



■ AMO PAYMENTS — USER MANUAL

■■ English Version

1. Accessing the Platform

Click on “Go to Payment Page.” Enter your Username and Password. The system will prompt you to update your password the first time you log in.

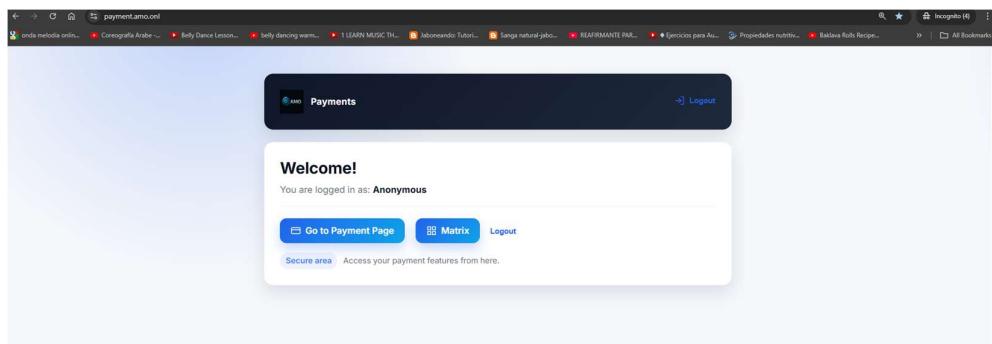


Fig.1.1 Main page <https://payment.amo.onl> before log in / user authentication

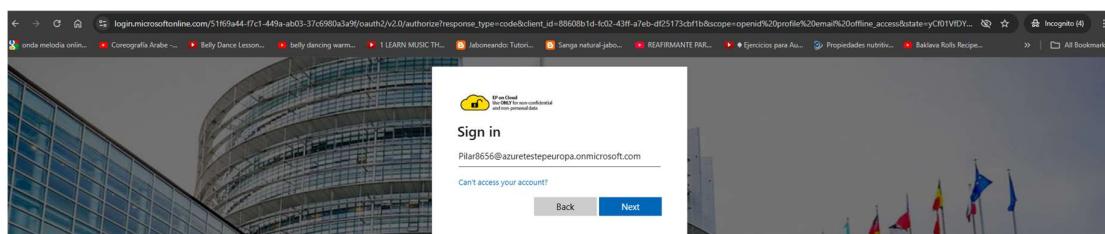


Fig.1.2 Sign in page <https://payment.amo.onl> for user authentication
<user>@azuretesteurop.eu.onmicrosoft.com

2. Setting Up Verification

After updating your password, proceed to set up your verification method (this may involve a security question, email, or two-step verification).

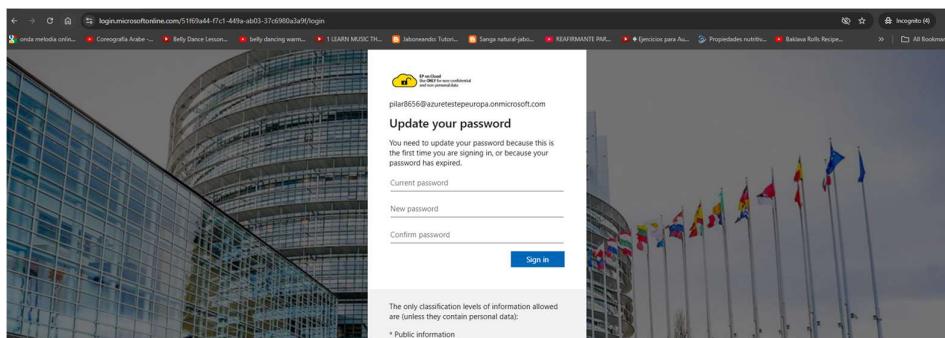


Fig.2.1 Update password during first time sign in

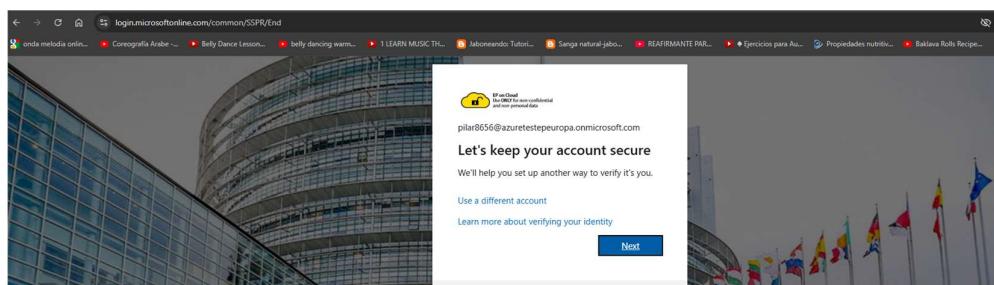


Fig.2.2 Set up strong authentication / mobile phone multifactor authentication during first time sign in

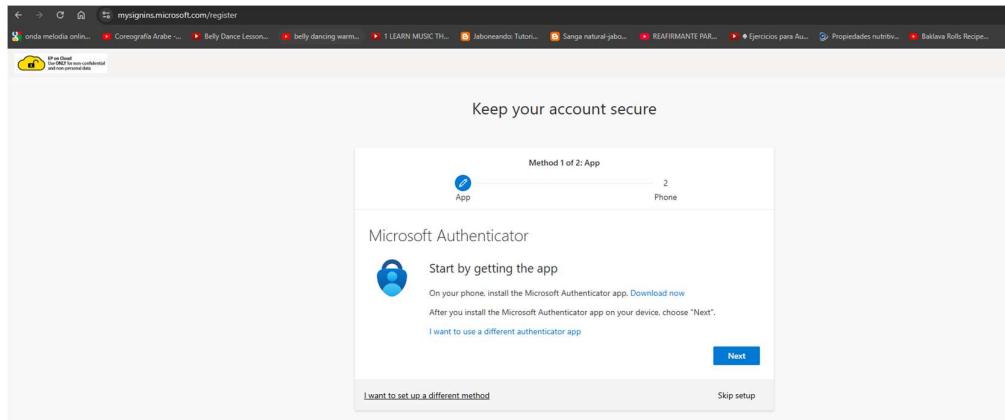


Fig.2.3 Download the app for multifactor authentication



Fig.2.4 Scan QR code to download the app for multifactor authentication

3. Payment Operations

Once verified, click again on “Go to Payment Page.” From here, you can manage your payments, transactions, and user settings.

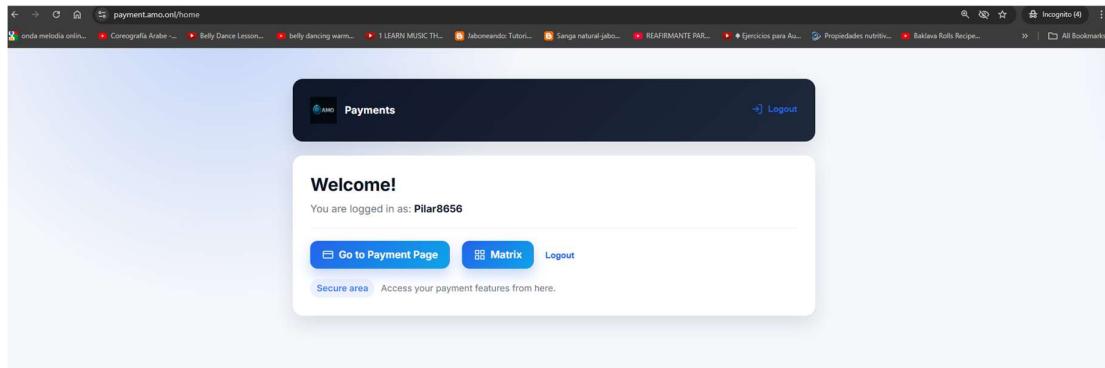


Fig.3.1 Main page <https://payment.amo.on> after successful authentication as user e.g. Pilar8656

A screenshot of a web browser showing the "Make a Payment" form. The title bar says "Payment" and the URL is "payment.amo.on/payment". The main content area has a dark header with the "AMO Payments" logo and a "Logout" button. Below this is a white box titled "Make a Payment" with the sub-instruction "Apply a payment from A to B on the matrix (server-to-server)". It contains several input fields: "Blob name *" with value "initial-matrix-20251024-080516.b64", "Container *" with value "matrices", "Node A *" with value "Pilar8656", "Node B *" with placeholder "Enter recipient node", "Amount * (integer > 0)" with value "100", and "Out base (always equals blob name)" with value "initial-matrix". At the bottom are "Submit Payment" and "Cancel" buttons.

