ev1-machine-learning-20-oct

October 24, 2024

1 Fase 1 - Business Understanding

El banco Monopoly, con una larga trayectoria en el mercado chileno, ha sido recientemente adquirido por la entidad financiera internacional Dormammu. Ante este cambio, Dormammu ha encomendado a su equipo de ingenieros de datos la tarea de analizar exhaustivamente la base de clientes de Monopoly. El objetivo principal es comprender los hábitos financieros de esta nueva clientela y diseñar estrategias personalizadas que permitan una integración exitosa al ecosistema de Dormammu. Para ello, se ha puesto a disposición de los ingenieros una base de datos que abarca un año de información transaccional de una muestra representativa de clientes de Monopoly. La labor del equipo consiste en limpiar y analizar estos datos, identificando patrones de consumo, preferencias y necesidades financieras. Con esta información, se busca generar insights valiosos que permitan a Dormammu diseñar una oferta de productos y servicios a medida, optimizando así la experiencia del cliente y maximizando la rentabilidad.

Para esto, como equipo analista de datos vamos a darle respuesta a las siguientes incognitas:

- ¿Cuáles son los 3 meses de mayor uso de tarjetas de crédito a nivel nacional e internacional?
- ¿Existen diferentes grupos de clientes basados en su comportamiento financiero, como el uso de tarjetas de crédito, nivel de deuda y productos contratados?
- ¿Cuál es la probabilidad de que los clientes con ciertas características demográficas o comportamiento histórico caigan en mora?
- ¿Los clientes con mayor antigüedad o que usan múltiples productos son más fieles al banco?
- ¿Los clientes con dualidad (dos o más tarjetas de crédito) son más propensos a utilizar servicios adicionales como avances en cuotas o compras internacionales?

Con lo expuesto anteriormente, se espera responder satisfactoriamente a estas preguntas para que el nuevo dueño del banco pueda tener información sólida y conocer a mayor profundidad las interacciones económicas de sus clientes.

2 Fase 2 - Data Understanding

2.0.1 A continuación se importarán las librerías necesarias para trabajar en esta metodología.

[1]:
```
#Importación de librerias

%pip install pyarrow
%pip install tpot
%pip install --upgrade setuptools
```

```
%pip install https://github.com/pandas-profiling/pandas-profiling/archive/
 ↪master.zip
%pip install ipywidgets

import os
import pandas as pd
import numpy as np
import seaborn as sb
import matplotlib.pyplot as plt

from tpot import TPOTClassifier, TPOTRegressor
from sklearn import preprocessing
from sklearn.preprocessing import LabelEncoder, OneHotEncoder
from sklearn.preprocessing import StandardScaler, MinMaxScaler
from scipy import stats
from sklearn.feature_selection import SelectKBest
from sklearn.feature_selection import chi2, f_regression
from sklearn.model_selection import train_test_split
from sklearn.ensemble import ExtraTreesClassifier, ExtraTreesRegressor
from sklearn.metrics import mean_absolute_error, mean_squared_error
from sklearn.linear_model import LinearRegression
from sklearn.compose import ColumnTransformer
from sklearn.pipeline import Pipeline
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Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: pyarrow in c:\users\new11\appdata\local\packages\
pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
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Requirement already satisfied: pytz>=2020.1 in c:\users\new11\appdata\local\pack
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Requirement already satisfied: tzdata>=2022.7 in c:\users\new11\appdata\local\pa
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Requirement already satisfied: threadpoolctl>=3.1.0 in c:\users\new11\appdata\lo
cal\packages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local
-packages\python312\site-packages (from scikit-learn>=1.4.1->tpot) (3.5.0)
Requirement already satisfied: colorama in c:\users\new11\appdata\local\packages
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Requirement already satisfied: six>=1.5 in c:\users\new11\appdata\local\packages
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dateutil>=2.8.2->pandas>=0.24.2->tpot) (1.16.0)
Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\new11\appdat
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Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\new11\appdata\loca
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Note: you may need to restart the kernel to use updated packages.
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writeableNote: you may need to restart the kernel to use updated packages.

Requirement already satisfied: setuptools in c:\users\new11\appdata\local\packag
es\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (75.2.0)
Defaulting to user installation because normal site-packages is not writeable
Collecting https://github.com/pandas-profiling/pandas-
profiling/archive/master.zip
  Using cached https://github.com/pandas-profiling/pandas-
profiling/archive/master.zip
  Preparing metadata (setup.py): started
  Preparing metadata (setup.py): finished with status 'done'
Requirement already satisfied: scipy<1.14,>=1.4.1 in c:\users\new11\appdata\loca
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Requirement already satisfied: pydantic>=2 in c:\users\new11\appdata\local\packa
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Requirement already satisfied: visions<0.7.7,>=0.7.5 in c:\users\new11\appdata\l
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Requirement already satisfied: phik<0.13,>=0.11.1 in c:\users\new11\appdata\loca
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Requirement already satisfied: typeguard<5,>=3 in c:\users\new11\appdata\local\p
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Requirement already satisfied: imagehash==4.3.1 in c:\users\new11\appdata\local\
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Requirement already satisfied: wordcloud>=1.9.3 in c:\users\new11\appdata\local\
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Requirement already satisfied: dacite>=1.8 in c:\users\new11\appdata\local\packa
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Requirement already satisfied: numba<1,>=0.56.0 in c:\users\new11\appdata\local\
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Requirement already satisfied: PyWavelets in c:\users\new11\appdata\local\packag
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profiling==0.0.dev0) (1.7.0)
Requirement already satisfied: pillow in c:\users\new11\appdata\local\packages\p
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profiling==0.0.dev0) (10.3.0)
Requirement already satisfied: MarkupSafe>=2.0 in c:\users\new11\appdata\local\p
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profiling==0.0.dev0) (2.1.5)
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Requirement already satisfied: contourpy>=1.0.1 in c:\users\new11\appdata\local\
packages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
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profiling==0.0.dev0) (1.2.1)
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profiling==0.0.dev0) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\new11\appdata\local
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packages\python312\site-packages (from matplotlib<3.10,>=3.5->ydata-
profiling==0.0.dev0) (4.53.0)
Requirement already satisfied: kiwisolver>=1.3.1 in c:\users\new11\appdata\local
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Requirement already satisfied: llvmlite<0.44,>=0.43.0dev0 in c:\users\new11\appd
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Requirement already satisfied: pytz>=2020.1 in c:\users\new11\appdata\local\pack
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Requirement already satisfied: tzdata>=2022.7 in c:\users\new11\appdata\local\pa
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Requirement already satisfied: joblib>=0.14.1 in c:\users\new11\appdata\local\pa
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profiling==0.0.dev0) (1.4.2)
Requirement already satisfied: annotated-types>=0.6.0 in c:\users\new11\appdata\
local\packages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\loc
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profiling==0.0.dev0) (0.7.0)
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Requirement already satisfied: pydantic-core==2.23.4 in c:\users\new11\appdata\l
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Requirement already satisfied: typing-extensions>=4.6.1 in c:\users\new11\appdat
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Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\new11\appdat
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Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\new11\appdata\loca
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packages\python312\site-packages (from requests<3,>=2.24.0->ydata-
profiling==0.0.dev0) (2.2.2)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\new11\appdata\loca
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packages\python312\site-packages (from requests<3,>=2.24.0->ydata-
profiling==0.0.dev0) (2024.7.4)
Requirement already satisfied: patsy>=0.5.6 in c:\users\new11\appdata\local\pack
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profiling==0.0.dev0) (0.5.6)
Requirement already satisfied: colorama in c:\users\new11\appdata\local\packages
\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
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profiling==0.0.dev0) (0.4.6)
Requirement already satisfied: attrs>=19.3.0 in c:\users\new11\appdata\local\pac
kages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
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visions<0.7.7,>=0.7.5->visions[type_image_path]<0.7.7,>=0.7.5->ydata-
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packages\python312\site-packages (from
visions<0.7.7,>=0.7.5->visions[type_image_path]<0.7.7,>=0.7.5->ydata-
profiling==0.0.dev0) (3.3)
Requirement already satisfied: six in c:\users\new11\appdata\local\packages\pyth
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patsy>=0.5.6->statsmodels<1,>=0.13.2->ydata-profiling==0.0.dev0) (1.16.0)
Note: you may need to restart the kernel to use updated packages.
Defaulting to user installation because normal site-packages is not writeable
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```
Requirement already satisfied: ipywidgets in c:\users\new11\appdata\local\packag
es\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (8.1.5)
Requirement already satisfied: comm>=0.1.3 in c:\users\new11\appdata\local\packa
ges\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from ipywidgets) (0.2.2)
Requirement already satisfied: ipython>=6.1.0 in c:\users\new11\appdata\local\pa
ckages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from ipywidgets) (8.25.0)
Requirement already satisfied: traitlets>=4.3.1 in c:\users\new11\appdata\local\
packages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from ipywidgets) (5.14.3)
Requirement already satisfied: widgetsnbextension~=4.0.12 in c:\users\new11\appd
ata\local\packages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache
\local-packages\python312\site-packages (from ipywidgets) (4.0.13)
Requirement already satisfied: jupyterlab-widgets~=3.0.12 in c:\users\new11\appd
ata\local\packages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache
\local-packages\python312\site-packages (from ipywidgets) (3.0.13)
Requirement already satisfied: decorator in c:\users\new11\appdata\local\package
s\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from ipython>=6.1.0->ipywidgets) (5.1.1)
Requirement already satisfied: jedi>=0.16 in c:\users\new11\appdata\local\packag
es\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from ipython>=6.1.0->ipywidgets) (0.19.1)
Requirement already satisfied: matplotlib-inline in c:\users\new11\appdata\local
\packages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from ipython>=6.1.0->ipywidgets) (0.1.7)
Requirement already satisfied: prompt-toolkit<3.1.0,>=3.0.41 in c:\users\new11\a
ppdata\local\packages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localca
che\local-packages\python312\site-packages (from ipython>=6.1.0->ipywidgets)
(3.0.46)
Requirement already satisfied: pygments>=2.4.0 in c:\users\new11\appdata\local\p
ackages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from ipython>=6.1.0->ipywidgets) (2.18.0)
Requirement already satisfied: stack-data in c:\users\new11\appdata\local\packag
es\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from ipython>=6.1.0->ipywidgets) (0.6.3)
Requirement already satisfied: colorama in c:\users\new11\appdata\local\packages
\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from ipython>=6.1.0->ipywidgets) (0.4.6)
Requirement already satisfied: parso<0.9.0,>=0.8.3 in c:\users\new11\appdata\loc
al\packages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from jedi>=0.16->ipython>=6.1.0->ipywidgets)
(0.8.4)
Requirement already satisfied: wcwidth in c:\users\new11\appdata\local\packages\
pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from prompt-
toolkit<3.1.0,>=3.0.41->ipython>=6.1.0->ipywidgets) (0.2.13)
```

```
Requirement already satisfied: executing>=1.2.0 in c:\users\new11\appdata\local\
packages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from stack-data->ipython>=6.1.0->ipywidgets)
(2.0.1)
Requirement already satisfied: asttokens>=2.1.0 in c:\users\new11\appdata\local\
packages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from stack-data->ipython>=6.1.0->ipywidgets)
(2.4.1)
Requirement already satisfied: pure-eval in c:\users\new11\appdata\local\package
s\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from stack-data->ipython>=6.1.0->ipywidgets)
(0.2.2)
Requirement already satisfied: six>=1.12.0 in c:\users\new11\appdata\local\packa
ges\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from asttokens>=2.1.0->stack-
data->ipython>=6.1.0->ipywidgets) (1.16.0)
Note: you may need to restart the kernel to use updated packages.
```

3 OPCIONAL

3.0.1 Se realiza conversión del archivo "Base_clientes_Monopoly.xlsx", al formato de archivo '.parquet', para una mayor eficiencia en la carga y análisis de los datos.

