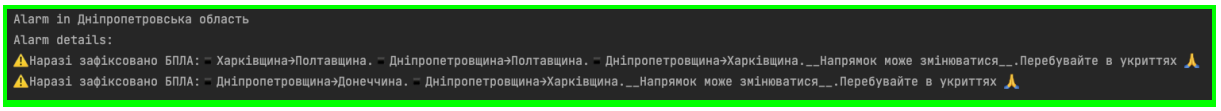
(1.2)*

Results of usage: location = “Херсонська область”

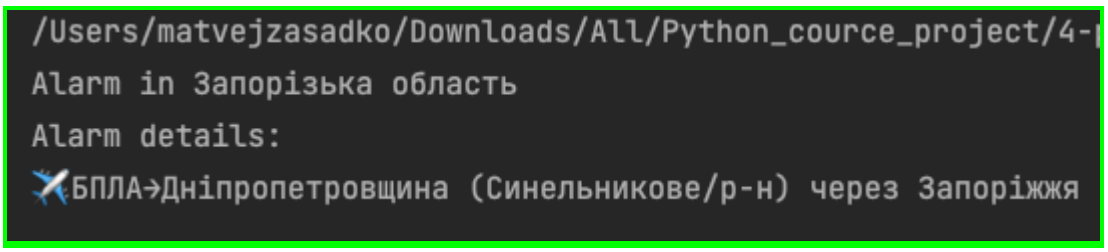
```
/Users/matvejzasadko/Downloads/All/Python_cour
Alarm in Херсонська область
Alarm details:
No alarm info in Херсонська область

Process finished with exit code 0
```

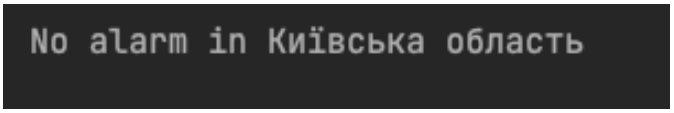
Results of usage: location = “Дніпропетровська область”



Result of usage: location = “Запорізька область”



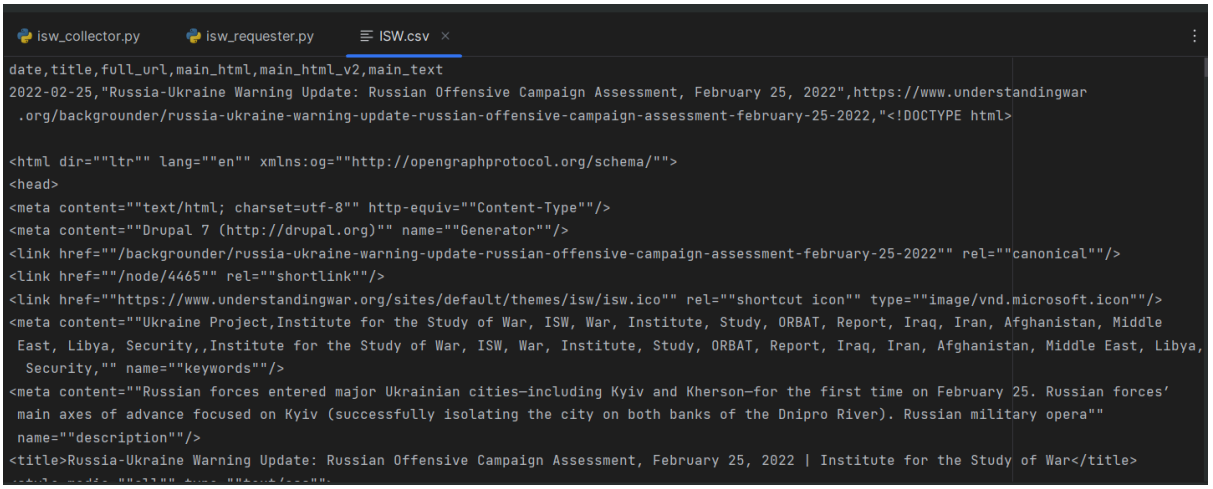
Result of usage: location = “Київська область”



ISW Historical data collection:

Few screens of ISW Historical data from 2022-02-24 to 2023-01-25

From PyCharm IDE:



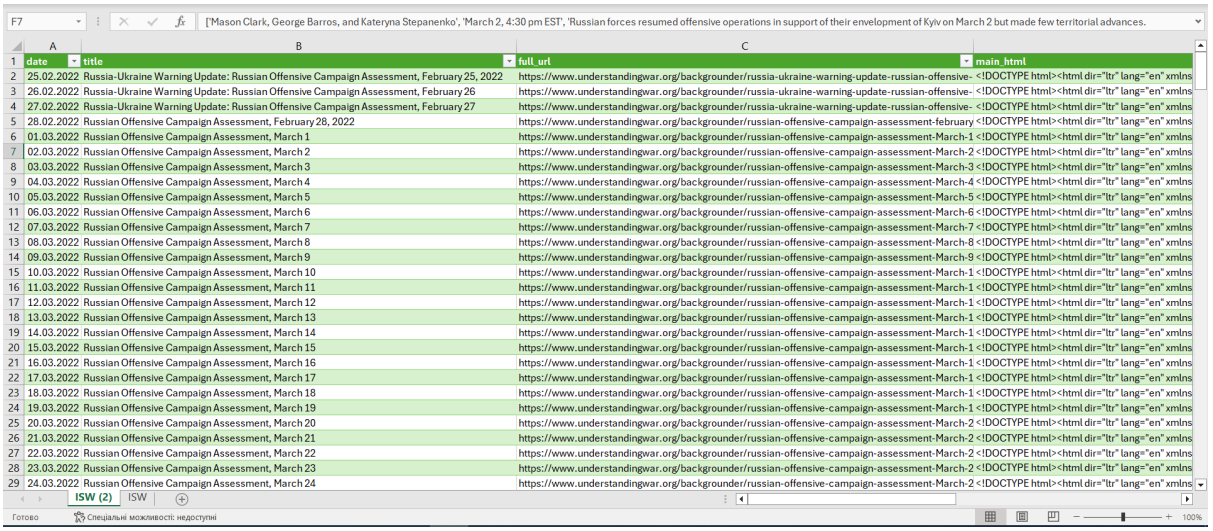
Like DataFrame:

```
           date  ...                                          main_text
0    2022-02-25  ...  ['Mason Clark, George Barros, and Kateryna Ste...
1    2022-02-26  ...  ['Mason Clark, George Barros, and Katya Stepan...
2    2022-02-27  ...  ['Mason Clark, George Barros, and Kateryna Ste...
3    2022-02-28  ...  ['Mason Clark, George Barros, and Kateryna Ste...
4    2022-03-01  ...  ['Frederick W. Kagan, George Barros, and Kater...
..          ...  ...                                              ...
316  2023-01-21  ...  ['Karolina Hird, Grace Mappes, Angela Howard, ...
317  2023-01-22  ...  ['Russian Offensive Campaign Assessment, Janua...
318  2023-01-23  ...  ['Russian Offensive Campaign Assessment, Janua...
319  2023-01-24  ...  ['Karolina Hird, Riley Bailey, Grace Mappes, G...
320  2023-01-25  ...  ['Karolina Hird, Riley Bailey, Kateryna Stepan...

[321 rows x 6 columns]

Process finished with exit code 0
```

