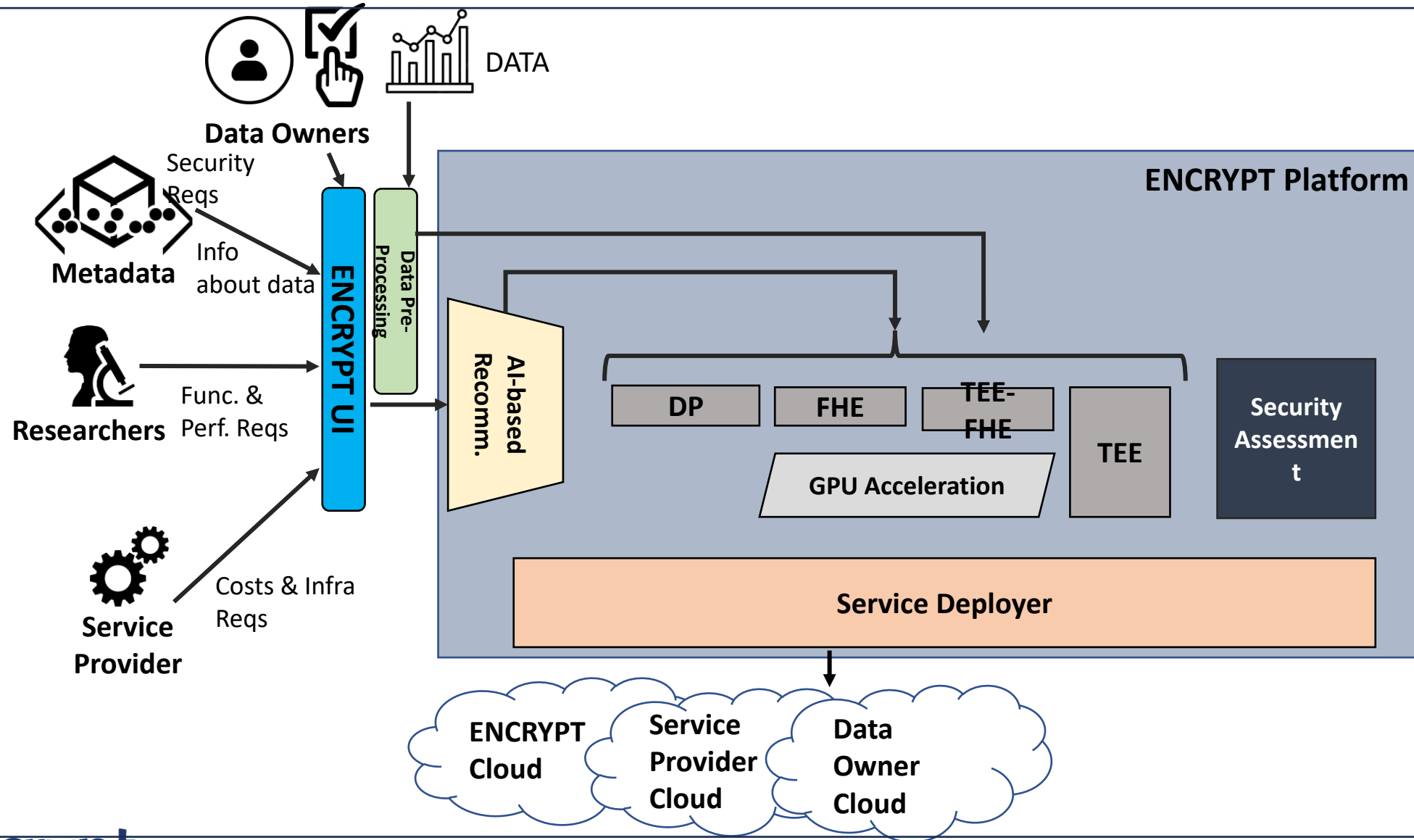


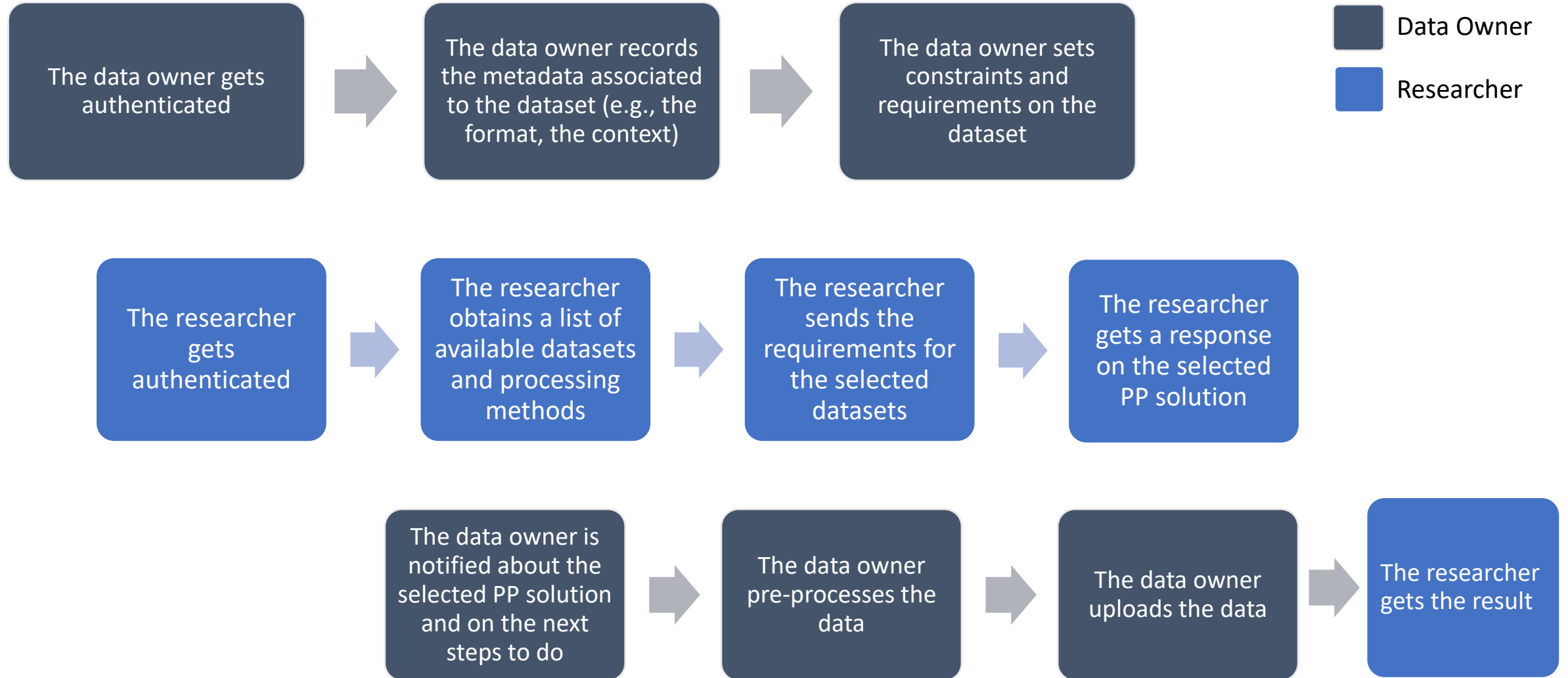
ENCRYPT - A scalable and practical privacy-preserving framework

Nima Faraji
Trust Up srl

The ENCRYPT Architecture



Information Flows (Performed Asynchronously)



Use Cases

■ Health:

- ✓ Patient data is highly sensitive and protected by strict privacy regulations. The need for secure data sharing and processing is critical for enabling medical research, clinical trials, and public health analysis.
- ✓ Analyzing patient data helps in detecting adverse drug reactions and preventing harmful interactions between medications, which is crucial for patient safety and preventing complications.