[ ]:
```python
# NO BORRAR - RUTAS DE ARCHIVO DE LOS INTEGRANTES DEL EQUIPO

#df = pd.read_excel("C:/Users/new11/Documents/DUOC - Ing. Informática/2024/
 ↪2024-2/Machine Learning/Dataset Monopoly.xlsx", engine='openpyxl',␣
 ↪sheet_name='Transición de Negocio', header=0)
#df = pd.read_excel("/Users/herna/Desktop/Duoc_UC/6to SEMESTRE/Machine_Learning/
 ↪ET/Base_clientes_Monopoly.xlsx", engine='openpyxl', sheet_name='Transición␣
 ↪de Negocio', header=0)

# ESTABLECER RUTA DEL EXCEL PARA CARGAR EL ARCHIVO
ruta_excel = '/Users/herna/Desktop/Duoc_UC/6to SEMESTRE/Machine_Learning/ET/
 ↪Base_clientes_Monopoly.xlsx'
df = pd.read_excel(ruta_excel, engine='openpyxl')
df.columns = df.iloc[0]
df1 = df.iloc[1:].reset_index(drop=True)

# ESTABLECER RUTA DE SALIDA DEL ARCHIVO PARQUET
ruta_parquet = '/Users/herna/Desktop/Duoc_UC/6to SEMESTRE/Machine_Learning/ET/
 ↪Base_clientes_Monopoly.parquet'
df1.to_parquet(ruta_parquet, engine='pyarrow')  # O usa 'fastparquet' si␣
 ↪prefieres esa opción

print(f"Archivo convertido y guardado en {ruta_parquet}")
```

3.0.2 Se establece la ruta de carga para el archivo parquet.

[63]:
```
# NO BORRAR - RUTAS DE ARCHIVO DE LOS INTEGRANTES DEL EQUIPO

# df = pd.read_parquet('/Users/herna/Desktop/Duoc_UC/6to SEMESTRE/
 ↪Machine_Learning/ET/Base_clientes_Monopoly.parquet', engine='pyarrow')
df = pd.read_parquet("C:/Users/new11/Documents/DUOC - Ing. Informática/2024/
 ↪2024-2/Machine Learning/Datos Banco Monopoly/Base_clientes_Monopoly.
 ↪parquet", engine='pyarrow')
df.head(10)
```

[63]:

0	Id	Subsegmento	Sexo	Region	Edad	Renta	Antiguedad	Internauta	\
0	1	160	M	13.0	43	NaN	130	1	
1	2	160	H	13.0	46	143640.0	69	1	
2	3	170	H	13.0	45	929106.0	24	1	
3	4	151	H	13.0	46	172447.0	134	0	
4	5	170	H	13.0	46	805250.0	116	0	
5	6	170	H	13.0	47	707664.0	67	1	
6	7	811	H	13.0	48	1022833.0	21	1	
7	8	170	H	13.0	46	NaN	69	0	
8	9	170	H	13.0	49	1171066.0	33	0	
9	10	170	M	13.0	44	964387.0	23	1	

0	Adicional	Dualidad	…	PagoNac_T01	PagoInt_T01	EeccNac_T01	\
0	1	0	…	33000	0.0	1099866.0	
1	0	0	…	300000	0.0	214592.0	
2	1	0	…	216676	0.0	0.0	
3	1	0	…	60000	0.0	272762.0	
4	1	1	…	272925	0.0	249562.0	
5	1	0	…	35800	0.0	35800.0	
6	0	1	…	9391	0.0	8818.0	
7	1	1	…	6000	0.0	283520.0	
8	0	0	…	60000	0.0	507629.0	
9	1	0	…	92583	0.0	65487.0	

0	EeccInt_T01	UsoL1_T01	UsoL2_T01	UsoLI_T01	IndRev_T01	target	nan
0	0.0	1099866.0	15080	0.0	R	0	NaN
1	0.0	214592.0	83596	0.0	R	0	NaN
2	0.0	7400.0	0	0.0	T	0	NaN
3	0.0	272762.0	10591	0.0	R	0	NaN
4	0.0	75339.0	377782	0.0	R	0	NaN
5	0.0	0.0	51197	0.0	R	0	NaN
6	0.0	8818.0	0	0.0	T	0	NaN
7	0.0	283520.0	0	0.0	R	0	NaN
8	0.0	507629.0	0	0.0	R	1	NaN
9	0.0	65487.0	12084	0.0	R	0	NaN

```
[10 rows x 575 columns]
```

3.0.3 Como podemos ver en el head() anterior, tenemos la última columna repleta de valores NaN, por lo que vamos a borrar esa columna por completo.

[64]:
```
df.drop(df.columns[-1], axis=1, inplace=True)
df.head(5)
```

[64]:

0	Id	Subsegmento	Sexo	Region	Edad	Renta	Antiguedad	Internauta	\
0	1	160	M	13.0	43	NaN	130	1	
1	2	160	H	13.0	46	143640.0	69	1	
2	3	170	H	13.0	45	929106.0	24	1	
3	4	151	H	13.0	46	172447.0	134	0	
4	5	170	H	13.0	46	805250.0	116	0	

0	Adicional	Dualidad	…	ColMx_T01	PagoNac_T01	PagoInt_T01	EeccNac_T01	\
0	1	0	…	0.0	33000	0.0	1099866.0	
1	0	0	…	0.0	300000	0.0	214592.0	
2	1	0	…	0.0	216676	0.0	0.0	
3	1	0	…	0.0	60000	0.0	272762.0	
4	1	1	…	0.0	272925	0.0	249562.0	

0	EeccInt_T01	UsoL1_T01	UsoL2_T01	UsoLI_T01	IndRev_T01	target
0	0.0	1099866.0	15080	0.0	R	0
1	0.0	214592.0	83596	0.0	R	0
2	0.0	7400.0	0	0.0	T	0
3	0.0	272762.0	10591	0.0	R	0
4	0.0	75339.0	377782	0.0	R	0

```
[5 rows x 574 columns]
```

3.0.4 Para poder proceder al análisis exploratorio del Dataframe, seleccionaremos las columnas más relevantes para encontrar respuesta a las preguntas expuestas en la primera fase.

3.0.5 Para esto, crearemos un Array el cual va a contener todos los nombres de las columnas que se utilizarán para el análisis, se establece un nuevo Dataframe con las columnas seleccionadas.

[65]:
```
# Creamos el Array y se insertan el nombre de las columnas seleccionadas
columnas_permitidas = ['Id', 'Edad', 'Renta', 'Region', 'Sexo', 'TC',␣
 ↪'Cuentas', 'Hipotecario', 'Consumo', 'Debito',
              'Ctacte', 'Antiguedad', 'Dualidad','FacCN_T01', 'FacCN_T02',␣
 ↪'FacCN_T03', 'FacCN_T04',
              'FacCN_T05', 'FacCN_T06', 'FacCN_T07', 'FacCN_T08', 'FacCN_T09',␣
 ↪'FacCN_T10', 'FacCN_T11',
```

```
            'FacCN_T12', 'FacCI_T01', 'FacCI_T02', 'FacCI_T03', 'FacCI_T04',␣
 ↪'FacCI_T05', 'FacCI_T06',
            'FacCI_T07', 'FacCI_T08', 'FacCI_T09', 'FacCI_T10', 'FacCI_T11',␣
 ↪'FacCI_T12', 'TxsCN_T01',
            'TxsCN_T02', 'TxsCN_T03', 'TxsCN_T04', 'TxsCN_T05', 'TxsCN_T06',␣
 ↪'TxsCN_T07', 'TxsCN_T08',
            'TxsCN_T09', 'TxsCN_T10', 'TxsCN_T11', 'TxsCN_T12', 'TxsCI_T01',␣
 ↪'TxsCI_T02', 'TxsCI_T03',
            'TxsCI_T04', 'TxsCI_T05', 'TxsCI_T06', 'TxsCI_T07', 'TxsCI_T08',␣
 ↪'TxsCI_T09', 'TxsCI_T10',
            'TxsCI_T11', 'TxsCI_T12', 'UsoL1_T01','UsoL1_T02', 'UsoL1_T03',␣
 ↪'UsoL1_T04', 'UsoL1_T05',
            'UsoL1_T06', 'UsoL1_T07', 'UsoL1_T08', 'UsoL1_T09', 'UsoL1_T10',␣
 ↪'UsoL1_T11', 'UsoL1_T12',
            'UsoLI_T01', 'UsoLI_T02', 'UsoLI_T03', 'UsoLI_T04', 'UsoLI_T05',␣
 ↪'UsoLI_T06', 'UsoLI_T07',
            'UsoLI_T08', 'UsoLI_T09', 'UsoLI_T10', 'UsoLI_T11', 'UsoLI_T12',␣
 ↪'CUPO_L1', 'CUPO_MX',
            'PagoNac_T01', 'PagoNac_T02', 'PagoNac_T03', 'PagoNac_T04',␣
 ↪'PagoNac_T05', 'PagoNac_T06',
            'PagoNac_T07', 'PagoNac_T08', 'PagoNac_T09', 'PagoNac_T10',␣
 ↪'PagoNac_T11', 'PagoNac_T12',
            'PagoInt_T01', 'PagoInt_T02', 'PagoInt_T03', 'PagoInt_T04',␣
 ↪'PagoInt_T05', 'PagoInt_T06',
            'PagoInt_T07', 'PagoInt_T08', 'PagoInt_T09', 'PagoInt_T10',␣
 ↪'PagoInt_T11', 'PagoInt_T12',
            'FlgAct_T01', 'FlgAct_T02', 'FlgAct_T03', 'FlgAct_T04',␣
 ↪'FlgAct_T05', 'FlgAct_T06', 'FlgAct_T07',
            'FlgAct_T08', 'FlgAct_T09', 'FlgAct_T10', 'FlgAct_T11',␣
 ↪'FlgAct_T12', 'FacAN_T01', 'FacAN_T02',
            'FacAN_T03', 'FacAN_T04', 'FacAN_T05', 'FacAN_T06', 'FacAN_T07',␣
 ↪'FacAN_T08', 'FacAN_T09',
            'FacAN_T10', 'FacAN_T11', 'FacAN_T12', 'FacAI_T01', 'FacAI_T02',␣
 ↪'FacAI_T03', 'FacAI_T04',
            'FacAI_T05', 'FacAI_T06', 'FacAI_T07', 'FacAI_T08', 'FacAI_T09',␣
 ↪'FacAI_T10', 'FacAI_T11',
            'FacAI_T12',␣
 ↪'target','IndRev_T12','IndRev_T11','IndRev_T10','IndRev_T09','IndRev_T08',
          ␣
 ↪'IndRev_T07','IndRev_T06','IndRev_T05','IndRev_T04','IndRev_T03','IndRev_T02','IndRev_T01']

# Se establece el nuevo nombre del Dataframe que contiene las columnas␣
 ↪seleccionadas
df_acotado = df[columnas_permitidas]
```

```
# Iniciamos con el primer paso de la exploración de los datos
df_acotado.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51124 entries, 0 to 51123
Columns: 160 entries, Id to IndRev_T01
dtypes: float64(127), int64(20), object(13)
memory usage: 62.4+ MB
```

3.0.6 En la celda ejecutada anteriormente, se aprecian todos los tipos de datos del Dataframe. Ahora revisamos cuáles son los valores únicos dentro de estos datos.