And in the better look



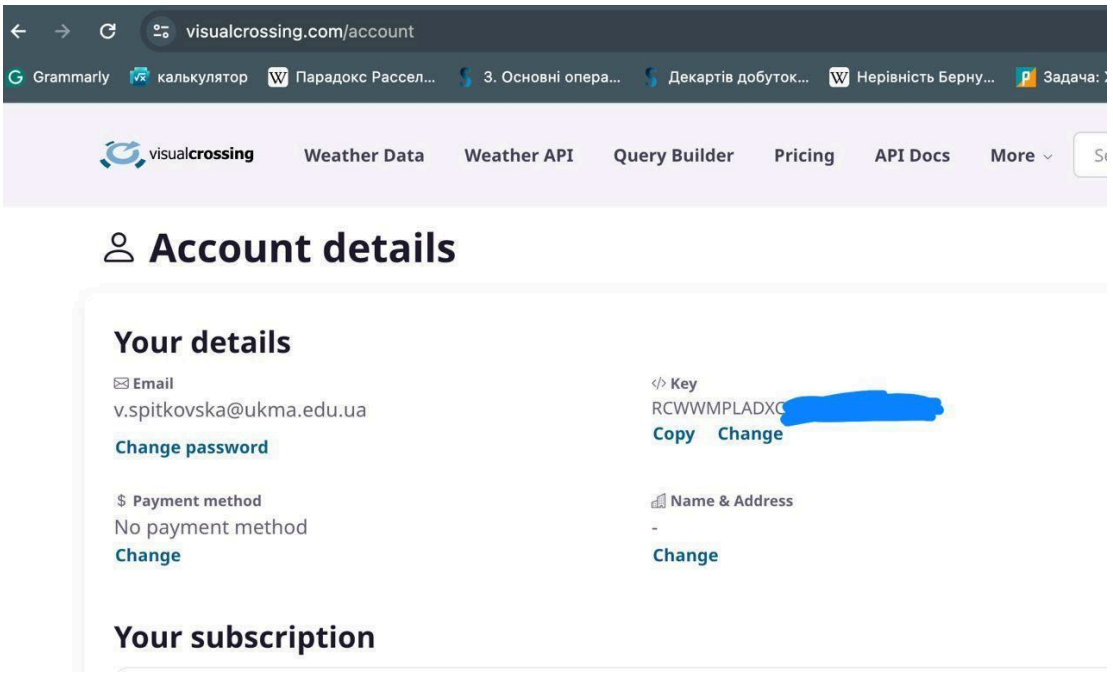
	A	B	C	D
1	date	title	full_url	main_html
2	25.02.2022	Russia-Ukraine Warning Update: Russian Offensive Campaign Assessment, February 25, 2022	https://www.understandingwar.org/backgrounder/russia-ukraine-warning-update-russian-offensive-	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
3	26.02.2022	Russia-Ukraine Warning Update: Russian Offensive Campaign Assessment, February 26	https://www.understandingwar.org/backgrounder/russia-ukraine-warning-update-russian-offensive-	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
4	27.02.2022	Russia-Ukraine Warning Update: Russian Offensive Campaign Assessment, February 27	https://www.understandingwar.org/backgrounder/russia-ukraine-warning-update-russian-offensive-	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
5	28.02.2022	Russian Offensive Campaign Assessment, February 28, 2022	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-february	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
6	01.03.2022	Russian Offensive Campaign Assessment, March 1	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-1	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
7	02.03.2022	Russian Offensive Campaign Assessment, March 2	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-2	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
8	03.03.2022	Russian Offensive Campaign Assessment, March 3	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-3	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
9	04.03.2022	Russian Offensive Campaign Assessment, March 4	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-4	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
10	05.03.2022	Russian Offensive Campaign Assessment, March 5	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-5	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
11	06.03.2022	Russian Offensive Campaign Assessment, March 6	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-6	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
12	07.03.2022	Russian Offensive Campaign Assessment, March 7	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-7	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
13	08.03.2022	Russian Offensive Campaign Assessment, March 8	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-8	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
14	09.03.2022	Russian Offensive Campaign Assessment, March 9	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-9	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
15	10.03.2022	Russian Offensive Campaign Assessment, March 10	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-1	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
16	11.03.2022	Russian Offensive Campaign Assessment, March 11	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-1	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
17	12.03.2022	Russian Offensive Campaign Assessment, March 12	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-1	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
18	13.03.2022	Russian Offensive Campaign Assessment, March 13	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-1	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
19	14.03.2022	Russian Offensive Campaign Assessment, March 14	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-1	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
20	15.03.2022	Russian Offensive Campaign Assessment, March 15	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-1	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
21	16.03.2022	Russian Offensive Campaign Assessment, March 16	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-1	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
22	17.03.2022	Russian Offensive Campaign Assessment, March 17	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-1	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
23	18.03.2022	Russian Offensive Campaign Assessment, March 18	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-1	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
24	19.03.2022	Russian Offensive Campaign Assessment, March 19	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-1	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
25	20.03.2022	Russian Offensive Campaign Assessment, March 20	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-2	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
26	21.03.2022	Russian Offensive Campaign Assessment, March 21	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-2	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
27	22.03.2022	Russian Offensive Campaign Assessment, March 22	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-2	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
28	23.03.2022	Russian Offensive Campaign Assessment, March 23	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-2	<!DOCTYPE html><html dir="ltr" lang="en" xmlns
29	24.03.2022	Russian Offensive Campaign Assessment, March 24	https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-March-2	<!DOCTYPE html><html dir="ltr" lang="en" xmlns