■ Fintech:

- ✓ Financial institutions gather a vast trove of data related to their customers to extract valuable information and score their creditworthiness
- ✓ Analytics made on customers' financial data could lead to an exposure of sensitive information

■ Cyber-threat Intelligence:

- ✓ Sharing and analyzing CTI data is crucial for detecting and mitigating cyberattacks.
- ✓ However, ensuring privacy is critical, as this data often involves sensitive security information that could be exploited if exposed.

Platform Demo - Overview

- **Objective:**

- ✓ In this demo, you will see the ENCRYPT platform in action, where different sets of **data owner requirements** and **researcher constraints** will be defined to realize a Health data processing.

- **What to Expect:**

- ✓ **Data Owner Requirements:**

- We'll define specific privacy and security needs for data owners, such as data sensitivity, geolocation constraints.

- ✓ **Researcher Constraints:**

- We'll set constraints related to performance, costs, and resource usage for researchers.

- **Execution Flow:**

- ✓ Based on the **dataset characteristics, the defined requirements and constraints**, the ENCRYPT platform will evaluate and suggest the most appropriate **privacy-preserving technologies and solutions**.

- **Outcome:**

- ✓ You will witness how ENCRYPT dynamically recommends suitable solutions tailored to meet specific needs, ensuring optimal secure data processing for both data owners and researchers.

Data Owner: Uploads Dataset

Dataset name *


Patient Health Profiles

Dataset description


A synthetic dataset representing anonymized patient health summaries. Each profile includes historical diagnosis codes, medication history with dosage and frequency, known allergies, and ongoing chronic diseases. This dataset is ideal for testing clinical decision support systems, electronic health record (EHR)

Dataset context

Health



PatientHealthProfiles.zip
0.02 MB



UPLOAD DATASET

Data Owner: Set Requirements on the Dataset

1

Upload dataset

2

Requirements

Data Information

Data sensitivity

1

2

3

4

5

Context

health

Computation Location

Central US

TEE support: Yes

NVIDIA GPU support: Yes

SUBMIT

Data Owner: List Datasets

My datasets

Q Search datasets...

SORT: UPLOADED (DESC)

FILTER

Longitudinal Care Records

Metadata Uploaded

ID: 672a8646060153d334ea1a83d7b81d4152871424

Size: 6.92 KB

Context: health

Uploaded: 6/16/2025(1 days ago)

This dataset simulates long-term healthcare records of patients, capturing the continuity of care across time. It includes chronological logs of diagnoses, prescriptions, allergy reports, and management plans for chronic illnesses. Useful for evaluating longitudinal data processing, patient journey mapping, and risk modeling in healthcare applications

Patient Health Profiles

Metadata Uploaded

ID: 4c2ee9b51d63e343731791c366f131bad8566775

Size: 6.87 KB

Context: health

Uploaded: 6/16/2025(1 days ago)

A synthetic dataset representing anonymized patient health summaries. Each profile includes historical diagnosis codes, medication history with dosage and frequency, known allergies, and ongoing chronic diseases. This dataset is ideal for testing clinical decision support systems, electronic health record (EHR) platforms, and data anonymization techniques.

Funded by the European Union

Views and opinions expressed are those of the ENCRYPT consortium authors only and do not necessarily reflect those of the European Union or its delegated Agency DG CNECT. Neither the European Union nor the granting authority can be held responsible for them.

This work is supported by the European Union's Horizon Europe programme under grant agreement No 101070670 (ENCRYPT).

Researcher: Select a Dataset for Computation

My computations (3)

Search computations...