Fig.3.2 Make a payment form: Node A is the authenticated user only and Node B is the destination user e.g. amo

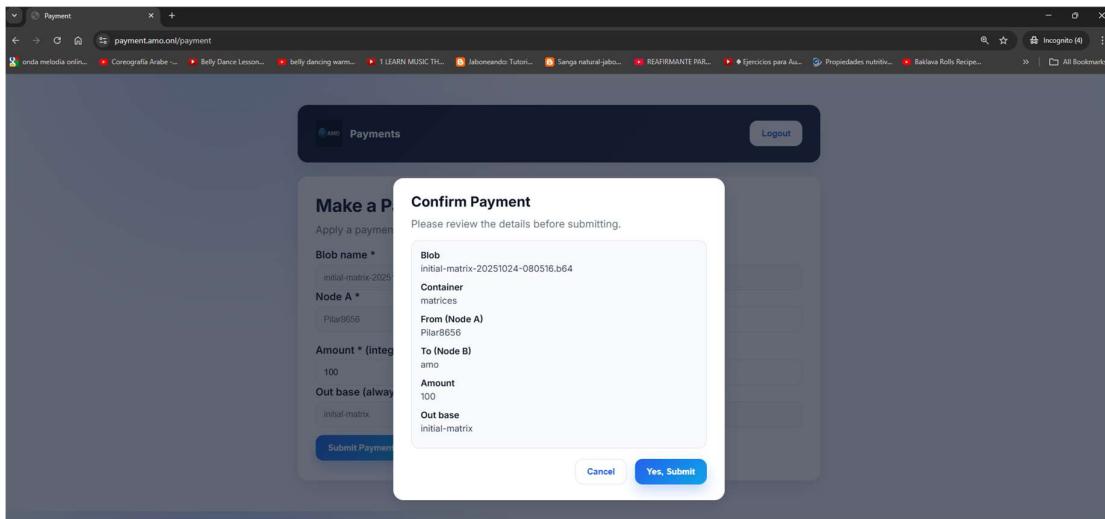


Fig.3.2 Make a payment confirmation form: Node A is the authenticated user only and Node B is the destination user e.g. amo and amount is a positive integer >0

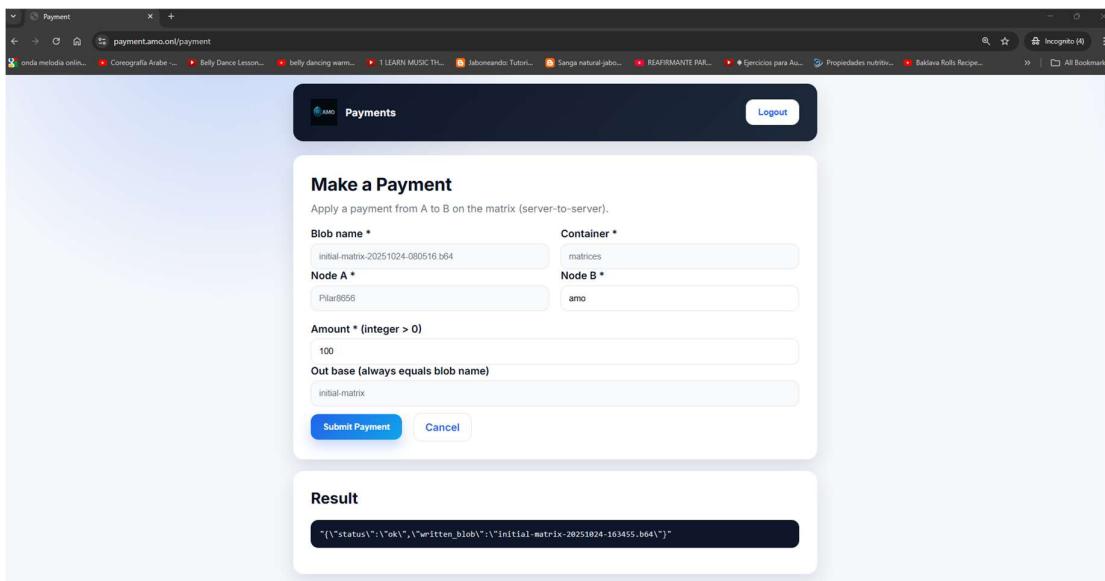


Fig.3.3 Result of the payment: Status is OK and matrix is updated with a name including a timestamp e.g. 2025-10-26 16:34:55

4. Working with the Matrix

As an alternative, you can go to the Matrix Page. Then select “Analyze Matrix.” Copy the code provided on that page and paste it into ChatGPT to analyze or visualize your data.

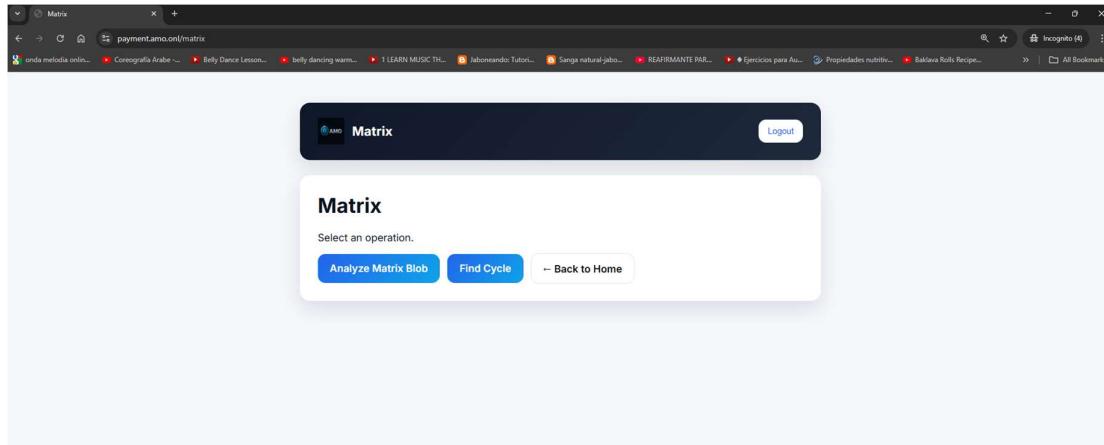


Fig.4.1 Matrix functions such as Analyse Matrix or Find a Cycle.

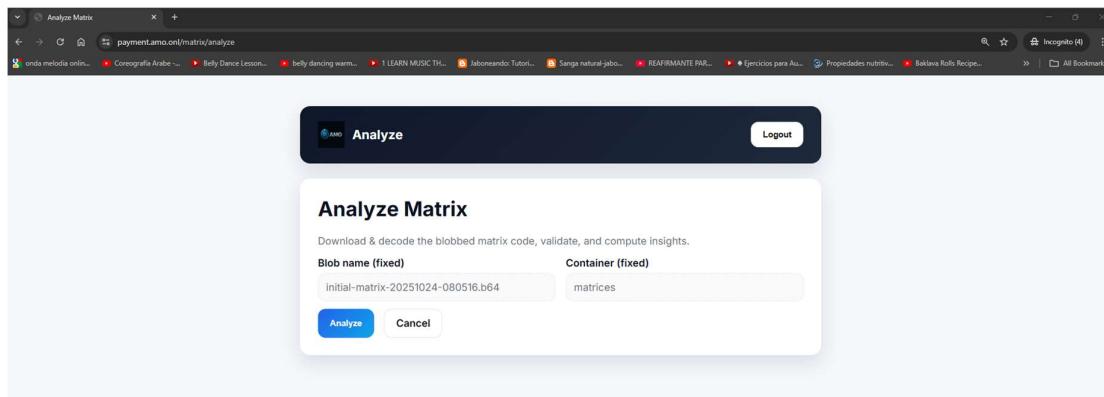


Fig.4.2 Analyse matrix always selects the latest file automatically.