DataFrame from yesterday:

```
         date  ...                                          main_text
0  2024-03-02  ...  [Russian Offensive Campaign Assessment, March ...

[1 rows x 6 columns]
```

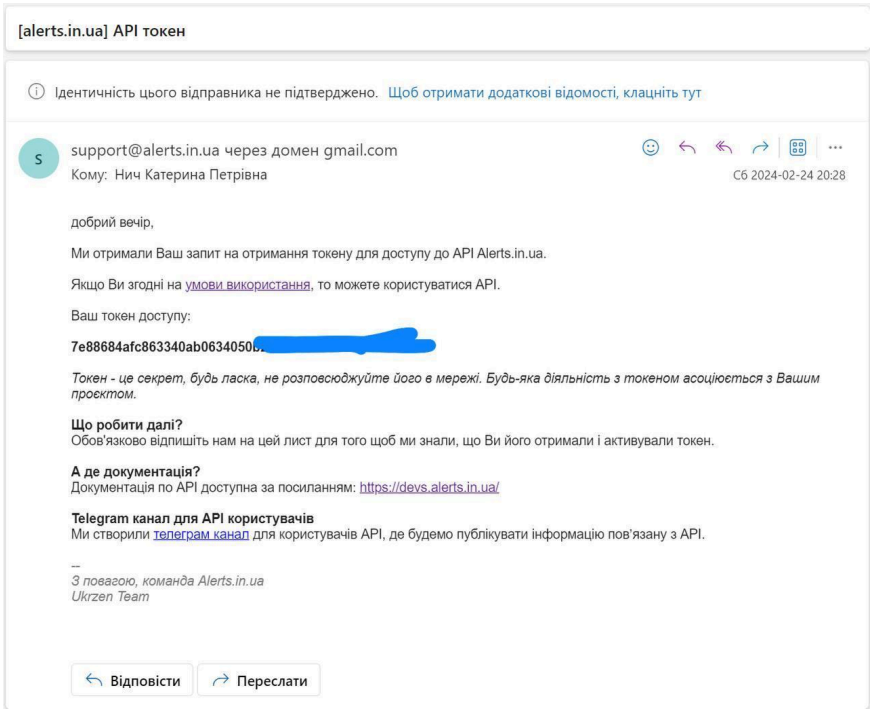
Screens with https://www.visualcrossing.com/weather-api APIs access confirmation.



Screens with http://alerts.com.ua/ or https://devs.alerts.in.ua/ or https://api.ukrainealarm.com/ APIs access confirmation.

We have applied for an API key here: https://alerts.in.ua/

And received a response:



[alerts.in.ua] API токен

Ідентичність цього відправника не підтверджено. Щоб отримати додаткові відомості, клацніть тут

support@alerts.in.ua через домен gmail.com
Кому: Нич Катерина Петрівна
Сб 2024-02-24 20:28

добрий вечір,

Ми отримали Ваш запит на отримання токену для доступу до API Alerts.in.ua.

Якщо Ви згодні на умови використання, то можете користуватися API.

Ваш токен доступу:

7e88684afc863340ab0634050[redacted]

Токен - це секрет, будь ласка, не розповсюджуйте його в мережі. Будь-яка діяльність з токеном асоціюється з Вашим проєктом.

Що робити далі?
Обов'язково відпишіть нам на цей лист для того щоб ми знали, що Ви його отримали і активували токен.

А де документація?
Документація по API доступна за посиланням: https://devs.alerts.in.ua/

Telegram канал для API користувачів
Ми створили телеграм канал для користувачів API, де будемо публікувати інформацію пов'язану з API.

--
З повагою, команда Alerts.in.ua
Ukrzen Team

Відповісти Переслати

Conclusions

In the end, we have a result represented in 2 CSVs (Weather.csv, ISW.csv) and an Air Alarm detector program.

We divided tasks among the team the next way:

Vladyslav, Ivan, and Kateryna were responsible for the ISW data collector part.

Vladyslava was responsible for the Weather data collector part and the report.

Matviy was responsible for the Air Alarms detector program.

Each of the team members also had their specific part to do in the report. During the week of work, we had regular online calls to discuss all updates of work that had been done at that point and also the planning part.

In the future, we decided to add the backend for our project (which is represented in the general Architecture System diagram) and, probably some front end.