[66]:
```
for i in df_acotado:
    print(f"{i} = {df_acotado[i].unique()} \n")
```

```
Id = [    1     2     3 … 51122 51123 51124]

Edad = [ 43  46  45  47  48  49  44  38  36  33  51  37  50  41  39  35  42  40
  32  34  31  52  53  67  30  69  54  87  55  26  29  59  56  64  62  73
  60  27  28  63  58  78  57  25  61  72  83  86  80  93  79  82  81  84
  97  89  88  74  91  68  90  75  77  95  76  24  70  23  65  22  71  21
  20  19 104  66   9  85  94]

Renta = [    nan 143640. 929106. … 625376. 806220. 840878.]

Region = [13.  9. 10.  8.  7.  6.  5. 12. 11.  4.  1.  2.  3. nan]

Sexo = ['M' 'H' None]

TC = [ 3  1  2  4  5  6  7  8 12 10  9 11]

Cuentas = [1 2 3 4 5]

Hipotecario = [0 1]

Consumo = [0 1]

Debito = [1 0]

Ctacte = [1 0]

Antiguedad = [130  69  24 134 116  67  21  33  23  38  59  80  29  13   7  22
72  94
  43  18 184  63  49  14 109  11 160  31 105  27  78  60 152  10  36  28
  19  26  75  70  58  48  74  15  30 125  64   6  61 149   8  87  35 145
  16  47  20  39   9  25 154  84  73  55 108  66  92  50  65  34  32  17
  82  86  99  96  53  83 180 137 117  68 139  12 111  93 106 107  79  56
  88 133  81 101  41  57  45 188  44  71  37  52  97 119 148  54 155 113
```

```
  42 143 110 115  40 120  85  98  51 127 140 150 131  77 122  95 100 142
 156 151 114 112 121 118  62 126  90  46 138  76 128 141 136 123 132  89
 104 147 153 102 144 103 162  91 163 178 158 135 129 157 124 177 168 171
 165 146 159 247 185 229 191 161 250 176 175 311 217 190 173 249 238 201
 169 221 225 231 187 166 164 174 218 179 172 216 313 182 251 205 233 324
 230 263 210 197 243 215 183 256 248 242 186 227 254 245 253 195 246 226
 181 170 232 167 264 312 196 211 269 212 279 241 194 239 277 213 189]

Dualidad = [0 1]

FacCN_T01 = [     0 118247 191336 … 154913  62808 108982]

FacCN_T02 = [    0. 14293. 57929. … 69448. 44048. 24259.]

FacCN_T03 = [     0.   5678.   6650. … 195206.  40080. 275688.]

FacCN_T04 = [     0. 133940.  34458. … 106401.  96283.  24108.]

FacCN_T05 = [     0.  27990.  69822. … 192358.  54910.  93203.]

FacCN_T06 = [106045.      0.  59840. …   7229.  86550. 986252.]

FacCN_T07 = [115644.  63589. 215061. …  36983. 232226.  95750.]

FacCN_T08 = [ 67434. 231245. 667420. … 130147. 288598.  74595.]

FacCN_T09 = [ 26980.  98584.  55290. … 168756. 620952. 172086.]

FacCN_T10 = [ 14630. 100918.   6500. … 116272.  99645. 165990.]

FacCN_T11 = [     0. 291725.  97474. …  89460. 235730.  29745.]

FacCN_T12 = [ 55490.  19813. 123950. …  57185. 223290.  78520.]

FacCI_T01 = [     0  13651  92295 … 153786 131132 211849]

FacCI_T02 = [     0. 143374.  81043. …  21560. 173739. 625311.]

FacCI_T03 = [     0.      68583.6496  20445.4332 … 131485.3768  94400.028
  25046.8416]

FacCI_T04 = [     0.  34520.  62976. … 113267. 106148.  10890.]

FacCI_T05 = [     0.  10774. 195165. … 133969.  94064. 122401.]

FacCI_T06 = [     0.     195714.1682  73135.897  …  10385.679  203810.0912
   8221.3144]
```

```
FacCI_T07 = [     0. 102577. 349247. … 282419.  57121. 203888.]

FacCI_T08 = [     0.     nan 139408. …  76189.  44588. 224135.]

FacCI_T09 = [     0.     nan 384773. …  55518.   3666.  73991.]

FacCI_T10 = [     0.     187225.2092         nan …  69624.1392 139619.6502
 202968.1442]

FacCI_T11 = [     0.             nan 263571.8324 … 191499.897   10561.8028
  72749.5256]

FacCI_T12 = [     0.             nan  17493.0663 … 375758.4001  30940.5576
  33292.3852]

TxsCN_T01 = [ 0  1  3 10  2 15 13  4  6  5  8  9 11 21 17 25  7 12 14 24 19 28
26 16
 18 38 23 33 36 43 27 -1 32 22 20 42 29 34 31 30 37 92 44 -2 74 53 51 41
 39 45 35]

TxsCN_T02 = [ 0.  1.  5.  9.  2.  3. 17.  4.  8. 10. 12.  6.  7. 27. 11. 14. 15.
19.
 16. 20. 13. 23. 21. 26. 38. 43. 24. 22. 18. 45. 29. 25. 30. 34. 31. 42.
 33. 44. nan 28. -1. 35. 36. 94. 39. 32. 53. 66. 46. 47. -2. 40. 55.]

TxsCN_T03 = [ 0.  1.  2.  8. 13.  5.  3.  4. 17.  7. 11. 15. 19. 20. 12.  6. 27.
9.
 14. 18. 22. 26. 31. 25. 16. 10. 24. 32. 41. 23. 21. 47. nan 30. 29. 35.
 36. 28. 38. 33. 34. 40. 42. 37. 45. -1. 46. 43. 39. -2.]

TxsCN_T04 = [ 0.  7.  2.  3. 14.  1.  5. 16.  4. 11.  9. 17.  6. 12. 24. 19. 18.
8.
 13. 10. 23. 28. 22. 15. 25. 21. 39. 32. 36. 30. 20. 26. 29. nan 33. 27.
 43. 34. 31. 46. 44. 38. 37. -1. 50. 42. 48. 35. 45.]

TxsCN_T05 = [ 0.  1.  3.  2. 10. 22.  8.  4. 17.  5.  6. 14. 18. 25.  9. 11.  7.
19.
 23. 12. 40. 15. 13. 16. 42. 20. 27. -1. 21. 38. 28. 31. 30. 29. 58. 26.
 nan 24. 32. 43. 37. 50. 36. 41. 34. 33. 46. 35. 39. 44.]

TxsCN_T06 = [ 5.  0.  4.  6. 10.  2. 25.  3.  1. 17.  8. nan 19. 11.  7. 14. 30.
12.
  9. 16. 13. 21. 15. 22. 24. 18. 23. 42. 29. 28. 37. 26. 20. 27. -1. 40.
 65. 35. 54. 31. 33. -3. 38. 41. 32. 36. 45. 39. 53. 44. 48.]

TxsCN_T07 = [ 6.  3. 10.  0.  7.  8.  4.  1.  2. 12.  5.  9. nan 14. 15. 23. 16.
20.
 11. 17. 18. 32. 19. 29. 26. 13. 25. 28. 21. 39. 22. 38. 24. 30. 33. 27.
```

```
 36. -1. 37. 48. 34. 31. 35. 54. 45. 50. 51. 43. 41.]

TxsCN_T08 = [ 5. 10.  3. 16.  4.  2.  0.  1. nan  6.  8. 11.  9.  7. 26. 13. 12.
17.
 14. 19. 18. 15. 21. 22. -1. 28. 23. 30. 20. 37. 36. 29. 42. 27. 34. 31.
 25. 49. 38. 24. 33. 47. 35. 41. 44. 39. 48. 32. 45.]

TxsCN_T09 = [ 2.  5.  4.  1.  8.  0.  3. nan 12.  6.  9. 11.  7. 13. 25. 14. 10.
20.
 16. 21. 37. 22. 36. 17. 19. 24. 23. 31. 26. 15. 18. 34. -1. 29. 28. 32.
 30. 27. 33. 53. 35. 42. -2. 41. 44. 38. 39. 47. 46. 43. 45.]

TxsCN_T10 = [ 2.  5.  1.  8.  0. 16.  3. nan  9.  6.  7. 19. 14.  4. 24. 10. 20.
11.
 15. 12. 18. 13. 21. 17. 23. 28. 41. 22. 32. 37. 27. 26. 36. -1. 45. 33.
 25. 31. 30. 40. 46. 34. 39. 29. 35. -2. 44.]

TxsCN_T11 = [ 0.  8.  4. 12.  1.  3. nan  2.  5.  6.  9. 11. 13. 17. 14.  7. 10.
15.
 20. 23. 18. 24. 16. 27. 31. 21. 22. 19. 25. 26. 30. 35. 38. 29. 36. 47.
 -1. 45. 32. 28. 34. -2. 33. 44. 41. 55. 52. 50.]

TxsCN_T12 = [ 3.  1.  6.  2. 25.  0.  4. nan  8.  5.  7.  9. 16. 14. 21. 11. 13.
10.
 15. 18. 12. 17. 19. 33. 20. 39. 23. 24. 22. 32. 26. 31. 30. 27. 28. -1.
 42. 35. 36. 29. 40. 41. 34. 37. 43. 56. -2. 38.]

TxsCI_T01 = [ 0  1  2  3  4 11 19  6  8  5  7  9 13 10 12 21 26 16 31 14 15 18
55 17
 20 24 28 29 37 22 48]

TxsCI_T02 = [ 0.  6.  3.  1.  2.  4.  5. 10.  8. 18. 19.  9. 16.  7. 11. 21. 12.
15.
 13. nan 22. 48. 25. 17. 14. -1. 24. 20. 28. 35. 23. 32. 36. 86.]

TxsCI_T03 = [ 0.  1.  7.  2.  4.  3.  9. 13.  5.  6. 12. 23.  8. 10. 14. nan 25.
32.
 15. 16. 17. 21. 44. 26. 28. 24. 11. 20. 19. 30. 34. 18. 90.]

TxsCI_T04 = [  0.   2.   1.   9.   4.   3.   6.  16.   8.  29.   7.  17.  11.
5.
  12.  nan  24.  10.  14.  22.  25.  58.  20.  52.  15.  13.  18.  30.
  19.  21.  26. 100.  23.]

TxsCI_T05 = [ 0.  1.  4.  2.  5.  8.  3.  7.  6. 21. 14.  9. 11. 13. 22. 16. 10.
28.
 23. 18. 15. 12. 19. nan 17. 24. 30. 20. 29.]
```

```
TxsCI_T06 = [ 0.  7.  1. nan  2.  6.  4. 11.  8. 14.  9.  3. 24. 10.  5. 12. 15.
20.
 17. 16. 18. 13. 28. 23. 32. 35. 33. 22. 53. 25. 29. 21. 27. 19.]

TxsCI_T07 = [ 0.  4.  2.  9.  1. nan  3. 10.  7.  5.  8.  6. 12. 19. 22. 13. 11.
17.
 -1. 16. 15. 23. 14. 18. 32. 33.]

TxsCI_T08 = [ 0. nan  3.  1. 10.  4.  2.  5.  8.  7. 20. 15.  9. 16.  6. 14. 11.
23.
 21. 29. 13. 36. 17. 22. 28. 12. 60. 25. 39. 18. 19. 32.]

TxsCI_T09 = [ 0. nan 12.  1.  2.  7.  4.  3.  5. 11.  6.  9.  8. 14. 15. 10. 17.
28.
 16. 13. 18. 23. 22. 27. 21. 34. 48. 25. 20. 29.]

TxsCI_T10 = [ 0.  6. nan  1.  2.  3.  7.  4. 15. 21.  5. 11. 10. 14. 13. 12.  9.
8.
 16. 17. 20. 18. 29. 25. 19. 22. 34. 27. 28.]

TxsCI_T11 = [ 0. nan  7.  1.  4.  3. 19.  2.  5. 22. 11. 15.  6. 10. 12.  9.  8.
14.
 16. 18. 13. 37. 21. 42. 17. 23. 27. 20. 28. 32. 24.]

TxsCI_T12 = [ 0. nan  1.  4.  5.  3.  2. 12.  8. 19.  6.  7. 10. 31. 11. 13. 14.
9.
 17. 25. 16. 28. 23. 15. 24. 27. 18. 35. 21.]

UsoL1_T01 = [1099866.  214592.    7400. …  478320.   24638.   18500.]

UsoL1_T02 = [1072040.    462736.     32740.   …   18891.     26528.
11664.84]

UsoL1_T03 = [1051162.  454584.       0. …   52601.  658814.   25460.]

UsoL1_T04 = [1037828.  422350.   54138. … 1934873.  259831.  703455.]

UsoL1_T05 = [982806. 441843.      0. …  51744. 730967.  18959.]

UsoL1_T06 = [944115.   507253.        0.   … 640992.    13123.    15001.07]

UsoL1_T07 = [878272. 499198.  63991. … 674735.  34078.  13092.]

UsoL1_T08 = [ 842571.  544933.   23800. … 1769378.  143715.  627109.]

UsoL1_T09 = [807655. 569718.   5700. …  51745. 612620.  47510.]

UsoL1_T10 = [769194.   426159.     6500.   … 110298.    24500.     3962.74]
```

```
UsoL1_T11 = [739270. 356576.  14850. … 363771. 543642.  95358.]

UsoL1_T12 = [731768. 244876.  94415. … 549787. 103545.  73300.]

UsoLI_T01 = [   0.    271.79   25.88 …  291.56 -250.33  401.64]

UsoLI_T02 = [ 0.0000e+00  2.7179e+02 -3.2000e-01 … -4.2400e+00  5.4670e+01
  7.3672e+02]

UsoLI_T03 = [  0.   130.12  38.79 …  53.56 249.   273.52]

UsoLI_T04 = [ 0.   63.5   4.76 … 53.56 34.8  76.72]

UsoLI_T05 = [  0.   272.78 133.65 … 251.85 174.17 226.64]

UsoLI_T06 = [  0.   358.99 133.65 … 489.86 368.96  15.08]

UsoLI_T07 = [  0.   659.84 270.68 … 203.64 385.21  -4.88]

UsoLI_T08 = [  0.      nan 436.92 … 105.55 426.12  -4.88]

UsoLI_T09 = [  0.    34.47    nan …   6.97  -4.88 140.67]

UsoLI_T10 = [  0.   347.86    nan …  -4.24  51.35  -4.88]

UsoLI_T11 = [  0.      nan 490.12 …  53.3  356.1   72.12]

UsoLI_T12 = [  0.      nan  -0.61 … 186.5   52.48  61.72]

CUPO_L1 = [ 798000  750000 1350000 … 2524600 2584000 2735424]

CUPO_MX = [1210. 1000. 1500. … 3029.  673. 1526.]

PagoNac_T01 = [ 33000 300000 216676 …  18891  26528  12360]

PagoNac_T02 = [ 33000.  14000.  25189. … 263101. 173162.  14700.]

PagoNac_T03 = [ 41000.      0.  60000. …  73455. 106618. 169661.]

PagoNac_T04 = [ 39000. 200000.  54138. …  76775.  17283.  18959.]

PagoNac_T05 = [ 50000. 200000.  69822. … 159171.  13123.  18506.]

PagoNac_T06 = [ 36000. 100000. 124289. …  13092.  46256.  19990.]

PagoNac_T07 = [ 26000. 200000.  60886. … 647901. 103489.  42031.]
```

```
PagoNac_T08 = [ 25000. 180000.      0. …  10336.  47510.   6475.]

PagoNac_T09 = [ 24000. 221000.  45890. …  53110.  45711. 110298.]

PagoNac_T10 = [ 23000. 194000.  14850. …  87023.  51745.  35454.]

PagoNac_T11 = [     0. 150000. 178179. … 160310.  37294.  73757.]

PagoNac_T12 = [ 22000. 250000.  29990. … 140316. 142588.  16358.]

PagoInt_T01 = [0.00000000e+00 8.17563000e+04 9.75801000e+04 2.21533200e+05
 2.10984000e+04 5.52778080e+05 6.50094450e+04 4.05616740e+06
 4.48341000e+04 1.35029760e+05 4.16693400e+04 2.37357000e+05
 3.53398200e+04 3.27489365e+05 1.25008020e+05 1.18678500e+05
 5.80206000e+05 3.00652200e+04 4.32517200e+05 1.31865000e+04
 1.58238000e+04 1.84083540e+05 1.68787200e+04 5.09526360e+05
 1.05492000e+05 9.26852712e+04 8.96682000e+04 6.36865753e+05
 4.28297520e+05 6.43501200e+05 5.27460000e+05 1.42414200e+04
 2.54235720e+05 2.71905630e+04 6.75148800e+04 1.71424500e+05
 1.57183080e+05 2.05181940e+05 1.61930220e+05 4.16693400e+05
 3.89265480e+04 4.49923380e+05 3.56035500e+05 1.96953564e+04
 3.28175063e+05 5.90681356e+05 2.58455400e+04 5.27460000e+03
 5.06387973e+05 6.09216300e+05 2.10984000e+05 5.90333232e+04
 2.69004600e+04 4.04762255e+05 2.71641900e+05 4.66907592e+05
 6.54050400e+05 5.79678540e+04 8.86132800e+05 1.58238000e+05
 3.97704840e+05 2.90103000e+04 4.21968000e+06 7.73520090e+04
 2.87465700e+05 1.04964540e+05 1.84611000e+05 3.95595000e+04
 2.63730000e+05 7.99101900e+04 1.12438648e+05 1.05492000e+03
 2.63730000e+04 4.79988600e+04 3.74496600e+04 2.25225420e+05
 2.91157920e+05 1.31865000e+05 3.61310100e+05 1.79336400e+04
 1.75027052e+05 3.62528533e+05 1.33974840e+05 5.27238467e+05
 1.37139600e+05 2.92086250e+05 1.70897040e+05 9.59977200e+04
 1.26590400e+05 3.16476000e+05 1.63512600e+05 8.63979480e+05
 9.44680860e+05 3.46435728e+04 1.42414200e+05 7.91190000e+04
 8.43936000e+04 2.47906200e+05 1.41359280e+05 6.43501200e+04
 4.74714000e+04 2.00434800e+04 3.42849000e+04 6.17128200e+04
 1.97581241e+05 2.52938168e+05 2.34455970e+04 1.60875300e+05
 5.48558400e+04 7.22620200e+04 3.69222000e+03 2.74279200e+04
 6.45716532e+04 6.11853600e+04 3.00652200e+05 1.22528958e+06
 8.01739200e+04 5.16910800e+04 3.37574400e+04 1.40304360e+05
 7.54267800e+04 1.31601270e+04 7.64817000e+04 3.77661360e+05
 5.11636200e+04 5.95502340e+05 1.99379880e+04 6.75396706e+05
 9.27802140e+05 2.69004600e+05 2.39466840e+06 7.17345600e+04
 9.53172966e+04 2.63730000e+03 1.24480560e+06 1.41886740e+05
 1.44524040e+05 3.88843512e+04 2.50543500e+05 6.03308748e+04
 8.75636346e+04 6.72511500e+04 1.95840623e+05 5.27460000e+04
 1.05492000e+06 2.80081260e+05 1.66979067e+06 5.53833000e+04
 1.78808940e+05 1.08656760e+05 2.17076163e+05 7.91190000e+03
```