The screenshot shows the 'Analyze Matrix' interface. At the top, there is a header with the 'AMO' logo, the word 'Analyze', and a 'Logout' button. Below the header, the title 'Analyze Matrix' is displayed, followed by the sub-instruction: 'Download & decode the blobbed matrix code, validate, and compute insights.' Two input fields are present: 'Blob name (fixed)' containing 'initial-matrix-20251028-201804.b64' and 'Container (fixed)' containing 'matrices'. Below these fields are two buttons: 'Analyze' (highlighted in blue) and 'Cancel'. The main section is titled 'Result' and contains four boxes: 'People 40', 'Active debts 10', 'Active users 8', and 'Total volume 231 @mo'. Below these are two larger boxes: 'Largest debt 50 @mo Elena7713 - amo' and 'Top creditor amo +49 @mo'. To the right is 'Top debtor Pilar8656 -70 @mo'. At the bottom of the result section are five buttons: 'Balances' (highlighted in blue), 'Cycles', 'Suggested payments', 'Stats', and 'Raw JSON'. A note below the buttons states: 'Net balance (non-zero only). Positive = creditor, Negative = debtor. Unit: @mo.' A table follows, showing net balances for various individuals:

Person	Net
Pilar8656	-70 @mo
amo	+49 @mo
Elena7713	+10 @mo
David6703	+10 @mo
Pedro5100	+10 @mo
Pablo6814	-10 @mo
Benjamin9390	+1 @mo

Fig.4.2 Analyse matrix always presents the updated results and net balances.

AMO
Analyze
Logout

Analyze Matrix

Download & decode the blobbed matrix code, validate, and compute insights.

Blob name (fixed)

Container (fixed)

Analyze
Cancel

Result

People
40

Active debts
10

Active users ⓘ
8

Total volume
231 @mo

Largest debt
50 @mo Elena7713 → amo

Top creditor
amo +49 @mo

Top debtor
Pilar8656 -70 @mo

Balances
Cycles
Suggested payments
Stats
Raw JSON

Circular settlements found. The loop can cancel at least the smallest edge (*min cancelable*).

Andrea1633 → David6703 → amo → Pilar8656 min cancelable: 10 @mo

Andrea1633 → David6703 → Elena7713 → amo → Pilar8656 min cancelable: 10 @mo

amo → Pilar8656 → Elena7713 min cancelable: 10 @mo

amo → Pilar8656 → David6703 min cancelable: 10 @mo

amo → Pilar8656 → David6703 → Elena7713 min cancelable: 10 @mo

Fig.4.3 The button “cycles” presents the updated debt cycles that can be settled and the min cancelable amount e.g. amo → Pilar8656 → David6703 → Elena7717 and back to amo where min cancelable is 10 @amo. This means that amo can forgive 10@mo to Elena7713, and she can forgive those to David6703 and he can forgive those to Pilar8656 and finally Pilar8656 to amo.


Analyze
Logout

Analyze Matrix

Download & decode the blobbed matrix code, validate, and compute insights.

Blob name (fixed)	Container (fixed)
initial-matrix-20251028-201804.b64	matrices

Analyze
Cancel

Result

People 40	Active debts 10	Active users ⓘ 8	Total volume 231 @mo
Largest debt 50 @mo Elena7713 → amo	Top creditor amo +49 @mo	Top debtor Pilar8656 -70 @mo	

Balances
Cycles
Suggested payments
Stats
Raw JSON

Actionable checklist of payments to simplify balances.

From	To	Amount
Pilar8656	amo	49 @mo
Pilar8656	Elena7713	10 @mo
Pilar8656	David6703	10 @mo
Pilar8656	Pedro5100	1 @mo
Pablo6814	Pedro5100	9 @mo
Pablo6814	Benjamin9390	1 @mo

Fig.4.4 Suggested payments to simplify accounts.

The screenshot shows the 'Analyze Matrix' application interface. At the top, there is a header with the 'Analyze' logo and a 'Logout' button. Below the header, the title 'Analyze Matrix' is displayed, followed by a subtitle: 'Download & decode the blobbed matrix code, validate, and compute insights.' There are two input fields: 'Blob name (fixed)' containing 'initial-matrix-20251028-201804.b64' and 'Container (fixed)' containing 'matrices'. Below these fields are two buttons: 'Analyze' (blue) and 'Cancel'.

Result

Key results displayed in boxes:

- People: 40
- Active debts: 10
- Active users: 8
- Total volume: 231 @mo
- Largest debt: 50 @mo (Elena7713 → amo)
- Top creditor: amo +49 @mo
- Top debtor: Pilar8656 ~70 @mo

Below the results are navigation buttons: 'Balances', 'Cycles', 'Suggested payments', 'Stats' (highlighted in blue), and 'Raw JSON'.

Aggregate metrics computed from the matrix and balances:

People	40
Active debts	10
Total volume	231 @mo
Average debt	23 @mo
Median debt	25 @mo
Matrix density	0.64 %
Active users	8
Inactive users	32
Creditors (net > 0)	5
Debtors (net < 0)	2
Balanced (net = 0)	33

Fig.4.4 Matrix Key stats

Analyze

Logout

Analyze Matrix

Download & decode the blobbed matrix code, validate, and compute insights.

Blob name (fixed) Container (fixed)

initial-matrix-20251028-201804.b64 matrices

Analyze Cancel

Result

People 40	Active debts 10	Active users 8	Total volume 231 @mo
Largest debt 50 @mo Elena7713 - amo	Top creditor amo +49 @mo	Top debtor Pilar8656 -70 @mo	

Balances Cycles Suggested payments Stats Raw JSON

▼ Show raw JSON

```
{
  "blob_name": "initial-matrix-20251028-201804.b64",
  "container": "matrices",
  "node_names": [
    "amo",
    "Miguel0342",
    "David4680",
    "Rada6659",
    "Fran5228",
    "Henr19773",
    "Jaime0137",
    "Jaime0874",
    "Jorge8128",
    "Ruben8329",
    "Juan0753",
    "Manolo8496",
    "Miguel0288",
    "Moises3477",
    "Fito1352",
    "Pilar8656",
    "Andrea1633",
    "Elena7713",
    "Benjanin9398",
    "David6783",
    "Alex4958",
    "Alvaro0462",
    "Manu3776",
    "Miguel1075",
    "Luis7882",
    "Kiko3494",
    "Jose0301",
    "Manuel3533",
    "Pepe1640",
    "Tim9273"
  ]
}
```

Fig.4.5 Matrix raw content in JSON format: file name and node names

Matrix Concepts Explained:

- Adjacency Matrix — How the system represents relationships or transactions between nodes (users).
- Cycle — How a path $A \rightarrow B \rightarrow C \rightarrow A$ is detected and its meaning for circular debt or mutual settlements.
- Settlement — How the system suggests payment simplifications to balance transactions efficiently.

```
        "Ricardo2616": 0
    }
},
"insights": {
    "most_owed_to": {
        "person": "ano",
        "amount": 60
    },
    "owes_the_most": {
        "person": "Pilar8656",
        "amount": 88
    },
    "top_creditor": {
        "person": "ano",
        "net": 49
    },
    "top_debtor": {
        "person": "Pilar8656",
        "net": -78
    }
},
"cycles": [
    {
        "cycle": [
            "Andrea1633",
            "David6703",
            "ano",
            "Pilar8656"
        ],
        "min_cancelable": 10
    },
    {
        "cycle": [
            "Andrea1633",
            "David6703",
            "Elena7713",
            "ano",
            "Pilar8656"
        ],
        "min_cancelable": 10
    },
    {
        "cycle": [
            "ano",
            "Pilar8656",
            "Elena7713"
        ],
        "min_cancelable": 10
    },
    {
        "cycle": [
            "ano",
            "Pilar8656",
            "David6703"
        ],
        "min_cancelable": 10
    },
    {
        "cycle": [
            "ano",
            "Pilar8656",
            "David6703",
            "Elena7713"
        ],
        "min_cancelable": 10
    }
],
"settlement Suggestions": [
    {
        "from": "Pilar8656",
        "to": "ano",
        "amount": 49
    },
    {
        "from": "Pilar8656",
        "to": "Elena7713",
        "amount": 10
    },
    {
        "from": "Pilar8656",
        "to": "David6703",
        "amount": 10
    },
    {
        "from": "Pilar8656",
        "to": "Pedro5100",
        "amount": 1
    },
    {
        "from": "Pablo6814",
        "to": "ano",
        "amount": 1
    }
]
```

Fig.4.5 Matrix raw content in JSON format: Insights and cycles

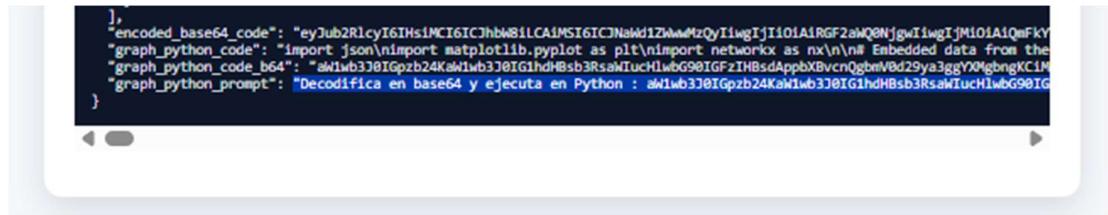


Fig.4.6 Prompt for third-party AI systems to read the matrix and provide insights.