SORT: UPLOADED (DESC)

FILTER

Longitudinal Care Records

No Computations +

ID: 672a8646060153d334ea1a83d7b81d4152871424

Size: 6.92 KB

Context: Health

Owner: 8c3e13c9-80aa-4148-9f80-862e18a91667

Uploaded: 6/16/2025(1 days ago)

This dataset simulates long-term healthcare records of patients, capturing the continuity of care across time. It includes chronological logs of diagnoses, prescriptions, allergy reports, and management plans for chronic illnesses. Useful for evaluating longitudinal data processing, patient journey mapping, and risk modeling in healthcare applications

Patient Health Profiles

No Computations +

ID: 4c2ee9b51d63e343731791c366f131bad8566775

Size: 6.87 KB

Context: Health

Owner: 8c3e13c9-80aa-4148-9f80-862e18a91667

Uploaded: 6/16/2025(1 days ago)

A synthetic dataset representing anonymized patient health summaries. Each profile includes historical diagnosis codes, medication history with dosage and frequency, known allergies, and ongoing chronic diseases. This dataset is ideal for testing clinical decision support systems, electronic health record (EHR) platforms, and data anonymization techniques.

Funded by the European Union

Views and opinions expressed are those of the ENCRYPT consortium authors only and do not necessarily reflect those of the European Union or its delegated Agency DG CNECT. Neither the European Union nor the granting authority can be held responsible for them.

This work is supported by the European Union's Horizon Europe programme under grant agreement No 101070670 (ENCRYPT).

Researcher: Set Computational Requirements

1 Requirements

2 Select features

Set computational requirements for:
Longitudinal Care Records

Moderate computational constraints

The user has access to computational resources that can handle a moderate level of computational complexity. However, there might be some limitations or trade-offs in terms of processing time, efficiency, or scalability. Careful resource management or optimization may be necessary to ensure the use case can be executed within the desired constraints.

Computational Intensity

1

2

3

4

5

Cost Constraints

1

2

3

4

5

Performance

1

2

3

4

5

Resource Limitation

1

2

3

4

5

Data Utility

1

2

3

4

5

Mode

Training

and do not necessarily reflect those of the European Union or its designated agency for encryption. Neither the European Union nor the granting authority can be held responsible for them.

programme under grant agreement No 101070670 (ENCRYPT).

Researcher: Select the Desired Target Field

Set computational requirements for:
Health

RESET

SUBMIT

Model Features

Patient

N_Record

Birth_date

Birth_place

More_than_55yo

Age

Sex

Model Target

ID

Data Owner: Notified about the Data Upload Procedure

ENCRYPT Platform

Computation Ready for Upload

The Virtual Machine for computation **681a4928ade5c238339db268** is now ready.

You can upload the dataset **"Health "** using the ENCRYPT Platform.

...

This message was sent from the **ENCRYPT Platform** — a scalable and practical privacy-preserving framework for secure data processing.

← Reply

→ Forward

😊

Data Owner: Start Data Preprocessing

My datasets (2)

Search datasets...

SORT: UPLOADED (DESC)

FILTER

Longitudinal Care Records

Metadata Uploaded1 request

ID: 672a8646060153d334ea1a83d7b81d4152871424

Size: 6.92 KB

Context: health

Uploaded: 6/16/2025(1 days ago)

This dataset simulates long-term healthcare records of patients, capturing the continuity of care across time. It includes chronological logs of diagnoses, prescriptions, allergy reports, and management plans for chronic illnesses. Useful for evaluating longitudinal data processing, patient journey mapping, and risk modeling in healthcare applications

Request ID	RE results	Pre-process	Upload	Status
6bd0e6c9-77c4-4053-97cd-8eeb6d94b6ff	DP			

Patient Health Profiles

Metadata Uploaded1 request

ID: 4c2ee9b51d63e343731791c366f131bad8566775

Size: 6.87 KB

Context: health

Funded by the European Union

Views and opinions expressed are those of the ENCRYPT consortium authors only and do not necessarily reflect those of the European Union or its delegated Agency DG CNECT. Neither the European Union nor the granting authority can be held responsible for them.

This work is supported by the European Union's Horizon Europe programme under grant agreement No 101070670 (ENCRYPT).

Data Owner: Get info regarding the Processing

My datasets (2)

Search datasets...