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 1.10239140e+05 3.07983894e+04 1.05492000e+04 5.28514920e+05
 1.39249440e+05 2.65312380e+05 3.83463420e+05 2.44213980e+05
 6.06579000e+04 1.27117860e+05 1.31337540e+05 3.69222000e+05
 2.55818100e+05 3.27473541e+05 3.01707120e+05 8.67829938e+04
 2.16258600e+04 8.96682000e+05 2.82191100e+05 1.56381341e+05
 4.27242600e+04 2.10984000e+06 1.79072670e+04 8.28112200e+04
 6.85698000e+04 6.10271220e+05 8.54485200e+04 3.10146480e+05
 1.56655620e+05 4.21968000e+03 1.77226560e+05 1.11895364e+05
 6.32952000e+04 1.91853026e+05 8.96154540e+05 5.01087000e+04
 2.84828400e+05 1.66149900e+05 8.13549029e+05 2.30500020e+05
 3.16581492e+04 5.79019215e+05 3.82408500e+04 9.17780400e+04
 4.21968000e+05 1.57710540e+05 1.52963400e+04 1.30546350e+04
 1.45522522e+06 2.86621764e+04 9.38878800e+04 2.36365375e+05
 4.54311847e+05 2.75861580e+05 1.66677360e+05 2.05709400e+04
 1.00217400e+04 2.98014900e+05 1.43189566e+05 1.80918780e+05
 4.21968000e+04 3.15763929e+05 2.97487440e+05 7.80640800e+04
 2.21533200e+04 1.26062940e+05 1.73534340e+05 5.12163660e+05
 5.43283800e+04 3.04455187e+05 2.72696820e+05 2.66894760e+05
 7.72043202e+04 1.52963400e+05 8.16244350e+04 1.61402760e+05
 5.80206000e+03 1.20788340e+05 7.38444000e+03 2.58982860e+05
 2.60280412e+05 1.77099970e+05 1.47161340e+05 4.12473720e+05
 1.25451086e+05 6.90972600e+05 2.32082400e+05 4.14056100e+04
 1.97797500e+05 3.29662500e+05 1.88345417e+05 8.80858200e+04
 1.16568660e+05 1.04437080e+05 5.59107600e+04 9.24215412e+04
 5.80206000e+04 1.00744860e+05 4.57835280e+05 2.72169360e+05
 5.38009200e+04 2.79553800e+04 1.67732280e+05 1.89516378e+04
 2.96801742e+05 4.74714000e+05 1.08656760e+06 4.32517200e+04
 7.90135080e+03 4.85263200e+04 6.85487016e+04 2.58608363e+05
 2.20478280e+05 1.87401263e+05 6.59852460e+05 2.83984464e+04
 3.16212270e+04 5.24822700e+03 7.18759193e+05 1.84611000e+06
 3.90320400e+05 4.11313308e+04 6.26242709e+05 3.91902780e+05
 3.62270077e+05 1.18520262e+06 2.66314554e+04 1.53063617e+05
 2.63730000e+06 8.97736920e+05 6.27677400e+04 9.44153400e+04
 1.50326100e+05]