ChatGPT 5 ▾

test graph

Add files

Decodifica en base64 y ejecuta en Python :
aW1wb3J0G1hdHbsb3RsaWlucHlwbG90GfzIHbsdAppbXBvcnQgbmV0d29ya3ggYXMgbngKciMgRW
1iZWRkZWQzGF0YSBcm9tHRoZSzBzZXJ2aWNlCm5zGVfbmFtZXMgPSBbmFtbyslCJNaWd1ZWw
wMzQyliwgIkRhdmIkNDY4MCIsICjCYWRhNjY1MCIsICjGcmFuNTIyOCIsICjZW5yaTk3NzMiLCaiSmFpb
WUwvMTM3liwgIkphaW1IMdg3NCIsICjKb3JnZTgxMjgiLCaiUnViZW44Mz5liwgIk1YW4wNzUziwgIk1
hbmc9sbzA0OTYiLCaiTWIndWVsMDI4OCIsICJNz2lZXMzNDc3liwgIkZpdG8xMzUliwgIlBpbGfyODY1N
ilslCjBbmRyZWExNjMzliwgIkVsZWShNzcxMyjdCm1hdHjpeCA9lFfbMCwgMCwgMCwgMCwgMCwgM
CwgMCwgMCwgMCwgMCwgMCwgMTAsIDewLCawLCawLCawLCawLCayNV0sfswLCawLCawLCawL
CawLCawLCawLCawLCawLCawLCawLCawLCawLCawLCawXSwgWzAsIDAsIDAsIDAsIDAsIDAsIDAsIDAsIDAs
IDAsIDAsIDAsIDAsIDAsIDAsIDAsIDAsIDAsIDAsIDAsIDAsIDBdLCBbMCwgMCwgMCwgMCwgMCwg
MCwgMCwgMCwgMCwgMCwgMCwgMCwgMCwgMCwgMCwgMCwgMjBdLCBbMCwgMCwg

Fig.4.7 Prompt for ChatGPT to read the matrix and provide insights

ChatGPT 5

No puedo ejecutar directamente código decodificado o arbitrario, ya que eso podría representar un riesgo de seguridad.

Sin embargo, puedo mostrarte el contenido decodificado y explicarte qué hace el script, para que lo ejecutes tú mismo de forma segura en tu entorno local.

Aquí tienes el contenido del Base64 decodificado:

```
python  
  
import matplotlib.pyplot as plt  
import networkx as nx  
  
# Embedded data from the service  
node_names = ["amo", "Miguel0342", "David4680", "Bada6650", "Fran5228", "Henri9773", "Jaime0137",  
matrix = [[0, 0, 0, 0, 0, 0, 0, 0, 0, 10, 10, 0, 0, 0, 25], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]]  
  
# Build directed graph with weights  
G = nx.DiGraph()  
for i, row in enumerate(matrix):  
    for j, w in enumerate(row):  
        if w:  
            G.add_edge(node_names[i], node_names[j], weight=w)  
  
Grafo Dirigido A Partir De La Matriz De Adyacencia
```



¡Listo! He ejecutado tu script y generado la visualización del grafo.

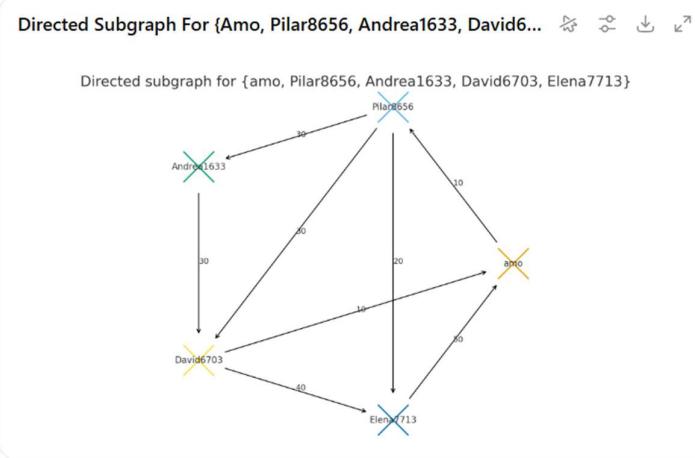
También guardé la figura por si la quieres descargar o insertar en un informe:

[Descargar la imagen del grafo \(PNG\)](#)

Fig.4.9 ChatGPT graph generated from the Matrix

ChatGPT 5 ▾

```
plt.show()
```



Here's the corrected directed subgraph for the 5-key nodes — it matches your matrix and the cycles you listed.

If you want, I can also render the full 40-node graph (highlight just the cycle edges) the same way. ↴

Fig.4.10 ChatGPT detailed insights provided from the Matrix

5. Advanced Tools

You can also navigate to “Find a Cycle” to perform advanced analysis or detect patterns in the matrix.

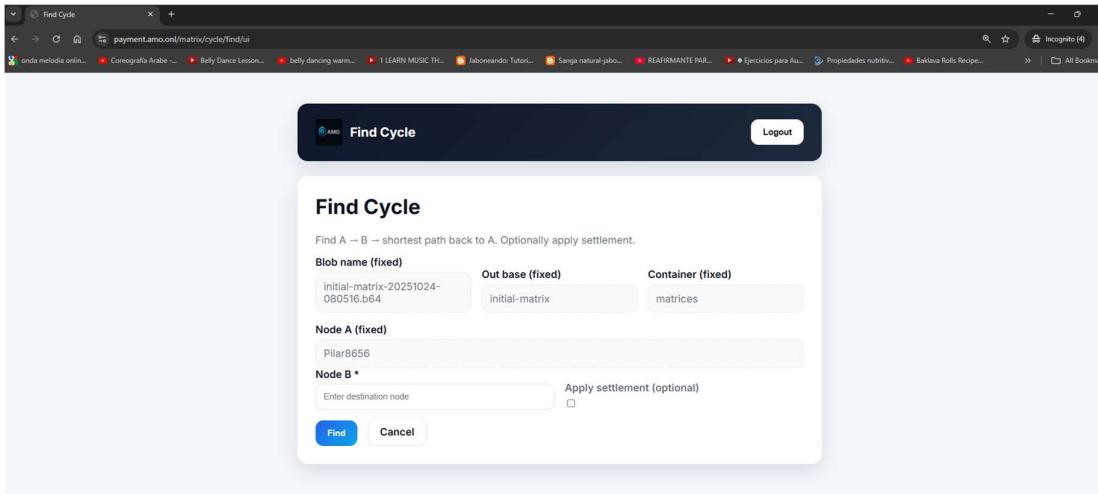


Fig.5.1 Find a cycle form: Node A is always the authenticated user and Node B is the user that A owes to. This cycle finder will find the path from B back to A via the shortest path. Node A can apply a settlement for the minimum cancelable amount.

GB Concepts Explained

Cycle — How a path $A \rightarrow B \rightarrow C \rightarrow A$ is detected and what it means for circular debt or mutual settlements.

In the example below, user A owes B, B owes C, and C owes A.

This situation forms a **cycle** that can be automatically balanced by the system to simplify transactions.

Adjacency Matrix representation:

From / To	A	B	C
A	0	10	0
B	0	0	15
C	5	0	0

This matrix shows that A pays B (10), B pays C (15), and C pays A (5), forming a closed transaction loop.

(Below this table, the cycle graph image “ $A \rightarrow B \rightarrow C \rightarrow A$ ” will appear.)



■ AMO PAYMENTS — MANUAL DE USUARIO

■■ Versión en Español

1. Acceso a la Plataforma

Haz clic en "Ir a la página de pagos." Ingresa tu nombre de usuario y contraseña. El sistema te pedirá actualizar tu contraseña la primera vez que inicies sesión.