Longitudinal Care Records

ID: 672a8646060153d334ea1a83d7b81d4152871424
Size: 6.92 KB
Context: health
Uploaded: 6/16/2025(1 days ago)

This dataset simulates long-term healthcare records of path data processing, patient journey mapping, and risk modeling

Request ID

6bd0e6c9-77c4-4053-97cd-8eeb6d94b6ff

Patient Health Profiles

ID: 4c2ee9b51d63e343731791c366f131bad8566775
Size: 6.87 KB
Context: health

Views and opinions expressed are those of the ENCRYPT consortium authors only and do not necessarily reflect those of the European Union or its delegated Agency DG CNECT. Neither the European Union nor the granting authority can be held responsible for them.

This work is supported by the European Union's Horizon Europe programme under grant agreement No 101070670 (ENCRYPT).

AI Recommendation

Generated by AI based on your constraints

For your segmentation use case in the health domain, based in spaincentral, you described the following scenario: medium-low data sensitivity (2), low data size (1), medium computational intensity (3), medium-high computational constraints (4), medium-high performance constraints (4), medium time constraints (3), high cost constraints (5).

We therefore recommend you use Differential Privacy to protect your data. Differential Privacy (DP) is a technique used to maximize the accuracy of statistics calculated from the data while minimizing the chances of identifying its individual records. It adds noise to the data to protect privacy while maintaining overall accuracy.

DP is appropriate for situations with high computational constraints as the addition of noise does not affect computation time. This is in contrast to FHE, which can significantly increase the computational burden.

In DP, the key parameter that controls privacy is epsilon (ϵ). Lower values of ϵ add more noise to the data, increasing privacy but reducing accuracy. Higher values of ϵ introduce less noise, preserving the data's utility but offering weaker privacy protection.

The recommended value of epsilon for your use case is 2.7325. This value balances privacy protection and data utility, providing a reasonable level of protection without sacrificing too much accuracy.

DISMISS

Researcher: Notified about Completed Processing

ENCRYPT Platform

Computation Completed

The computation for the selected dataset with ID **672a8646060153d334ea1a83d7b81d4152871424** has been successfully completed.

Computation ID: **681a4928ade5c238339db268**

...

← Reply

→ Forward



Researcher: Select a Dataset for Computation

Hide computations

My Datasets

List Of Computations

Search computations...

SORT: UPLOADED (DESC)

FILTER

Longitudinal Care Records

1/2 Complete

2 computations

+

ID: 672a8646060153d334ea1a83d7b81d4152871424

Size: 6.92 KB

Context: Health

Owner: 8c3e13c9-80aa-4148-9f80-862e18a91667

Uploaded: 6/16/2025(1 days ago)

This dataset simulates long-term healthcare records of patients, capturing the continuity of care across time. It includes chronological logs of diagnoses, prescriptions, allergy reports, and management plans for chronic illnesses. Useful for evaluating longitudinal data processing, patient journey mapping, and risk modeling in healthcare applications

Computation ID ↑	Computation Type	Results	Download
96fd3651-4cf2-4c27-892c-c08b0ebfcedd	segmentation		
4a1e392f-1308-4b7a-8748-d54036883727	segmentation		