PagoInt_T02 = [0.00000000e+00 5.27520000e+04 1.78805542e+06 2.63760000e+05
 4.28610000e+04 1.05504000e+04 1.93125072e+06 1.11306720e+05
 1.31880000e+04 6.60455040e+05 2.37573907e+05 1.84632000e+04
 7.91280000e+04 7.09514400e+03 1.89907200e+04 1.29295152e+04
 1.11834240e+05 1.08669120e+05 2.53156848e+04 5.29577328e+04
 1.54035840e+05 6.33024000e+04 6.10731005e+05 7.38528000e+04
 2.31881966e+05 7.38528000e+03 4.27291200e+04 4.84738128e+04
 2.11008000e+04 1.64586240e+05 2.37911520e+05 1.06242528e+06
 1.01786567e+06 1.87005840e+06 5.01144000e+04 1.50870720e+04
 2.26833600e+04 5.96097600e+05 3.95640000e+04 1.74081600e+04
 9.49536000e+04 4.82849606e+05 3.33313512e+05 5.88184800e+05
 2.94883680e+05 4.11465600e+04 2.63760000e+04 4.22016000e+04
 5.80272000e+04 4.48392000e+04 1.58256000e+05 5.53896000e+04
```

1.01283840e+06 7.12152000e+04 8.44032000e+03 2.61122400e+05
5.85547200e+04 2.38966560e+05 3.05961600e+05 1.31880000e+05
6.33024000e+05 2.06471328e+04 7.96555200e+04 8.96784000e+05
5.96097600e+04 nan 1.05504000e+05 4.37841600e+04
5.16969600e+05 1.38210240e+05 7.91280000e+03 1.06559040e+05
2.37384000e+04 1.06031520e+05 2.74310400e+05 2.74310400e+04
2.27888640e+05 4.16740800e+04 2.69035200e+05 3.16512000e+03
2.32108800e+04 2.28416160e+05 2.90136000e+05 2.06260320e+05
1.08141600e+05 4.73185440e+05 2.49516960e+05 1.06981056e+06
1.13416800e+05 3.44839824e+04 2.69035200e+04 7.86004800e+04
2.64815040e+05 1.90962240e+05 4.85318400e+04 1.58256000e+04
5.48620800e+04 3.42888000e+04 9.28224192e+04 1.48322798e+05
4.64217600e+04 1.23044040e+05 1.37155200e+04 1.16054400e+04
1.43485440e+05 1.17109440e+05 2.63707248e+04 9.44260800e+05
8.07105600e+04 1.22542896e+06 1.63531200e+05 5.11694400e+04
3.38140320e+05 5.35960320e+05 1.36627680e+05 3.37612800e+04
5.50741430e+05 2.62177440e+05 3.08071680e+05 1.59838560e+06
2.20503360e+05 7.27977600e+04 2.00457600e+05 2.98576320e+05
3.90364800e+05 2.55847200e+05 2.70090240e+05 4.03552800e+05
2.46351840e+05 8.59857600e+04 3.60032400e+04 4.13417424e+04
1.31880000e+06 4.00915200e+05 7.54353600e+04 1.01389344e+05
1.00228800e+04 2.59655894e+05 6.85776000e+04 2.00457600e+04
4.61685504e+06 1.85687040e+05 8.88871200e+03 3.63988800e+04
9.65361600e+04 2.10396077e+05 2.42659200e+04 5.90822400e+04
1.47309960e+05 3.05750592e+04 6.43574400e+03 3.69264000e+04
1.52453280e+05 1.07086560e+05 5.89978368e+04 1.25549760e+05
2.26833600e+05 8.03149200e+04 9.21999456e+05 4.27328126e+05
7.12152000e+05 7.06876800e+04 8.67770400e+05 9.49536000e+03
2.06313072e+04 1.10779200e+05 3.16512000e+04 3.02796480e+05
6.77282928e+04 1.79356800e+06 9.60086400e+04 6.59400000e+04
1.99402560e+05 3.00686400e+05 4.40479200e+04 2.63760000e+03
5.45983200e+05 4.43116800e+04 3.11236800e+05 6.43574400e+04
2.91718560e+05 2.69193456e+04 5.80694016e+04 1.65113760e+05
4.53667200e+04 4.22016000e+03 7.43803200e+04 7.59101280e+05
1.23967200e+05 4.74768000e+04 1.80860232e+05 1.97503488e+04
9.91737600e+04 1.68806400e+05 2.89608480e+05 7.64904000e+04
1.26604800e+04 4.55249760e+05 3.40777920e+05 1.15442477e+05
1.21329600e+05 2.45402304e+06 6.27748800e+04 1.02866400e+05
5.27520000e+03 2.83278240e+05 7.08564864e+04 3.04590048e+04
7.91280000e+05 1.04870976e+06 7.22702400e+04 7.78355760e+04
1.95182400e+02 8.65132800e+04 4.60155696e+04 1.99803475e+05
2.05732800e+05 7.75454400e+04 6.64200432e+04 2.67452640e+05
2.14700640e+05 1.67292418e+05 7.63004928e+04 1.34517600e+05
3.01108416e+04 5.95042560e+05 2.03622720e+06 4.69492800e+04
3.58713600e+04 4.06190400e+04 3.13188624e+04 4.86742704e+04
2.84860800e+04 3.79814400e+05 3.91351262e+05 6.07281024e+04
6.85776000e+05 2.11008000e+05 4.42642032e+04 1.81466880e+05
6.54124800e+04 1.34728608e+06 1.95182400e+05 2.10955248e+04

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 1.52980800e+05 3.74117184e+04 6.38299200e+04 1.95182400e+04
 8.01830400e+04 1.26868560e+06 6.06648000e+04 2.55319680e+05
 2.47934400e+04 1.11544104e+05 1.29474509e+05 2.01512640e+05
 5.22244800e+04 3.27062400e+04 8.44032000e+04 4.74768000e+05
 7.49078400e+04 2.75502595e+05 5.74996800e+04 1.72551792e+04
 1.78328136e+05 4.81625760e+05 5.43345600e+04 5.70882144e+04
 1.78897858e+05 9.17884800e+04 2.13118080e+05 4.68437760e+05
 1.59838560e+05 1.40320320e+05 1.72499040e+05 1.74081600e+05
 2.71672800e+05 8.44032000e+05 4.22016000e+05 3.24424800e+05
 1.18692000e+05 8.58960816e+04 7.90224960e+03 2.17338240e+05
 3.39195360e+05 5.36487840e+05 6.91051200e+04 1.81994400e+06
 2.20039142e+05 1.09196640e+05 1.32935040e+05 1.55090880e+05
 4.12520640e+05 2.03095200e+05 3.00686400e+04 5.27520000e+05
 3.74539200e+04 9.23160000e+04 5.77634400e+05 9.44260800e+04]

PagoInt_T03 = [0.00000000e+00 6.18264840e+05 1.06470160e+05 3.46291560e+05
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 5.58704800e+04 5.27080000e+04 5.15167992e+04 5.27080000e+05
 2.24009000e+05 3.21518800e+04 3.53723388e+04 2.46146360e+05
 7.37912000e+04 3.58414400e+04 5.79788000e+04 1.12257498e+05
 8.22244800e+04 2.63540000e+05 2.63540000e+04 3.40019308e+04
 4.40559818e+05 5.69773480e+05 3.88985040e+05 2.52998400e+05
            nan 1.14903440e+05 1.95019600e+05 4.83859440e+03
 3.05706400e+05 2.89894000e+04 1.05416000e+05 3.92674600e+04
 6.74662400e+04 1.58124000e+05 3.53828804e+04 1.31770000e+04
 4.49599240e+05 1.15957600e+04 4.21664000e+04 2.27698560e+05
 6.02979520e+05 1.06470160e+06 3.97418320e+05 9.11848400e+04
 1.24390880e+05 1.10686800e+04 2.79531607e+05 1.11477420e+06
 6.06827204e+04 8.59140400e+04 2.12149700e+04 6.32496000e+04
 2.68810800e+04 1.17538840e+05 4.37476400e+04 4.16709448e+04
 1.41310148e+04 3.88457960e+05 8.01161600e+04 1.38622040e+05
 2.23481920e+05 5.32350800e+04 2.60904600e+05 2.35736530e+05
 3.59468560e+05 2.66175400e+05 6.64120800e+04 7.64213292e+04
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 2.73818060e+04 8.01219579e+05 2.21320892e+04 9.01306800e+04
 7.80078400e+04 2.07669520e+05 3.47872800e+04 1.33878320e+05
 4.97563520e+04 3.16248000e+04 2.21526453e+05 9.48744000e+05
 3.98999560e+05 2.11359080e+06 1.12268040e+05 1.95019600e+04
 2.74081600e+05 2.43510960e+05 7.43182800e+04 1.96073760e+05
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 3.23400476e+05 2.70919120e+05 8.27515600e+04 7.95890800e+04
 6.53579200e+04 2.65648320e+05 5.16538400e+04 5.44473640e+05
 1.26499200e+05 1.43154928e+04 1.17011760e+05 1.16484680e+05
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 1.09105560e+05 6.85204000e+04 4.21664000e+05 1.46528240e+05
 6.29944933e+05 1.21228400e+04 2.37713080e+05 3.42602000e+05
 1.10686800e+05 2.83410916e+04 2.67809348e+04 4.05582789e+05
 4.51127772e+04 5.21282120e+05 1.47582400e+04 5.37621600e+04
 1.58097646e+05 1.69192680e+05 1.68560184e+04 1.44947000e+05
 3.16248000e+05 7.78866116e+04 1.42311600e+04 1.26868156e+04
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 8.06432400e+04 4.40507110e+05 5.27080000e+02 2.97088642e+05
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 3.37858280e+05 8.19609400e+05 2.97800200e+05 5.24444600e+03
 9.42577164e+04 5.10071128e+05 2.41244516e+06 2.79352400e+04
 7.80289232e+04 1.63394800e+04 6.27752280e+05 5.59758960e+04
 4.56978360e+05 2.12940320e+05 1.80788440e+05]

PagoInt_T04 = [0.00000000e+00 5.17795200e+04 9.75990015e+04 2.89722595e+05
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 5.39370000e+04 1.28186674e+05 4.09921200e+04 2.69685000e+04
 1.81983438e+04 6.96866040e+05 1.07334630e+05 8.88018768e+05
 1.17852345e+04 3.31658613e+04 1.07874000e+04 2.13051150e+05
 2.42716500e+04 1.67204700e+04 4.84791150e+05 4.45195998e+05
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 6.98214465e+04 2.34086580e+05 2.15748000e+05 2.81011770e+05
 8.46810900e+04 2.33007840e+05 4.58464500e+04 1.43008562e+05
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5.39370000e+05 1.72096786e+05 1.07874000e+05 6.93252261e+04
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PagoInt_T05 = [0.00000000e+00 2.92717940e+05 2.16028000e+05 3.20261510e+05
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 8.64112000e+04 9.75366420e+03 3.51423549e+04 7.40976040e+05
 9.39721800e+05 3.24042000e+05 1.40418200e+04 2.03276947e+05
 4.48798170e+05 2.43031500e+04 4.10453200e+04 2.16109011e+05
 1.83623800e+04            nan 5.40070000e+05 1.75522750e+05
 1.08014000e+04 7.56098000e+03 1.94965270e+05 4.21254600e+04
 2.32230100e+04 8.34030101e+04 2.41951360e+05 1.78223100e+05
 2.21428700e+05 5.29268600e+04 2.48432200e+04 3.79966248e+05
 2.43031500e+05 2.75435700e+04 6.73629311e+04 2.16028000e+03
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 3.28902630e+05 1.24216100e+05 9.61324600e+04 1.64235287e+06
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 1.40418200e+05 3.83449700e+04 1.12431773e+05 1.99825900e+04
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PagoInt_T06 = [0.00000000e+00 3.59818800e+05 1.47743780e+05            nan
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8.12318200e+04 9.93754104e+04 8.88643400e+05 2.35648603e+05
2.17690374e+05 2.72590000e+04 7.63252000e+04 2.18072000e+05
1.23210680e+05 1.14487800e+05 1.36295000e+05 2.83493600e+04
1.47198600e+05 5.45180000e+03 3.62135815e+05 4.90662000e+04
7.05408402e+04 2.99849000e+04 1.09036000e+06 1.31421091e+05
4.04850668e+04 6.85836440e+03 1.58102200e+04 3.23400776e+04
1.69005800e+04 2.23698258e+07 8.72288000e+04 8.88643400e+04
8.72833180e+05 3.52186280e+05 4.57951200e+04 3.82716360e+05
3.24382100e+05 8.17770000e+04 5.45180000e+04 1.94084080e+05
1.09036000e+05 5.85741392e+04 2.23523800e+04 3.18314247e+05
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9.81324000e+03 8.55932600e+04 9.70420400e+04 5.99698000e+04
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2.50782800e+05 1.41479662e+05 1.97900340e+05 9.54065000e+04
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1.86451560e+05 2.37153300e+05 1.52650400e+04 3.54367000e+04
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8.17770000e+03 6.37860600e+04 2.22111784e+05 7.35993000e+04
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8.94095200e+04 1.32920336e+05 5.01565600e+04 7.74700780e+05
9.75872200e+04 3.91052162e+05 9.97352292e+04 1.59737740e+06
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1.65734720e+05 3.87077800e+04 4.97204160e+05 1.48834140e+05
3.21656200e+04 4.25240400e+05 3.92529600e+04 2.25104822e+07
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2.03199490e+05 1.67370260e+05 2.61304774e+04 8.48300080e+04
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1.93102756e+07 5.17921000e+04 2.60050860e+05 4.03569495e+05
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4.36089482e+04 2.42605100e+05 4.18534686e+04 1.07400460e+05
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1.96264800e+04 4.90662000e+03 4.68854800e+04 6.65119600e+04
1.14487800e+04 3.18657710e+05 3.50577999e+05 6.05149800e+04

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 8.87160510e+05 2.28975600e+04 3.05518872e+05 1.56025064e+05
 1.06364618e+06 2.54053880e+05 5.47360720e+05 1.33569100e+05
 2.04442500e+05 4.63403000e+05 6.21505200e+04 2.42059920e+05
 3.65270600e+04 1.70641340e+05 3.81626000e+05 2.22978620e+05
 1.25391400e+04 1.23101644e+05 1.65189540e+05 4.44866880e+05
 8.45029000e+04 7.62161640e+03 9.81324000e+05 1.10163977e+06
 1.67097670e+05 7.41444800e+04 1.59192560e+05 9.40435500e+04
 3.81626000e+04 1.63554000e+06 7.08734000e+03 1.41548900e+06
 1.53195580e+05 2.39879200e+05 6.34769429e+05 3.05300800e+04
 1.50469680e+05 1.73999649e+05 7.81482819e+05 3.65597708e+04
 1.85361200e+06 5.07017400e+04 3.38011600e+04 8.28673600e+04
 3.29288720e+05 1.25936580e+05 2.20252720e+05 7.67068260e+05
 3.52840496e+04 1.29327600e+05 4.22514500e+05 2.34427400e+04]

PagoInt_T07 = [0.00000000e+00            nan 1.92193200e+05 8.00805000e+04
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 3.52354200e+05 2.93094630e+05 1.64431960e+05 9.07579000e+04
 5.33870000e+04 3.99494921e+04 1.38806200e+05 3.03238160e+05
 7.90127600e+04 1.03036910e+05 5.33870000e+02 6.50787530e+05
 5.07133790e+05 2.38639890e+05 3.78193508e+04 8.80885500e+04
 2.23104273e+04 2.24225400e+05 3.20322000e+04 5.23192600e+04
 4.13514347e+05 1.27007673e+04 6.13096308e+04 3.61771667e+05
 4.05741200e+04 9.60966000e+04 5.87257000e+03 2.66935000e+04
 7.94932430e+05 1.36136850e+05 1.17451400e+04 2.51986640e+05
 3.73709000e+03 6.94031000e+05 4.69805600e+04 1.33467500e+05
 2.40241500e+04 1.53220690e+05 2.77612400e+05 7.63434100e+04
 8.08813050e+04 1.14248180e+05 2.26894750e+05 1.12112700e+05
 1.86854500e+05 8.00805000e+03 5.44547400e+05 1.73507750e+05
 1.06138695e+05 7.31401900e+04 2.56257600e+04 3.75444078e+05
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 4.64466900e+04 1.07841740e+05 1.54822300e+04 1.38806200e+04
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 6.09732927e+04 1.74575490e+05 9.87659500e+04 2.24225400e+04
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 6.71127977e+04 8.06143700e+04 3.25660700e+04 2.73341440e+05
 3.04759689e+05 1.66813020e+05 1.60161000e+04 1.12112700e+04
 3.52354200e+04 2.72273700e+04 2.61596300e+05 1.45901332e+05
 2.50918900e+05 1.60161000e+05 3.15517170e+05 1.22790100e+05
 1.67170713e+05 1.78846450e+04 6.24627900e+04 8.22159800e+04
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 5.30293071e+04 1.17451400e+05 7.04708400e+04 1.15315920e+05
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 6.84688275e+04 2.93628500e+04 2.01268990e+05 6.39576260e+05
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 1.31598955e+06 9.90862720e+04 2.64799520e+05 1.74628877e+04
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 9.60966000e+03 1.28128800e+05 4.58060460e+05 6.40644000e+03
 2.66668065e+04 2.08743170e+05 2.00201250e+05 3.61963860e+05
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 4.96605874e+04 1.78312580e+05 8.16554165e+04 1.25192515e+05
 1.07147709e+06 5.17853900e+04 4.16418600e+04 1.36670720e+05
 3.36338100e+04 1.48415860e+05 3.92928320e+05 8.86224200e+04
 7.95466300e+04 1.95396420e+06 2.02870600e+04 2.34902800e+05
 2.72273700e+05 1.84719020e+05 5.44921109e+04 1.06774000e+06
 1.26852851e+05 8.47518625e+04 1.62082932e+05 5.60563500e+05
 4.48450800e+05 5.16188226e+05 9.98336900e+04 1.41475550e+05
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 1.05706260e+05 1.81515800e+05]

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  155081.97     26464.5      59280.48     86803.56     66378.2589
   56634.03    136027.53    101094.39    387969.57    201130.2
   56454.0714    8997.93     10585.8     264645.      358107.0282
   10056.51     10818.6876   52929.      148201.2      62456.22
   38516.4333   93043.8891  110621.61     22759.47     45518.94
  175724.28    222301.8      56872.2105 1270296.       15878.7
   66161.25    206952.39    157776.0561  785466.36    168843.51
  793956.1716  344038.5       5954.5125  105408.1035   26993.79
  468421.65    574808.94     85549.1427   79922.79    143437.59
   34403.85      6632.0037   48165.39     68807.7      66690.54
   42279.6852  270996.48     17074.8954  158787.       55046.16
   88391.43    713117.7099  529290.       15582.2976   40226.04
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  211716.       23288.76    698662.8      43401.78    185251.5
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    2646.45     36521.01     55390.1985   95272.2      34234.4772
  528231.42    230294.079   207619.2954 1746657.     2212432.2
  428724.9     493827.57      9394.8975  175194.99    398026.08
  138144.69    397496.79    224948.25    793935.       69336.99
  195371.5248 1482012.       57300.9354  118031.67     83098.53
   39696.75    145025.46    125971.02    391949.8308   65203.2351
  217008.9      11453.8356  588570.48     63514.8     198483.75
  137805.9444  187897.95    275760.09     20113.02     22230.18
   96240.8007    5292.9     120519.333   126500.31    220184.64
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   28052.37     29110.95     83140.8732   82039.95     94160.691
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   78334.92     49753.26    291109.5      47636.1     165667.77
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   76217.76    640440.9     423432.       89979.3     720892.98
  132322.5      38114.1729    2778.7725 1058580.       52076.8431
   20986.3485  496775.7153  109563.03    223360.38    418139.1
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  245061.27     97918.65    335569.86    180286.7598  248766.3
  714541.5     116443.8      12062.5191   69601.635    25935.21
   31757.4     833065.4097   47106.81    386910.99    319161.87
   60339.06     73571.31    393262.47     80187.435  1280881.8
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  163021.32    192291.057  1032644.79    287404.47     60836.5926
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  168928.1964  465447.0402  182605.05    176571.144   213833.16
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 5.57549400e+04 2.33013570e+05 7.88985000e+03 7.88985000e+05
 9.36262200e+04 6.73267200e+05 2.62995000e+04 1.78836600e+05
 5.78589000e+04 4.24736925e+04 7.78465200e+04 3.26113800e+04
 5.73329100e+04 5.25990000e+04 2.16707880e+05 2.26175700e+04
 5.25990000e+05 5.25990000e+03 1.43332275e+04 3.89232600e+04
 1.36757400e+04 6.15408300e+04 2.55525942e+04 1.22555670e+04
 5.23360050e+03 8.94183000e+04 2.03821125e+04 3.13332243e+05
 2.15655900e+05 7.49314834e+05 9.46782000e+04 2.47215300e+05
 1.98824220e+05 4.47091500e+05 2.52475200e+04 8.57363700e+04
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9.52041900e+04 9.87335829e+04 2.03032140e+05 7.96874850e+04
1.78836600e+04 5.40875517e+04 4.10140703e+05 1.05198000e+04
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7.26918180e+05 1.29919530e+05 8.94183000e+05 1.47277200e+04
4.47091500e+04 1.35915816e+04 1.29340941e+06 1.23549791e+05
8.88923100e+04 2.15655900e+04 1.05198000e+05 6.31188000e+05
5.24412030e+05 5.68069200e+04 1.39913340e+05 1.79888580e+05
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4.94430600e+04 2.26964685e+04 2.15077311e+04 1.84622490e+05
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2.46689310e+05 1.32549480e+05 2.18811840e+05 3.43839663e+04
2.90346480e+05 5.68069200e+05 4.41831600e+05 1.73576700e+04
8.94183000e+03 4.70813649e+04 3.33477660e+05 5.51500515e+04
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4.97376144e+04 3.75556860e+03 3.47153400e+04 2.62995000e+05
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 1.28157463e+05 1.94616300e+04 4.12907410e+05 6.31188000e+03
 6.39603840e+04 6.57487500e+05 4.56033330e+05 8.94708990e+05
 8.41584000e+04 3.59777160e+05 8.78403300e+04 4.52351400e+04
 2.68254900e+05 3.42840282e+04 6.99566700e+04 1.33759257e+04
 2.17549464e+06 6.73267200e+04 3.98753019e+04 1.30971510e+05
 1.91986350e+04 6.79289785e+05 9.57301800e+04 1.68001206e+04
 2.86664550e+05 3.08756130e+04 4.26051900e+04 1.68369399e+06
 1.77784620e+05 3.10334100e+05 2.12499960e+05 3.05074200e+05
 2.82456630e+05 5.65439250e+05 2.73514800e+04]

PagoInt_T10 = [0.00000000e+00            nan 1.61466000e+04 3.88201939e+05
 2.77285562e+05 2.58345600e+05 2.09905800e+04 3.82136200e+04
 9.22509080e+03 1.30905868e+05 6.88921600e+04 2.51348740e+05
 1.80303700e+05 5.16691200e+04 1.14102640e+05 5.38220000e+03
 2.69056178e+04 1.39937200e+04 1.61466000e+05 6.60132212e+05
 8.19149311e+05 9.06900700e+04 6.11956140e+05 3.22932000e+05
 4.30576000e+04 2.68717099e+05 4.84398000e+04 4.35419980e+05
 3.87518400e+04 5.38220000e+02 5.38220000e+05 2.59422040e+05
 1.07644000e+04 1.85685900e+04 1.75115259e+05 9.68796000e+03
 6.45864000e+04 9.04209600e+04 3.76754000e+04 7.76651460e+05
 4.30576000e+05 1.41928614e+04 1.96972373e+05 6.02806400e+04
 1.72983908e+06 9.68796000e+05 1.88377000e+04 2.96021000e+04
 1.27364381e+05 9.77246054e+04 1.26481700e+05 3.53072320e+05
 5.92956974e+04 1.72230400e+05 2.15288000e+03 4.57487000e+04
 3.01403200e+04 1.82994800e+04 8.15403300e+04 1.02800020e+05
 4.62869200e+04 2.31434600e+04 8.01947800e+04 2.22284860e+05
 8.07330000e+03 1.07644000e+05 9.68796000e+04 1.24867040e+05
 8.61152000e+04 5.38220000e+04 8.66534200e+05 2.94567806e+05
 3.44460800e+04 4.35958200e+04 1.63618880e+05 6.33942427e+05
 1.53930920e+05 3.28314200e+04 1.48010500e+05 1.42628300e+04
 1.13026200e+06 9.83866160e+03 1.85901188e+04 2.18248210e+06
 4.93547740e+03 3.49843000e+04 7.48341088e+04 2.10444020e+05
 4.72018940e+05 9.25738400e+05 2.42199000e+05 4.84398000e+03
 1.31621701e+05 2.07214700e+05 1.68462860e+05 1.72230400e+04
 2.15826220e+05 4.36130430e+05 3.67012218e+05 1.50701600e+06
 3.73513916e+05 4.52104800e+04 3.70833580e+05 4.63515064e+04
 7.64229342e+05 2.54039840e+05 1.19484840e+05 3.71371800e+04
 5.43494556e+04 3.94515260e+05 6.15185460e+05 7.64272400e+05
 4.09047200e+04 6.72775000e+04 6.45864000e+03 1.11465362e+05
 8.66534200e+04 1.99141400e+04 2.41660780e+05 1.13026200e+04
 4.93493918e+04 7.15832600e+04 2.58345600e+04 5.48984400e+04
 1.69539300e+05 1.20561280e+05 6.22774362e+04 1.47666039e+05
 1.32978015e+05 6.04151950e+04 5.11309000e+04 6.99686000e+03
 2.69110000e+04 5.86659800e+04 1.04952900e+05 4.52643020e+05
 8.07330000e+04 2.15288000e+04 4.82245120e+05 6.87306940e+05
 6.56628400e+04 1.52553077e+05 1.18408400e+05 4.93197897e+05
```

```
 1.34555000e+04 2.47640404e+05 1.49086940e+05 2.23361300e+05
 2.38969680e+05 7.53508000e+03 7.42743600e+04 8.88063000e+04
 2.71962566e+04 9.95707000e+04 1.25405260e+05 1.19743186e+05
 6.62010600e+04 2.63727800e+04 1.45857620e+05 9.09591800e+05
 2.56300364e+04 4.06905084e+05 6.41838114e+05 7.96565600e+04
 1.23790600e+04 2.44351880e+05 1.02423266e+06 2.85256600e+04
 3.06785400e+05 3.94090066e+05 5.59748800e+04 1.07644000e+06
 6.78157200e+04 8.34241000e+04 4.16582280e+05 3.20240900e+05
 1.35792906e+06 3.12167600e+05 1.00108920e+05 4.26237947e+05
 2.69110000e+05 3.45537240e+05 2.15288000e+05 4.37519038e+04
 1.34555000e+05 1.56083800e+05 1.18946620e+05 3.17011580e+05
 8.28858800e+04 1.38860760e+06 1.89528791e+05 8.12712200e+04
 1.09796880e+06 1.00647140e+05 4.04741440e+05 3.70026250e+05
 8.77998286e+04 9.84942600e+04 1.60927780e+05 2.94406340e+05
 8.07330000e+05 7.53508000e+04 3.61683840e+05 9.20356200e+04
 2.05869150e+04 5.43602200e+04 3.98282800e+05 1.13435247e+05
 1.35093220e+05 3.46290748e+04 1.07374890e+04 1.30249240e+05
 3.22932000e+03 2.21208420e+05 5.97424200e+04 2.61036700e+05
 2.47581200e+05 6.40481800e+04 2.55654500e+05 1.95320038e+06
 2.07752920e+05 2.40923419e+05 2.86333040e+05 2.41929890e+04
 1.29172800e+06 6.94303800e+04 3.44460800e+05 1.60271152e+05
 2.22338682e+04 3.41769700e+05 1.12735561e+05 6.11590150e+05
 7.50278680e+03 4.77401140e+05 1.48548720e+06 6.67392800e+04
 6.24873420e+05 1.49194584e+04 1.41013640e+05 2.52963400e+04
 5.70513200e+04 3.33696400e+04 2.17440880e+05 1.07105780e+05
 5.81277600e+04 1.00862428e+06]

PagoInt_T11 = [0.00000000e+00            nan 9.94874500e+05 1.51651140e+05
 2.98924832e+05 3.07771149e+05 9.91110110e+03 3.77455385e+05
 7.92135210e+04 4.35593700e+04 1.31753650e+05 3.17284300e+05
 3.22662000e+04 5.37770000e+03 2.65120610e+05 1.83835599e+06
 2.68885000e+05 1.14545010e+05 1.10861285e+05 9.72825930e+03
 7.09533738e+04 2.25863400e+05 6.30804210e+05 8.81942800e+04
 5.06676139e+05 1.05080258e+06 1.22573916e+05 6.77590200e+04
 3.97949800e+04 8.69574090e+05 5.69654383e+05 3.28039700e+04
 1.07554000e+04 6.13122332e+05 1.09167310e+04 1.55953300e+04
 7.85574416e+05 3.38795100e+04 1.08091770e+05 2.60603342e+05
 3.06528900e+04 1.34442500e+04 2.15215554e+04 2.16861130e+05
 2.80823494e+04 3.33417400e+04 2.36618800e+04 1.67784240e+05
 5.66809580e+05 4.43660250e+04 9.03453600e+04 8.06655000e+04
 1.61331000e+04 1.00966318e+05 9.62608300e+04 2.68885000e+04
 8.29510225e+04 4.30216000e+05 3.76439000e+04 2.74262700e+05
 1.58319488e+04 4.40971400e+05 1.21536020e+05 6.89227543e+05
 1.91446120e+05 9.67986000e+04 1.98974900e+04 4.40971400e+04
 2.47911970e+05 8.14721550e+04 1.22073790e+05 5.27014600e+04
 2.58129600e+04 3.60305900e+04 4.42584710e+05 3.22662000e+05
 1.61331000e+05 1.03251840e+05 5.37770000e+05 9.78741400e+04
 7.79766500e+04 7.09856400e+04 6.13057800e+04 1.46273440e+05
```

```
5.08832596e+05 2.15108000e+05 3.05453360e+05 2.49525280e+05
6.32202412e+04 4.61460437e+04 5.47767144e+05 3.11906600e+04
1.82841800e+05 2.31241100e+04 6.45324000e+04 3.01151200e+04
1.20998250e+05 3.30190780e+05 6.04668588e+05 3.10293290e+05
1.80636943e+04 3.13896349e+04 2.47374200e+04 5.91547000e+04
2.07041450e+05 8.17410400e+04 1.45197900e+05 2.12956920e+05
8.58603582e+04 3.49550500e+04 5.48525400e+05 2.25863400e+04
2.73187160e+05 9.57230600e+04 2.78564860e+05 1.34442500e+05
3.44172800e+04 6.23813200e+04 5.06848225e+04 1.47348980e+06
1.88219500e+04 6.99101000e+04 1.39820200e+04 1.93693999e+05
5.37770000e+04 1.66170930e+05 4.83993000e+05 1.07554000e+05
2.23174550e+05 3.86118860e+05 2.15108000e+04 7.36207130e+05
1.86068420e+05 5.60517671e+04 5.59280800e+04 1.39820200e+06
2.95789633e+05 6.99101000e+03 2.04352600e+05 5.14914775e+04
8.60432000e+03 2.39307650e+05 1.12393930e+05 1.19384940e+05
7.07167550e+05 1.42175633e+05 4.03176924e+05 5.38845540e+05
4.95877717e+04 3.48582514e+04 3.71061300e+04 4.57104500e+04
1.27709620e+05 8.03966150e+05 6.76944876e+05 1.39615847e+05
2.45223120e+05 8.92698200e+04 6.45324000e+03 1.27451490e+05
3.41483950e+05 6.94261070e+03 1.45897001e+05 8.33543500e+04
1.24224870e+05 1.70473090e+05 8.06655000e+03 2.45760890e+05
4.46349100e+04 1.10242850e+05 1.29602570e+05 1.35872968e+05
8.76565100e+04 8.98075900e+04 3.22608223e+04 1.02176300e+04
2.15108000e+03 9.94874500e+04 9.77396975e+04 1.66708700e+04
2.41996500e+04 2.80102882e+05 1.65633160e+05 5.32392300e+04
4.77991487e+05 3.39870640e+05 4.03327500e+04 2.58479150e+05
1.88219500e+05 5.98215348e+04 6.66834800e+04 4.04628903e+05
3.17284300e+04 2.46890207e+04 1.73936329e+05 7.52878000e+04
2.09730300e+04 6.72212500e+04 4.26505387e+04 1.81766260e+05
3.00989869e+04 1.27989260e+05 5.64658500e+04 4.19460600e+05
1.17233860e+05 1.01638530e+05 4.89370700e+04 2.42846177e+05
3.25996174e+05 1.94672740e+05 3.89861739e+05 1.14432078e+05
2.56193090e+06 1.05940690e+05 5.43846801e+04 3.56541510e+05
6.93185530e+05 3.11906600e+05 3.15100954e+05 2.04890370e+05
7.86757510e+05 4.32904850e+04 5.80791600e+04 2.89874163e+05
1.43364104e+05 2.47374200e+05 2.63023307e+04 1.91983890e+05
4.09780740e+05 6.11336936e+04 9.14209000e+04 3.99563110e+05
2.79640400e+04 2.74262700e+04 2.20485700e+04 9.20221269e+05
5.96924700e+04 6.29631871e+05 3.89345480e+05 1.43584590e+05
8.73876250e+05 4.78615300e+04 3.76439000e+05 2.21023470e+05
3.50626040e+05 1.04327380e+05 3.62994750e+05 5.86169300e+04
1.89031533e+05 5.91547000e+03 3.81816700e+04 3.25329339e+05
7.39971520e+05 2.95773500e+05 1.77087661e+04 8.46993128e+05
7.20611800e+05 7.54114871e+05 1.05913802e+05 2.31241100e+05
1.35086748e+06 2.27315379e+04 3.00505876e+05 1.96823820e+05
8.62507792e+05 1.51113370e+05 2.24357644e+04 1.41433510e+05
2.41996500e+05 5.10881500e+05 3.54928200e+05 8.28165800e+04
4.73237600e+04]
```

```
PagoInt_T12 = [0.00000000e+00            nan 4.53104400e+04 1.56968310e+05
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 4.31528000e+03 2.40177697e+05 3.80823460e+05 1.02487900e+04
 1.76818059e+06 1.81781170e+05 4.69286700e+04 1.34852500e+05
 1.37549550e+05 8.62052697e+05 6.90444800e+04 6.66602878e+04
 2.42734500e+04 7.01233000e+04 1.02218195e+06 2.45970960e+05
 7.12021200e+04 5.77168700e+04 1.62901820e+05 2.91281400e+04
 5.93351000e+05 1.61823000e+05 3.29040100e+04 3.77587000e+05
 8.51188980e+05 1.53904461e+05 2.06054620e+03 1.01409080e+05
 2.87510924e+05 1.78544710e+05 3.23646000e+04 6.58080200e+04
 2.69705000e+04 2.69705000e+03 1.88793500e+05 1.77357469e+08
 6.34880176e+05 4.60656140e+05 1.35003535e+05 3.18251900e+04
 3.50616500e+05 6.74262500e+04 2.10369900e+04 3.01638072e+04
 1.26221940e+06 8.17206150e+04 3.79205230e+05 1.92461488e+04
 5.28621800e+04 2.64310900e+04 3.41424954e+05 1.34852500e+04
 4.58498500e+04 5.00033070e+05 4.67129060e+05 2.31946300e+05
 1.62038764e+06 6.88540683e+05 7.01772410e+05 6.63474300e+04
 5.39410000e+04 2.74559690e+04 1.07882000e+05 2.10909310e+05
 2.03357570e+05 1.70102943e+05 1.61823000e+04 8.63056000e+04
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 3.50616500e+04 2.81814754e+05 1.19209610e+05 1.72611200e+05
 1.02487900e+05 3.11347452e+04 6.04139200e+04 2.35182760e+05
 1.67508381e+05 1.67217100e+04 3.34434200e+04 6.19361350e+05
 4.77917260e+05 1.82320580e+06 1.07882000e+04 5.39410000e+05
 1.56428900e+05 1.80297793e+05 3.97814875e+04 4.09412190e+05
 1.50279626e+05 1.93648190e+05 4.30988590e+03 3.16633670e+05
 1.17591380e+05 4.85469000e+04 2.21104159e+04 2.15764000e+04
 2.28170430e+05 4.54722630e+05 3.77587000e+04 8.09115000e+04
 6.13276805e+05 1.24911174e+05 1.61823000e+06 3.41484289e+05
 7.87538600e+04 6.47292000e+03 1.82859990e+05 1.07882000e+06
 1.76387070e+05 1.64573991e+04 9.22391100e+04 2.37340400e+04
 2.54601520e+05 1.13276100e+04 9.16997000e+05 1.39167780e+05
 2.02818160e+04 1.55889490e+05 5.35671889e+05 2.96675500e+04
 4.92481330e+05 1.31696951e+05 2.85887300e+04 9.51896827e+04
 8.73844200e+04 4.36922100e+04 3.02069600e+04 5.98745100e+04
 7.44385800e+04 4.31528000e+05 1.45694641e+04 8.09115000e+03
 5.65312468e+05 3.23646000e+05 1.33234270e+05 1.78005300e+04
 7.01233000e+03 3.61404700e+04 7.17415300e+04 4.80074900e+04
 2.78335560e+05 7.87538600e+05 4.26133900e+04 3.15554850e+05
 1.45640700e+04 1.15973150e+06 9.79946147e+04 5.27542980e+05
 6.13147347e+04 6.97457130e+03 4.31528000e+04 2.59456210e+05
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 2.66738245e+04 2.59456210e+04 3.15554850e+04 4.75759620e+05
 2.29114397e+05 2.68086770e+05 1.40246600e+04 9.40633946e+05
 5.86338670e+05 3.27901945e+05 2.48829833e+06 5.34555310e+05
```

```
 1.16512560e+05 2.27631020e+05 2.45161845e+05 1.21367250e+05
 1.70453560e+05 3.99163400e+05 1.57507720e+05 7.24751276e+04
 2.66069377e+05 1.26761350e+05 3.00710287e+05 6.27495653e+05
 2.46510370e+05 2.72941460e+04 4.09951600e+04 2.26552200e+05
 4.83958652e+05 2.90029969e+05 6.31109700e+04 4.79535490e+05
 3.20948950e+05 2.42734500e+05 1.72611200e+04 5.92067204e+05
 2.43273910e+05 1.68295920e+05 2.69651059e+04 2.48128600e+04
 3.74301993e+05 2.22371772e+05 1.39869013e+06 1.13276100e+05
 1.22985480e+05 1.99581700e+05]

FlgAct_T01 = [0 1]

FlgAct_T02 = [ 0.  1. nan]

FlgAct_T03 = [ 0.  1. nan]

FlgAct_T04 = [ 0.  1. nan]

FlgAct_T05 = [ 0.  1. nan]

FlgAct_T06 = [ 1.  0. nan]

FlgAct_T07 = [ 1.  0. nan]

FlgAct_T08 = [ 1.  0. nan]

FlgAct_T09 = [ 1.  0. nan]

FlgAct_T10 = [ 1.  0. nan]

FlgAct_T11 = [ 0.  1. nan]

FlgAct_T12 = [ 1.  0. nan]

FacAN_T01 = [      0    7000   80000   38000  200000   24000   50000   45000
97300
  800000   17000   40000    8500  140000   18000   20000  280000   30000
    5000   66000   12000   43000  100000  190000  273000   76000   19000
   22000   11347  400000   32000  300000   10000    8563  225000   97108
   33000   10783  120000  750000   27000   74000   49000   60000   37000
    3629   77000  107000   75000  402983   23000   35000   15000  105000
   82000  150000   25000  155000   70000   57000   16000  680000  117000
  250000   13000  320000   36778   61691  113000  110000   14000   67609
  480000  350000   90000  130000  160000  205000   92000   87000   67000
  237000  210000 1700000   95000  125000  128000   79000  141817  248000
  145000  600000  251846   42000   71000  232000      77   44000  720000
   62000  167000  113107   69000    1990   51000  349000  490000   54000
   77104   24865  164500  177000    7180   28000  165000  764700  115000
```