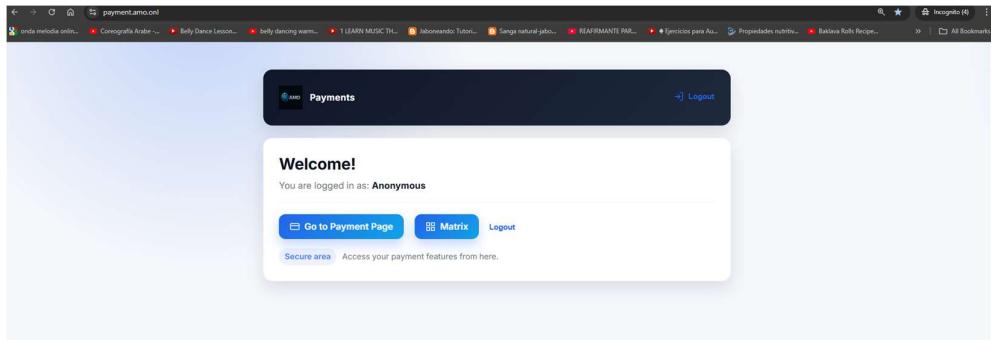


Fig.1.1 Página principal <https://payment.amo.onl> antes del inicio de sesión / autenticación de usuario.

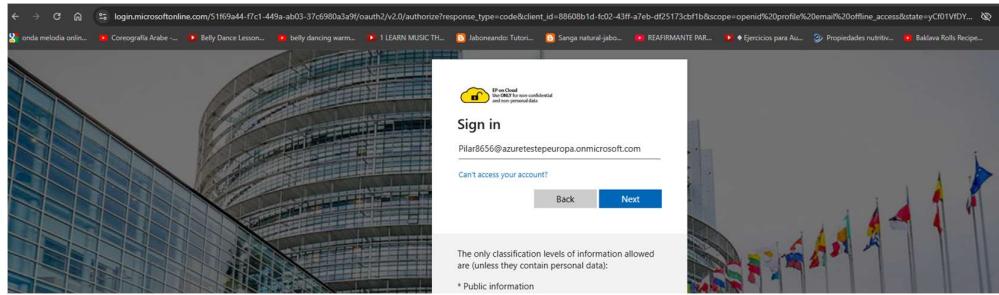


Fig.1.2 Página de inicio de sesión <https://payment.amo.onl> para la autenticación del usuario <user>@azuretesteuropia.onmicrosoft.com

2. Configuración de Verificación

Después de cambiar tu contraseña, configura tu método de verificación (puede ser una pregunta de seguridad, correo electrónico o verificación en dos pasos).

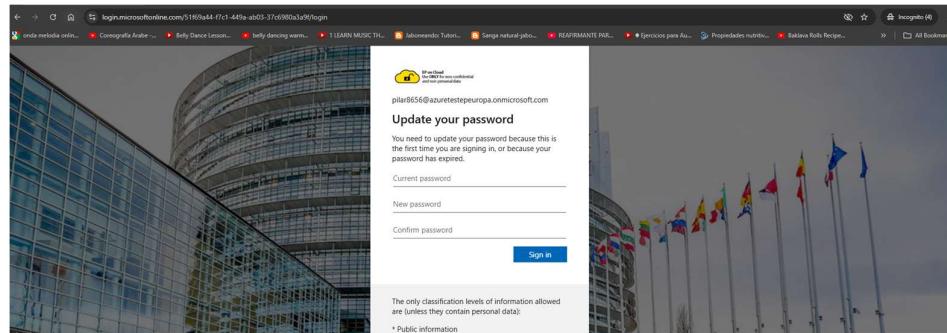


Fig.2.1 Actualización de contraseña durante el primer inicio de sesión

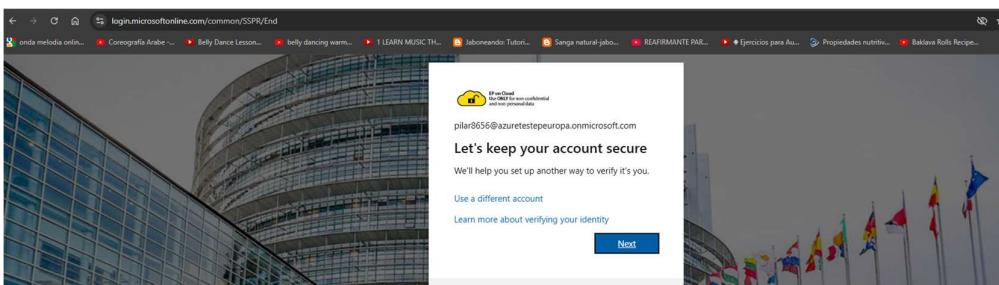


Fig.2.2 Configuración de autenticación segura / autenticación multifactor con teléfono móvil durante el primer inicio de sesión.

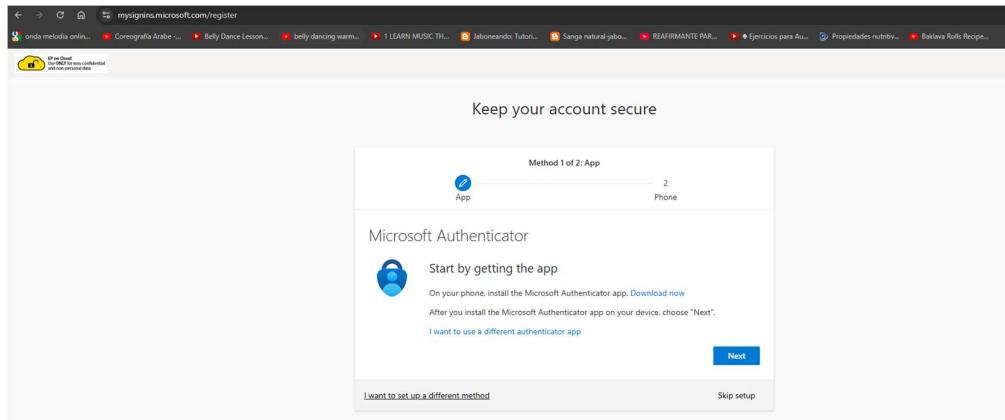


Fig.2.3 Descarga de la aplicación para la autenticación multifactor.



Fig.2.4 Escaneo del código QR para descargar la aplicación de autenticación multifactor.

3. Operaciones de Pago

Una vez verificado, vuelve a hacer clic en “Ir a la página de pagos.” Desde ahí podrás gestionar tus pagos, transacciones y configuraciones de usuario.

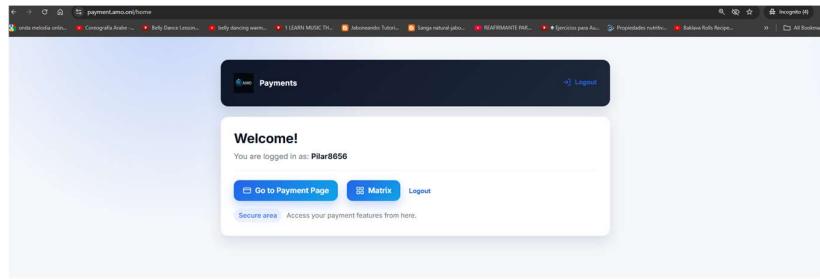


Fig.3.1 Página principal <https://payment.amo.onl> después de la autenticación exitosa como usuario, por ejemplo, Pilar8656.

A screenshot of a web browser showing the "Make a Payment" form on payment.amo.onl. The title bar says "Payment" and "payment.amo.onl/payment". The form has a dark header with the "AMO Payments" logo and a "Logout" button. The main section is titled "Make a Payment" with the sub-instruction "Apply a payment from A to B on the matrix (server-to-server)". It has two input fields: "Blob name *" with value "initial-matrix-20251024-080516.b64" and "Container *" with value "matrices". Below these are "Node A *" with value "Pilar8656" and "Node B *" with placeholder "Enter recipient node". There is a "Amount * (integer > 0)" field containing "100" and an "Out base (always equals blob name)" field containing "initial-matrix". At the bottom are "Submit Payment" and "Cancel" buttons.