Download results

Longitudinal Care Records

Pending

1 computation

+

ID: 672a8646060153d334ea1a83d7b81d4152871424

Size: 6.92 KB

Context: Health

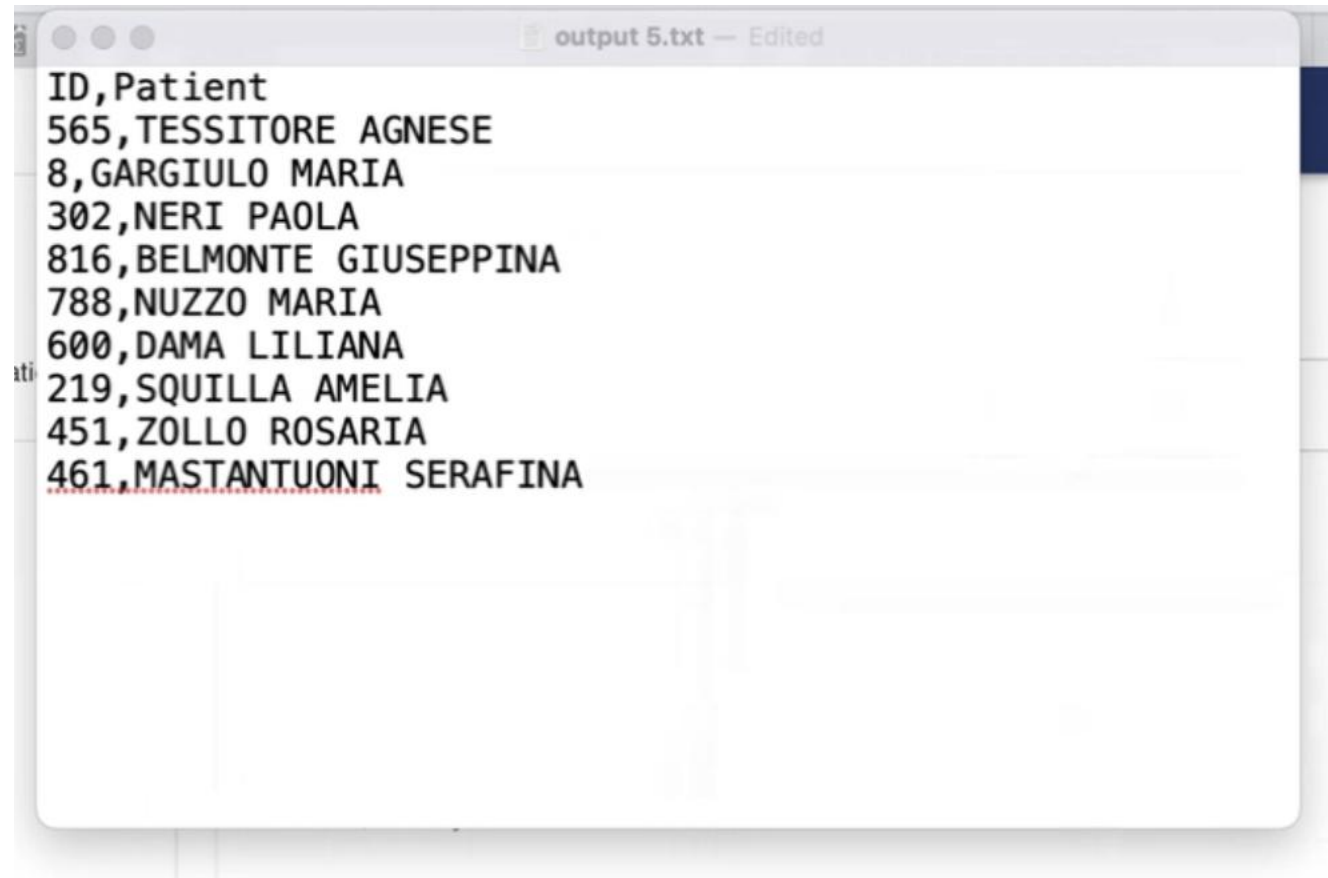
Funded by the European Union

Views and opinions expressed are those of the ENCRYPT consortium authors only and do not necessarily reflect those of the European Union or its delegated Agency DG CNECT. Neither the European Union nor the granting authority can be held responsible for them.

This work is supported by the European Union's Horizon Europe programme under grant agreement No 101070670 (ENCRYPT).

17th June 2025, Athens

Researcher: Obtain the Result



```
output 5.txt - Edited
ID, Patient
565, TESSITORE AGNESE
8, GARGIULO MARIA
302, NERI PAOLA
816, BELMONTE GIUSEPPINA
788, NUZZO MARIA
600, DAMA LILIANA
219, SQUILLA AMELIA
451, ZOLLO ROSARIA
461, MASTANTUONI SERAFINA
```



Thank you!

Stay in touch

 <https://encrypt-project.eu/>

 [encrypt-project](https://www.linkedin.com/company/encrypt-project)

 [@encrypt_project](https://twitter.com/encrypt_project)