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  341000   246000   499053     8000   253485   112000   260000   450000    47000
   95911   493000    93541    29000    65000     2000    48000   290000   194000
  164529   139369    55000   220000     1500     1812   285780    38166   455000
   85000   182000    54099   132000   323891    18247     4792     9000   331000
  224000     4000    11370    16575    59000    38962    34737   104000   217000
   26456    46000    26000    97000    31783    90936    83000   188000   270000
  137000   164000   147000     3000   227000    47590   500000    74940    36000
  496000   310000   161000    68000    19265     6500    59943    69450     9361
   41110    50977    89270    49345    17015   230000   241000   219500    11540
   67663    29118   149000    42277   117812    86000      866    45010    21000
   29848    34000    30150     3900      958   360000   114000    76063    37568
  159000    80941     9623    81000     6000    19583   778000     5615   135000
  157500    29629    55656     6990    12990   180000    28257    46235    18259
   33473    84000     2808    98000    89000     8176     4190   320500     8546
   62817    20708    64865   169000    41000     4900     4249    33323    94000
  142000    73000     1000     6152    44292    98966   324000   170000     2590
     800   148545   109000     2500    58000    51868    99000     5708   111000
   54900    36139   131000     8887    21434   148000   262500     7754    28233
   80901    11000    32381    16640    39189     2909    34626   275400      600
  215000   122000    22509   150149   427000   550000      154   157000   183470
   52000   146000    54366   172000   475000   187000   245000    14788    61000
  212000    24697    50381   197000    13651     4500   162300   240000   420000
  745000   186435]