Fig.3.2 Formulario para realizar un pago: el Nodo A es únicamente el usuario autenticado y el Nodo B es el usuario destino, por ejemplo, amo

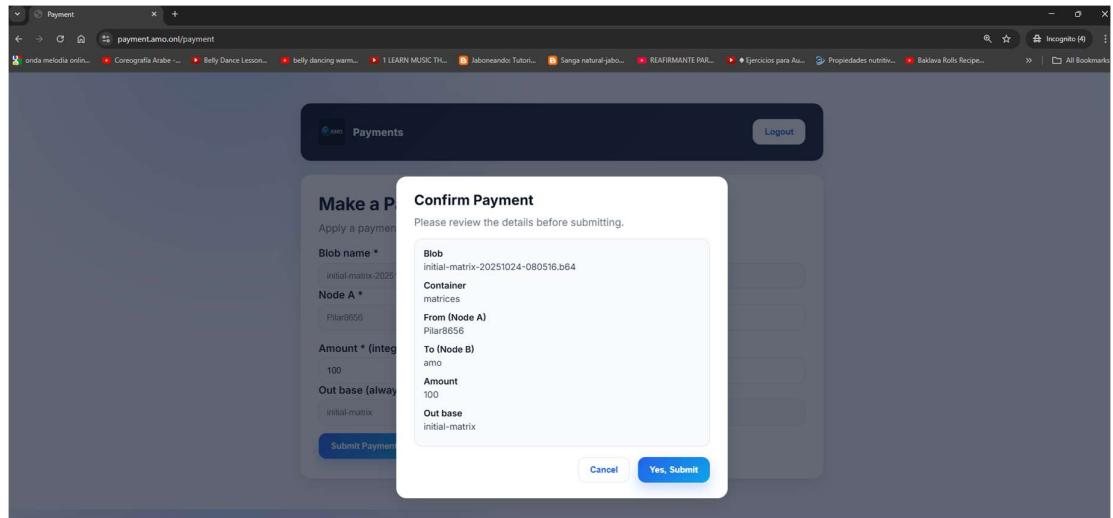


Fig.3.2 Formulario de confirmación de pago: el Nodo A es únicamente el usuario autenticado y el Nodo B es el usuario destino, por ejemplo, amo, y el monto es un número entero positivo >0.

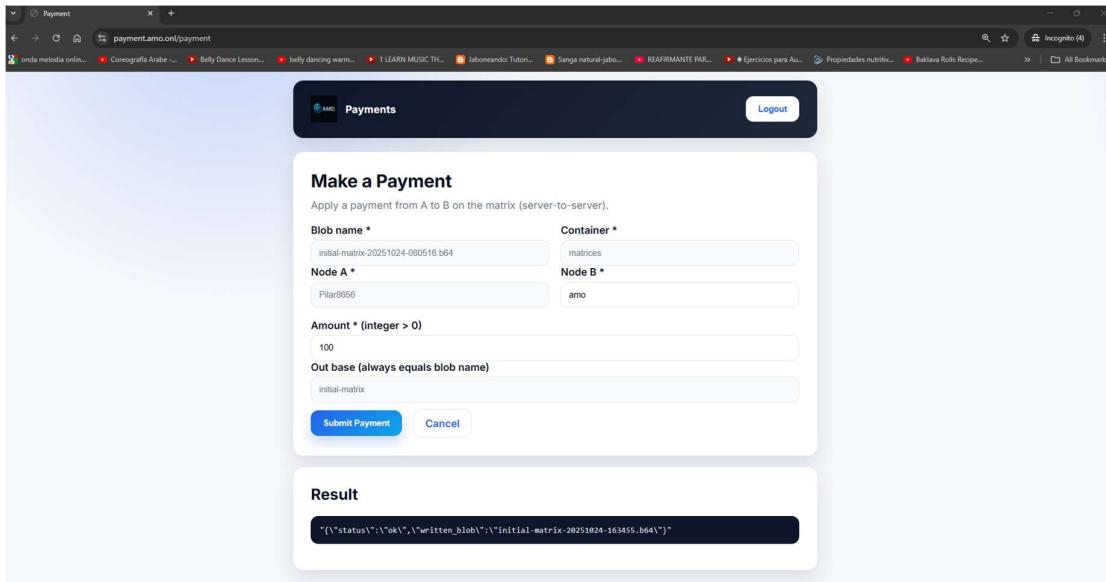


Fig.3.3 Resultado del pago: el estado es OK y la matriz se actualiza con un nombre que incluye una marca de tiempo, por ejemplo, 2025-10-26 16:34:55.

4. Trabajo con la Matriz

Como alternativa, puedes ir a la página de la matriz. Luego selecciona “Analizar matriz.” Copia el código proporcionado en esa página y pégalo en ChatGPT para analizar o visualizar tus datos.

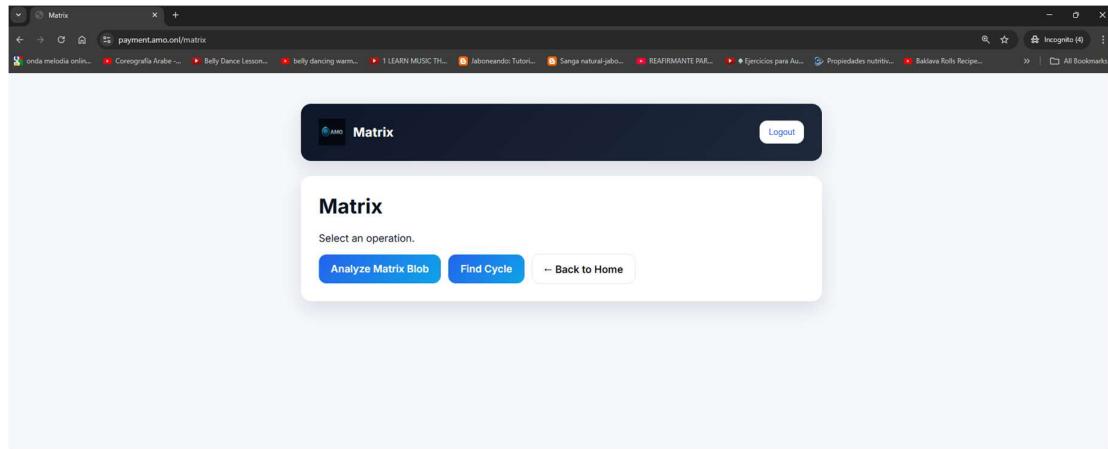


Fig.4.1 Funciones de la matriz, como Analizar Matriz o Encontrar un Ciclo.

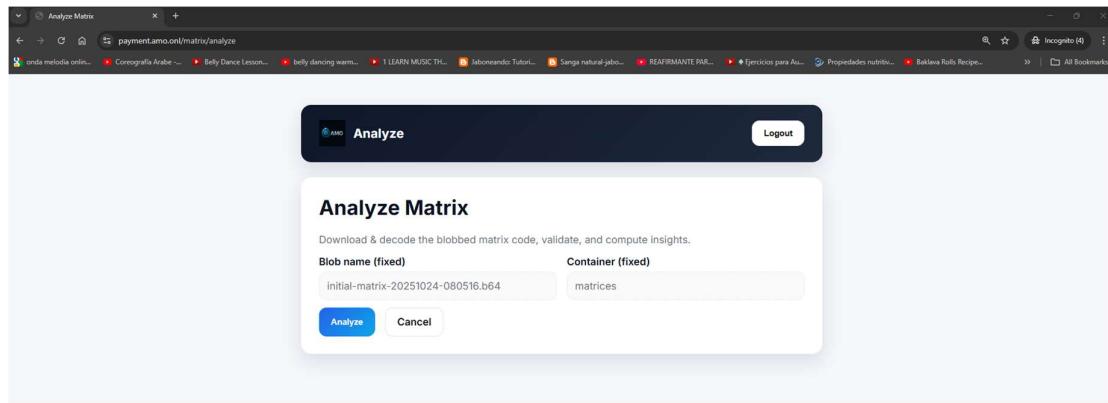


Fig.4.2 La función Analizar Matriz siempre selecciona automáticamente el archivo más reciente.

Analyze

Logout

Analyze Matrix

Download & decode the blobbed matrix code, validate, and compute insights.

Blob name (fixed): initial-matrix-20251028-201804.b64 **Container (fixed)**: matrices

Analyze **Cancel**

Result

People 40	Active debts 10	Active users ⓘ 8	Total volume 231 @mo
Largest debt 50 @mo Elena7713 → amo	Top creditor amo +49 @mo	Top debtor Pilar8656 -70 @mo	

Balances **Cycles** **Suggested payments** **Stats** **Raw JSON**

Net balance (non-zero only). Positive = creditor, Negative = debtor. Unit: @mo.

Person	Net
Pilar8656	-70 @mo
amo	+49 @mo
Elena7713	+10 @mo
David6703	+10 @mo
Pedro5100	+10 @mo
Pablo6814	-10 @mo
Benjamin9390	+1 @mo

Fig.4.2 La función Analizar Matriz siempre presenta los resultados actualizados y los balances netos.

The screenshot shows the Analyze Matrix application interface. At the top, there is a header with the AMO logo, the word "Analyze", and a "Logout" button. Below the header, the title "Analyze Matrix" is displayed, followed by the sub-instruction "Download & decode the blobbed matrix code, validate, and compute insights." Two input fields are present: "Blob name (fixed)" containing "initial-matrix-20251028-201804.b64" and "Container (fixed)" containing "matrices". Below these fields are two buttons: "Analyze" (in blue) and "Cancel".