FacAN_T02 = [0.00000e+00 1.00000e+05 1.62000e+05 1.00000e+04 4.57700e+04
3.70000e+04
 8.00000e+04 3.00000e+04 5.00000e+04 4.00000e+04 2.27000e+05 4.00000e+05
 1.10000e+05 1.50000e+06 6.00000e+04 5.00000e+05 1.15000e+05 2.00000e+04
 1.50000e+05 1.70000e+04 2.50000e+04 1.40000e+04 6.00000e+05 2.60000e+04
 7.00000e+03 8.20000e+04 8.70000e+04 3.33460e+04 6.53070e+04 5.00000e+03
 5.80000e+04 2.00000e+05 5.70000e+04 6.40000e+04 6.70000e+04 5.40000e+04
 2.50000e+05 8.80850e+04 1.30000e+05 1.02000e+05 7.40000e+04 3.50000e+04
 2.69000e+05 1.17000e+05 1.60000e+05 1.39810e+04 3.40000e+04 3.10000e+04
 1.15000e+06 1.20000e+05 3.85220e+04 3.70000e+05 1.14610e+04 7.96230e+04
 2.90000e+05 5.81210e+04 1.04000e+05 1.44000e+05 1.55210e+04 3.80000e+04
 2.45970e+04 7.00000e+04 9.00000e+03 2.70000e+04 4.60000e+04 1.48000e+05
 4.50000e+04 3.68400e+05 1.91000e+05 2.10000e+04 2.40000e+04 2.10000e+05
 1.72000e+02 7.29400e+03 1.32421e+05 3.00000e+05 4.70000e+05 4.35000e+04
 2.20000e+05 3.26060e+04 3.30000e+04 5.46150e+04 5.63600e+03 6.50000e+04
 3.90000e+04 1.35000e+05 1.50000e+04 2.20000e+04 3.29000e+05 6.20000e+04
 1.80000e+05 9.00000e+04 1.00000e+06 2.80000e+04 6.33240e+04 1.07000e+05
 4.20000e+04 1.61880e+04 5.60000e+03 5.10000e+05 3.34820e+04 8.00000e+03
 4.90000e+04 2.60000e+05 7.70000e+04 2.19320e+04 5.50000e+03 6.11000e+05
 6.30000e+04 5.50000e+04 2.90000e+04          nan 4.24600e+03 3.08000e+05
 6.99160e+04 2.25010e+04 3.20000e+04 2.30000e+05 1.38000e+05 6.00000e+03
 3.41280e+04 4.04000e+03 4.70000e+04 4.76000e+04 6.80000e+04 4.83650e+04
 9.18900e+03 7.20000e+04 6.10000e+04 5.64660e+04 7.90000e+04 4.00000e+03
 1.31316e+05 1.47000e+05 1.70000e+05 1.18000e+05 5.87200e+04 1.13996e+05
```

3.60000e+04 2.67000e+05 7.10000e+04 3.30000e+05 4.89000e+05 1.30000e+04
6.20000e+05 1.40000e+05 6.46880e+04 1.90000e+05 1.43775e+05 8.75880e+04
1.29400e+04 1.46991e+05 2.15000e+05 2.57000e+05 1.49833e+05 1.27000e+05
1.00000e+00 5.33400e+03 5.27000e+05 2.94170e+04 1.39960e+04 2.00000e+03
6.05000e+04 6.57230e+04 4.00710e+04 2.11000e+05 2.98000e+02 9.90000e+04
1.09000e+05 2.98010e+04 5.60000e+04 2.70000e+05 2.94600e+03 1.10000e+04
8.50000e+04 2.87000e+05 2.29000e+05 8.17390e+04 3.41000e+05 7.55000e+05
7.50000e+04 2.65087e+05 4.80000e+04 1.99452e+05 2.64560e+05 1.37000e+05
1.64000e+05 9.17340e+04 2.57970e+05 1.25670e+04 2.65000e+05 2.15100e+04
1.37689e+05 6.90000e+04 1.20000e+04 8.04000e+02 4.07030e+04 1.65000e+05
3.10000e+05 1.29409e+05 3.91000e+05 1.51566e+05 2.24740e+04 4.63510e+04
3.99900e+04 1.97000e+05 2.20000e+03 9.90770e+04 3.03000e+05 5.10000e+04
3.90000e+01 2.60000e+02 1.18620e+04 2.34990e+04 2.49900e+04 5.41630e+04
1.80000e+04 1.48549e+05 3.99500e+04 4.50000e+03 1.75000e+05 2.30000e+04
7.30000e+04 3.00000e+02 5.30000e+04 5.20000e+04 4.22680e+04 1.90000e+04
1.43100e+05 2.98820e+04 1.13090e+04 1.72690e+04 8.37040e+04 6.43000e+04
1.84490e+04 1.45000e+05 1.42000e+05 4.64900e+03 1.36000e+05 5.00000e+02
3.60000e+05 9.73000e+02 6.66000e+02 2.74600e+04 1.47380e+04 1.32500e+04
6.67100e+03 2.80000e+05 1.54600e+04 2.75040e+04 2.49000e+03 1.39000e+05
1.01000e+04 6.31000e+02 3.12000e+05 3.06000e+05 3.00000e+03 3.58400e+03
4.10000e+04 9.90200e+03 1.60889e+05 4.40180e+04 9.50000e+04 5.50100e+03
3.50000e+05 1.67700e+04 5.59800e+03 2.29750e+04 4.40000e+04 7.21400e+03
1.58256e+05 3.58800e+03 2.22200e+03 3.84520e+04 1.40000e+03 1.77440e+04
1.81000e+05 1.26900e+03 6.59000e+02 3.11100e+03 4.20200e+03 1.18110e+04
2.88000e+03 5.05000e+05 1.95000e+05 2.61900e+03 8.44900e+03 5.01160e+04
3.50000e+03 3.80000e+05 1.29790e+04 1.69790e+04 1.30010e+05 4.57660e+04
7.10000e+05 9.08100e+03 1.50000e+02 1.13000e+04 1.00736e+05 2.88000e+05
5.36600e+03 1.45610e+04 1.83960e+04 8.50000e+03 5.90000e+04 1.52000e+05
4.79000e+04 1.11380e+04 2.40000e+05 3.68400e+04 7.34400e+03 1.17900e+03
6.17000e+02 1.14000e+05 1.60000e+04 1.00250e+04 1.36425e+05 2.17000e+05
8.80000e+04 8.97500e+03 3.29960e+04 3.68380e+04 3.24700e+04 3.40000e+05
1.35770e+04 2.27590e+04 6.60000e+04 1.27520e+04 1.76000e+05 6.01540e+04
1.22000e+05 1.07240e+04 2.14380e+04 1.32400e+03 1.52780e+04 4.54000e+03
4.90200e+03 6.87300e+03 4.29080e+04 9.92700e+03 6.75840e+04 2.37000e+05
1.07785e+05 2.85020e+04 3.56600e+03 1.71730e+04 1.68257e+05 2.14000e+05
3.91900e+03 1.88530e+04 2.55000e+05 1.77000e+05 9.40000e+04 8.00000e+00
2.61100e+04 2.55390e+04 1.53530e+05 7.96350e+04 8.40000e+04 6.42500e+03
9.20000e+04 6.50000e+05 1.00000e+03 1.01643e+05 2.74000e+05 8.60940e+04
2.21000e+05 8.60000e+04 3.12180e+04 1.55500e+05 1.34000e+05 1.02400e+04
4.39400e+04 1.85000e+05 1.33000e+05 8.00000e+05 2.53930e+04 2.37860e+04
1.43640e+05 8.50000e+05 2.07385e+05 6.30000e+05 2.85000e+05 1.36970e+04
5.72600e+04 1.05000e+05 1.08000e+05]

FacAN_T03 = [0.00000e+00 1.80000e+05 4.00000e+04 2.00000e+05 3.70000e+04
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1.70000e+04 1.20000e+05 1.15000e+05 8.30000e+04 7.00000e+03 5.00000e+05
6.70000e+04 1.07530e+04 3.50000e+05 6.07000e+05 3.00000e+04 8.00000e+03
9.20000e+04 5.80000e+04 1.50000e+04 4.40000e+04 1.02000e+05 7.50000e+04

7.00000e+04 5.40000e+04 1.50000e+05 5.00000e+03 6.35000e+04 2.68915e+05
1.40000e+05 3.80000e+04 2.00000e+04 1.40000e+04 2.20000e+04 5.00000e+04
4.90000e+04 3.40000e+04 3.53900e+03 2.83000e+05 1.71000e+05 5.45000e+03
6.00000e+04 5.51320e+04 2.50000e+05 1.20303e+05 3.20000e+05 2.55880e+04
4.77000e+03 1.26724e+05 8.00000e+04 4.00000e+05 3.00000e+05 3.20120e+05
1.00790e+04 5.29000e+05 2.70000e+05 1.87000e+05 9.39500e+03 6.80000e+04
7.10000e+04 4.00000e+03 1.17000e+05 nan 1.00000e+04 2.50000e+04
9.50000e+04 6.50190e+04 2.40000e+04 4.90000e+05 2.80000e+05 9.00000e+05
1.05000e+04 2.70000e+04 3.30000e+05 5.10000e+04 3.00000e+03 3.82000e+03
6.40000e+04 2.30000e+05 6.00000e+05 4.50000e+04 1.60000e+04 3.10000e+04
5.50000e+04 2.55150e+04 1.18000e+05 6.19530e+04 1.10000e+04 7.71500e+03
8.70000e+04 7.60000e+04 3.50000e+04 2.90000e+05 3.20000e+04 7.40540e+04
1.15000e+04 6.50000e+04 1.70000e+05 2.50000e+03 3.60000e+05 1.20000e+04
1.80000e+04 5.60000e+04 1.00000e+06 4.10000e+04 1.42680e+05 2.60000e+04
1.25000e+05 2.60000e+05 1.55000e+05 2.97000e+05 1.90000e+04 8.56600e+03
1.21000e+05 1.06112e+05 2.46000e+05 4.08000e+05 9.00000e+04 1.60000e+05
1.28110e+05 9.00020e+04 1.30000e+05 4.20000e+04 2.08000e+05 1.01000e+05
4.55710e+04 7.20000e+04 1.85330e+05 1.96424e+05 9.70000e+04 8.50000e+04
5.47650e+04 1.30000e+04 4.17000e+05 1.47000e+05 1.68820e+04 7.70000e+04
1.37758e+05 7.21900e+03 2.25000e+04 1.05500e+04 6.00000e+03 4.70000e+04
1.43040e+04 8.90000e+04 1.94000e+05 6.70000e+03 2.74100e+03 4.19000e+05
1.94600e+04 5.80700e+03 6.62600e+04 8.96400e+03 2.47200e+04 1.51000e+05
5.46210e+04 2.00000e+03 4.73630e+04 2.69276e+05 1.35000e+05 9.25000e+04
1.04000e+05 8.88320e+04 1.10000e+05 1.54000e+05 2.58000e+05 7.34000e+04
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9.90000e+04 2.65600e+04 2.10000e+04 2.14368e+05 3.66740e+04 1.64130e+04
2.69590e+05 8.00605e+05 2.39130e+04 9.20000e+03 2.70340e+04 1.85000e+05
3.52000e+02 5.20000e+04 1.26009e+05 1.60000e+01 7.14500e+03 2.70930e+04
1.00480e+04 8.10000e+04 1.02500e+04 5.80000e+03 2.47330e+04 1.76500e+04
1.58390e+04 7.17700e+03 2.14890e+04 5.30000e+04 1.99999e+05 8.89000e+04
6.35400e+04 1.09000e+05 2.83100e+03 1.02160e+04 8.80000e+04 4.19000e+03
3.40000e+05 4.60000e+04 1.25500e+04 5.12000e+02 2.86030e+04 5.24070e+04
1.86310e+04 1.14000e+05 1.12000e+05 6.20000e+04 1.40654e+05 1.75800e+03
7.77360e+04 2.04400e+04 6.40000e+01 6.46200e+03 1.71230e+04 2.21840e+04
3.97820e+04 3.30000e+04 2.17210e+04 1.67770e+04 2.76900e+04 6.30000e+04
1.68000e+04 4.11900e+03 6.58200e+03 5.77300e+04 1.23601e+05 7.50000e+03
8.72000e+04 1.99980e+05 1.79000e+05 3.05020e+04 2.07000e+05 4.45000e+03
2.78030e+04 1.98540e+04 3.57000e+05 5.09380e+04 2.19000e+03 1.43060e+04
4.27180e+04 9.10000e+03 1.41723e+05 8.50000e+03 2.30000e+04 2.80000e+04
1.69530e+04 2.18900e+04 1.12410e+04 4.30000e+04 8.12100e+03 2.51490e+04
8.17200e+03 7.84400e+03 4.10170e+04 1.92910e+04 6.41100e+03 1.24000e+04
2.45120e+04 1.82000e+04 2.17000e+05 9.74000e+03 2.89040e+04 5.59300e+03
1.27700e+03 1.93800e+03 9.20000e+01 1.85980e+04 1.57730e+05 1.94490e+04
8.93490e+04 8.37500e+03 1.17210e+04 4.50000e+05 1.89000e+05 1.27000e+05