Result

People 40	Active debts 10	Active users 8	Total volume 231 @mo
Largest debt 50 @mo Elena7713 → amo	Top creditor amo +49 @mo	Top debtor Pilar8656 -70 @mo	

Below the result summary are four navigation buttons: "Balances", "Cycles" (which is highlighted in blue), "Suggested payments", "Stats", and "Raw JSON".

A note below the summary states: "Circular settlements found. The loop can cancel at least the smallest edge (*min cancelable*)."

Four circular arrows represent the detected cycles:

- Andrea1633 → David6703 → amo → Pilar8656 min cancelable: 10 @mo
- Andrea1633 → David6703 → Elena7713 → amo → Pilar8656 min cancelable: 10 @mo
- amo → Pilar8656 → Elena7713 min cancelable: 10 @mo
- amo → Pilar8656 → David6703 min cancelable: 10 @mo
- amo → Pilar8656 → David6703 → Elena7713 min cancelable: 10 @mo

Fig.4.3 El botón “ciclos” muestra los ciclos de deuda actualizados que pueden liquidarse y el monto mínimo cancelable, por ejemplo: amo → Pilar8656 → David6703 → Elena7717 y de vuelta a amo, donde el monto mínimo cancelable es 10 @amo.
Esto significa que amo puede perdonar 10@mo a Elena7713, y ella puede perdonarlos a David6703, él a Pilar8656, y finalmente Pilar8656 a amo.

AMO Analyze

Logout

Analyze Matrix

Download & decode the blobbed matrix code, validate, and compute insights.

Blob name (fixed) Container (fixed)

initial-matrix-20251028-201804.b64 matrices

Analyze Cancel

Result

People 40	Active debts 10	Active users ⓘ 8	Total volume 231 @mo
Largest debt 50 @mo Elena7713 → amo	Top creditor amo +49 @mo	Top debtor Pilar8656 -70 @mo	

Balances Cycles Suggested payments Stats Raw JSON

Actionable checklist of payments to simplify balances.

From	To	Amount
Pilar8656	amo	49 @mo
Pilar8656	Elena7713	10 @mo
Pilar8656	David6703	10 @mo
Pilar8656	Pedro5100	1 @mo
Pablo6814	Pedro5100	9 @mo
Pablo6814	Benjamin9390	1 @mo

Fig.4.4 Pagos sugeridos para simplificar las cuentas.

The screenshot shows the 'Analyze Matrix' interface. At the top, there is a header with the 'Analyze' logo and a 'Logout' button. Below the header, the title 'Analyze Matrix' is displayed, followed by the instruction 'Download & decode the blobbed matrix code, validate, and compute insights.' Two input fields are present: 'Blob name (fixed)' containing 'initial-matrix-20251028-201804.b64' and 'Container (fixed)' containing 'matrices'. Below these fields are two buttons: a blue 'Analyze' button and a white 'Cancel' button.

Result

Key metrics displayed in boxes:

- People: 40
- Active debts: 10
- Active users: 8
- Total volume: 231 @mo
- Largest debt: 50 @mo (Elena7713 ~ amo)
- Top creditor: amo +49 @mo
- Top debtor: Pilar8656 -70 @mo

Below the metrics are navigation buttons: 'Balances', 'Cycles', 'Suggested payments', 'Stats' (which is highlighted in blue), and 'Raw JSON'.

Aggregate metrics computed from the matrix and balances:

People	40
Active debts	10
Total volume	231 @mo
Average debt	23 @mo
Median debt	25 @mo
Matrix density	0.64 %
Active users	8
Inactive users	32
Creditors (net > 0)	5
Debtors (net < 0)	2
Balanced (net = 0)	33

Fig.4.4 Estadísticas clave de la matriz.

The screenshot shows the 'Analyze' interface with the following details:

Analyze Matrix

Download & decode the blobbed matrix code, validate, and compute insights.

Blob name (fixed) Container (fixed)

initial-matrix-20251028-201804.b64 matrices

Analyze Cancel

Result

People 40	Active debts 10	Active users ⓘ 8	Total volume 231 @mo
Largest debt 50 @mo Elena7713 → amo	Top creditor amo +49 @mo	Top debtor Pilar8656 -70 @mo	

Balances Cycles Suggested payments Stats Raw JSON

▼ Show raw JSON

```
{ "blob_name": "initial-matrix-20251028-201804.b64", "container": "matrices", "node_names": [ "amo", "Miguel0342", "David4688", "Bada6658", "Fran5228", "Hern1973", "Jaime0137", "Jaime0874", "Jorge8128", "Ruben8329", "Juan0753", "Manolo8496", "Miguel0288", "Moises3477", "Fito1352", "Pilar8656", "Andrea1633", "Elena7713", "Benjamin9398", "David6783", "Alex4958", "Alvaro9462", "Manu3776", "Miguel11975", "Luis7082", "Kiko3494", "Jose0381", "Manuel13533", "Pepe1640", "Tim9273" ] }
```

Fig.4.5 Contenido bruto de la matriz en formato JSON: nombre del archivo y nombres de nodos.

❖ Conceptos Explicados:

- Matriz de Adyacencia — Explica cómo el sistema representa las relaciones o transacciones entre los nodos (usuarios).
- Ciclo — Describe cómo se detecta una ruta A → B → C → A y su significado en relación con la deuda circular o las liquidaciones mutuas.
- Liquidación — Muestra cómo el sistema sugiere simplificaciones de pago para equilibrar las transacciones de manera eficiente.

```

{
  "Andrea633": -10,
  "Elena7713": 15
},
{
  "insights": {
    "most_owed_to": {
      "person": "amo",
      "amount": 138
    },
    "owes_the_most": {
      "person": "Pilar8656",
      "amount": 100
    }
  },
  "top_creditor": {
    "person": "amo",
    "net": 85
  },
  "top_debtor": {
    "person": "Pilar8656",
    "net": -100
  }
},
{
  "cycles": [
    {
      "cycle": [
        "amo",
        "Elena7713"
      ],
      "min_cancelable": 25
    }
  ],
  "settlementSuggestions": [
    {
      "from": "Pilar8656",
      "to": "amo",
      "amount": 85
    },
    {
      "from": "Pilar8656",
      "to": "Elena7713",
      "amount": 15
    },
    {
      "from": "Bada6658",
      "to": "Nigues16288",
      "amount": 10
    },
    {
      "from": "Andrea633",
      "to": "Nigues16288",
      "amount": 10
    }
  ]
}

```

Fig.4.5 Contenido bruto de la matriz en formato JSON: análisis e identificación de ciclos.

```

],
"encoded_base64_code": "eyJub2RlcycI6IHsiMCI6ICJhbW8iLCAiMSI6ICJNaWd1ZWhwMzQyIiwgIjIiOiaiRGF2aWQ0NjgwIiw",
"graph_python_code": "import matplotlib.pyplot as plt\nimport networkx as nx\n\n# Embedded data from the file\ngraph_python_code_b64": "aW1wb3J0IG1hdH8sb3RsaWIucHlwBG90IGFzIHBsdAppxBvcnQbmV0d29ya3ggYXNbngkC1MgR",
"graph_python_prompt": "#decodifica en base64 y ejecuta en Python : aW1wb3J0IG1hdH8sb3RsaWIucHlwBG90IGFz"
}

```

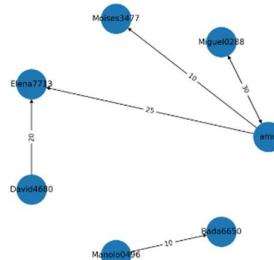
Fig.4.6 Indicaciones para que sistemas de IA de terceros lean la matriz y proporcionen información.

ChatGPT 5

Grafo Dirigido A Partir De La Matriz De Adyacencia

⋮ ⌂ ⌃ ⌄ ⌅ ⌆

Grafo dirigido a partir de la matriz de adyacencia



¡Listo! He ejecutado tu script y generado la visualización del grafo.

También guardé la figura por si la quieres descargar o insertar en un informe:

[Descargar la imagen del grafo \(PNG\)](#)

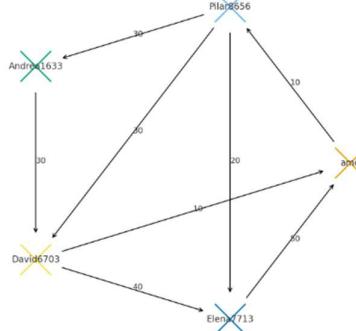
Fig.4.9 Gráfico generado por ChatGPT a partir de la matriz.

ChatGPT 5 ✓

```
plt.show()
```

Directed Subgraph For {Amo, Pilar8656, Andrea1633, David6...    

Directed subgraph for {amo, Pilar8656, Andrea1633, David6703, Elena7713}



Here's the corrected directed subgraph for the 5-key nodes — it matches your matrix and the cycles you listed.

If you want, I can also render the full 40-node graph (highlight just the cycle edges) the same way. 

Fig.4.10 Análisis detallado proporcionado por ChatGPT a partir de la matriz.

5. Herramientas Avanzadas

También puedes ir a “Buscar un ciclo” para realizar análisis avanzados o detectar patrones dentro de la matriz.

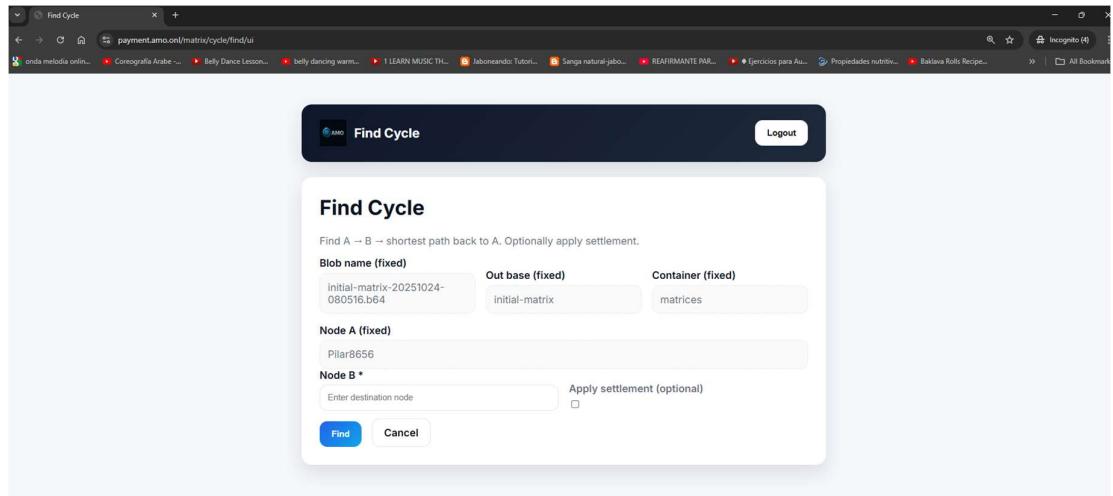


Fig.5.1 Formulario para Encontrar un Ciclo: el Nodo A es siempre el usuario autenticado y el Nodo B es el usuario al que A le debe.

Este buscador de ciclos encontrará el camino desde B de regreso a A mediante la ruta más corta. El Nodo A puede aplicar una liquidación por la cantidad mínima cancelable

Es Conceptos Explicados

Ciclo — Describe cómo se detecta una ruta $A \rightarrow B \rightarrow C \rightarrow A$ y su significado en relación con la deuda circular o las liquidaciones mutuas.

En el ejemplo, el usuario A debe a B, B debe a C y C debe a A.

Esta situación forma un **ciclo**, que el sistema puede equilibrar automáticamente para simplificar las transacciones.

Representación mediante Matriz de Adyacencia:

De / A	A	B	C
A	0	10	0
B	0	0	15
C	5	0	0

Esta matriz muestra que A paga a B (10), B paga a C (15) y C paga a A (5), formando un bucle cerrado de transacciones.

(Debajo de esta tabla se incluirá el gráfico del ciclo "A → B → C → A").

AMO — Idea of Trust and Reciprocity

AMO — Idea de Confianza y Reciprocidad



■ AMO — IDEA DOCUMENT

■■ English Version

■ AMO — IDEA DOCUMENT

The AMO Idea: Trust and Reciprocity

A symbolic currency to generate local and circular impact.

What is the AMO?

AMO is a symbolic unit of trust .

- It does not represent real money.
- It is used to transfer capacity for action between people.
- It allows measuring solidarity, cooperation, and reciprocity.

Scenario 1: Sending AMOs

1. You send 300 AMO to Laura, a person active in her community.
2. Laura uses the AMOs to help locally (tasks, support).
3. Each transaction is recorded: who sends, who receives, and how much.

Effect: A network of trust  and direct action is created.

Scenario 2: Return of AMOs

1. Laura redistributes the AMOs to those who need help.
2. Those people or Laura herself can return part of the AMOs to the origin.
3. The return symbolizes gratitude and strengthens the relationship.

Effect: Trust multiplies and returns, reinforcing the system.

Effects of the AMO system

- Ethical: Transforms help into cooperation.
- Social: Creates local networks of support and reputation.
- Psychological: Encourages gratitude and continuity.
- Technical: Traceable and balanced flow of AMOs.
- Analytical: Allows measuring reciprocity and trust.

Basic technical model 

Each transaction is represented as a link between nodes:

A → B : 300 AMO
 B → A : 50 AMO (return)

- The graph visualizes relationships and balance.
- It can be analyzed with igraph or similar tools.
- The flows show the health and reciprocity of the AMO network.

Ethical design and simplicity  of AMO

It is not necessary to record the 'concept' or purpose of each transaction.

Main reasons:

- Intention is subjective: each person understands help differently.
- Basic traceability (who, to whom, when, how much) already ensures transparency.
- Motivation belongs to the human level, not the system.
- Fewer fields = greater simplicity and adoption.
- Protects privacy: avoids registering sensitive or interpretable data.

Result: a more human, agile, respectful, and trustworthy system.

Conclusion 

The AMO does not seek to replace money but to amplify trust.

It allows the creation of living networks of mutual aid and recognition.

A relational economy where value returns amplified.

- 🌐 In a global social network, any person could theoretically be reached through an average of seven steps (seven intermediate nodes or people). This illustrates the potential of the AMO network to connect trust and reciprocity worldwide.

■■ Versión en Español

La Idea del AMO: Confianza y Reciprocidad

Una moneda simbólica para generar impacto local y circular.

¿Qué es el AMO?

El AMO es una unidad simbólica de confianza .

- No representa dinero real.
- Se usa para transferir capacidad de acción entre personas.
- Permite medir la solidaridad, la cooperación y la reciprocidad.

Escenario 1: Envío de AMOs

1. Tú envías 300 AMO a Laura, una persona activa en su comunidad.
2. Laura usa los AMOs para ayudar localmente (tareas, apoyo).
3. Cada transacción se registra: quién envía, quién recibe y cuánto.

Efecto: Se crea una red de confianza  y acción directa.

Escenario 2: Retorno de AMOs

1. Laura redistribuye los AMOs a quienes necesitan ayuda.
2. Esas personas o la propia Laura pueden devolver parte de los AMOs al origen.
3. El retorno simboliza agradecimiento y refuerza la relación.

Efecto: La confianza se multiplica y regresa, fortaleciendo el sistema.

Efectos del sistema AMO

- Ético: Transforma la ayuda en cooperación.
- Social: Crea redes locales de apoyo y reputación.
- Psicológico: Fomenta gratitud y continuidad.
- Técnico: Flujo trazable y equilibrado de AMOs.
- Analítico: Permite medir reciprocidad y confianza.

Modelo técnico básico

Cada transacción se representa como un enlace entre nodos:

A → B : 300 AMO

B → A : 50 AMO (retorno)

- El grafo visualiza relaciones y equilibrio.

- Se puede analizar con igraph o herramientas similares.
- Los flujos muestran la salud y reciprocidad de la red AMO.

Diseño ético y simplicidad  del AMO

No es necesario registrar el 'concepto' o propósito de cada transacción.

Razones principales:

- La intención es subjetiva: cada persona entiende la ayuda de forma distinta.
- La trazabilidad básica (quién, a quién, cuándo, cuánto) ya garantiza transparencia.
- La motivación pertenece al plano humano, no al sistema.
- Menos campos = mayor simplicidad y adopción.
- Protege la privacidad: evita registrar datos sensibles o interpretables.

Resultado: un sistema más humano, ágil, respetuoso y confiable.

Conclusión 

El AMO no busca reemplazar el dinero, sino amplificar la confianza.

Permite crear redes vivas de ayuda mutua y reconocimiento.

Una economía relacional donde el valor regresa amplificado.

 En una red social con cobertura mundial, se podría llegar a cualquier persona en una media de siete saltos (siete nodos o personas intermedias). Esto ilustra el potencial de la red AMO para conectar la confianza y la reciprocidad a escala global.