```
 6.70000e+05 1.42974e+05 5.10000e+05 1.06000e+05 7.08580e+04 1.45000e+05
 1.05000e+05 6.55200e+03 1.15700e+05 5.22880e+04 1.20000e+06 1.74000e+05
 8.60900e+03 8.00000e+05 3.14000e+03 1.59000e+05 1.78000e+05 9.17600e+03
 2.98000e+02 3.90000e+04 1.92000e+05 2.04720e+04 1.44000e+05 1.23450e+04
 4.07000e+05 1.07000e+05 4.80000e+05 8.26800e+03 1.32000e+02 3.87000e+05
 5.52660e+04]

FacAN_T04 = [0.000000e+00 3.500000e+04 2.410000e+05 7.000000e+04 3.390000e+05
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 1.600000e+04 3.500000e+05 7.000000e+03 1.500000e+04 2.500000e+04
 4.000000e+04 5.500000e+04 6.000000e+04 1.000000e+05 3.300000e+04
 8.000000e+04 2.700000e+05 1.100000e+04 5.000000e+04 6.500000e+04
 2.200000e+05 1.100000e+06 3.478410e+05 2.000000e+05 9.000000e+03
 8.500000e+04 2.693400e+04 3.900000e+04 3.400000e+04 1.000000e+04
 2.650000e+05 1.500000e+05 1.900000e+04 1.850000e+05 3.200000e+04
 1.040000e+05 3.000000e+03 1.070000e+05 2.482150e+05 3.000000e+05
 1.200000e+05 3.895700e+04 3.700000e+04          nan 2.899000e+04
 7.400000e+04 1.400000e+04 9.000000e+04 5.000000e+05 5.000000e+03
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 1.240000e+05 5.400000e+04 2.300000e+04 1.900000e+05 2.800000e+05
 1.250000e+05 1.540000e+05 4.200000e+04 1.876600e+04 7.900000e+04
 4.333700e+04 4.700000e+04 8.600000e+04 3.960000e+03 1.050000e+05
 5.300000e+04 3.827000e+03 1.693430e+05 9.200000e+04 1.800000e+05
 1.700000e+05 6.000000e+05 6.245100e+04 7.625000e+03 1.593730e+05
 5.200000e+04 2.890000e+05 1.185775e+06 7.582600e+04 2.700000e+04
 2.013300e+04 4.100000e+04 1.108000e+04 9.200000e+03 2.170000e+05
 2.340700e+04 1.282970e+05 8.300000e+04 1.538790e+05 4.512200e+04
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 7.500000e+04 4.590100e+04 1.110000e+05 1.600000e+05 5.900000e+04
 2.750500e+04 1.000000e+06 6.400000e+04 7.473000e+05 2.400000e+04
 9.234000e+03 5.521750e+05 9.740500e+04 8.200000e+04 2.050000e+05
 1.260300e+04 1.550000e+04 1.340000e+05 4.500000e+04 2.769260e+05
 1.044500e+04 3.527000e+03 2.993100e+04 3.943600e+04 7.619200e+04
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 2.542600e+04 6.069000e+04 4.400000e+04 1.350000e+05 2.278400e+04
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 5.100000e+04 4.000000e+03 9.292900e+04 2.760000e+05 5.700000e+04
 2.800000e+04 4.743600e+04 6.700000e+04 3.098000e+04 9.697600e+04
 2.300000e+05 1.333000e+04 5.600000e+04 9.700000e+04 9.400000e+04
 2.910000e+05 1.800000e+04 8.000000e+05 6.916100e+04 1.180000e+05
 6.300000e+04 7.873000e+03 8.491000e+03 2.080000e+05 2.900000e+04
```

```
 1.500000e+02 8.401000e+03 6.200000e+04 3.071000e+03 8.370000e+05
 1.510000e+02 1.007100e+05 2.897000e+03 7.777600e+04 1.360000e+05
 1.750000e+05 6.819600e+04 1.580000e+05 8.000000e+03 4.300000e+04
 3.022900e+04 5.750000e+04 2.120600e+04 1.650000e+05 1.823600e+04
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 6.924280e+05 1.374500e+04 3.500000e+03 5.654000e+03 3.560100e+04
 3.995500e+04 4.210400e+04 6.622400e+04 3.800000e+04 2.400000e+01
 7.909000e+03 8.000000e+00 1.482300e+04 1.520200e+04 1.880000e+05
 2.900000e+05 5.351200e+04 8.044500e+04 8.800000e+04 4.190000e+03
 1.908140e+05 2.501500e+04 1.074880e+05 2.388000e+04 2.077700e+04
 1.299000e+04 2.250000e+05 9.520000e+03 4.057200e+04 1.723600e+05
 7.823100e+04 2.371000e+03 2.774400e+04 7.925700e+04 4.000000e+05
 1.054600e+04 7.830000e+02 8.482400e+04 7.382000e+03 7.689500e+04
 1.320000e+05 1.190000e+05 7.275000e+03 4.144000e+03 3.477100e+04
 2.883400e+04 1.840000e+05 2.600000e+05 1.331000e+03 2.197040e+05
 1.800000e+06 6.187100e+04 9.900000e+04 2.681400e+04 7.100000e+04
 1.159800e+04 3.595000e+03 3.370990e+05 4.545700e+04 8.828000e+03
 3.200000e+05 4.170000e+05 1.120000e+05 5.612700e+04 7.700000e+04
 2.610900e+04]

FacAN_T05 = [0.00000e+00 1.00000e+04 1.40000e+05 2.74562e+05 5.00000e+04
1.79143e+05
 8.00000e+04 3.70000e+04 2.70000e+04 4.54000e+05 9.00000e+04 1.00000e+05
 2.00000e+05 2.00000e+04 1.70000e+05 7.00000e+03 4.00000e+04 7.80000e+04
 2.30000e+04 3.20000e+05 1.35197e+05 7.00000e+04 1.70000e+04 6.50000e+04
 6.00000e+04 1.85000e+05 1.25000e+05 8.50000e+04 3.00000e+05 3.00000e+04
 3.81160e+04 1.35000e+05 1.35039e+05 1.20000e+05 7.30000e+04 7.50000e+04
 3.30000e+04 8.20000e+04 2.94200e+03 1.20000e+04 2.60000e+04 3.60000e+05
 1.50000e+05 1.55900e+06 6.80000e+04 5.50000e+04         nan 6.00000e+03
 1.60000e+05 6.58620e+04 3.90000e+05 2.50000e+04 1.90000e+04 3.60000e+04
 1.40000e+04 3.28040e+04 5.00000e+03 4.19000e+03 1.59000e+05 1.83843e+05
 1.50000e+04 4.50000e+04 6.01210e+04 2.50000e+05 2.40000e+05 6.71900e+04
 3.17030e+04 2.49580e+04 3.50000e+04 8.71750e+04 2.80000e+05 4.08000e+05
 1.10008e+05 1.84000e+05 2.10000e+05 1.46549e+05 3.36960e+04 1.73000e+04
 2.43160e+04 1.59700e+04 4.00000e+03 1.36000e+05 1.47000e+05 4.47000e+02
 1.08000e+05 1.71000e+05 2.07080e+04 5.80000e+04 5.10000e+04 1.05530e+04
 1.29390e+04 2.11000e+05 2.90000e+05 4.70000e+05 5.67580e+04 5.70000e+04
 8.66000e+03 7.70000e+04 4.00000e+05 1.37000e+05 1.88940e+04 2.80000e+04
 5.40000e+04 1.39000e+05 1.16000e+05 4.20000e+04 4.40000e+04 3.30000e+03
 8.00000e+03 1.10000e+05 3.49980e+04 7.10000e+04 1.60000e+04 1.09226e+05
 6.30520e+04 8.70000e+04 1.58000e+05 2.40000e+04 5.00000e+05 4.30000e+04
 3.40000e+04 3.06680e+04 1.19000e+05 1.49000e+05 1.80000e+05 7.59200e+03
 2.20000e+04 6.74680e+04 1.17000e+05 9.40000e+04 6.40000e+04 4.18900e+04
```

```
 2.75000e+04 6.18000e+05 1.30000e+05 5.90000e+04 1.10000e+04 4.90000e+04
 2.20000e+05 1.58500e+05 1.15388e+05 2.61000e+05 1.56000e+05 4.71700e+04
 8.79430e+04 9.90000e+04 7.09100e+03 2.51780e+04 3.97000e+05 8.90000e+04
 2.00000e+03 2.70000e+05 2.44490e+04 8.00000e+05 1.99800e+03 1.12000e+05
 2.05530e+04 4.70000e+04 1.05000e+05 2.98000e+05 6.90000e+04 2.88890e+04
 1.30000e+04 4.80000e+04 1.48750e+04 3.02540e+04 2.60000e+05 2.10000e+04
 1.19797e+05 1.62000e+05 2.21840e+04 3.20000e+04 2.32920e+04 2.85000e+05
 2.01250e+04 3.00000e+03 1.17720e+04 9.50000e+03 8.58700e+03 6.00000e+05
 2.37000e+05 9.20000e+04 3.10000e+04 6.70000e+04 1.70400e+03 1.77000e+05
 2.96243e+05 1.18000e+04 1.07000e+05 1.29900e+04 1.90000e+05 4.64800e+03
 1.29240e+04 6.88240e+04 3.11000e+04 3.05000e+05 1.00000e+03 4.90000e+03
 2.70100e+03 2.28130e+04 1.24610e+04 1.71440e+04 1.12648e+05 2.81940e+04
 1.38000e+05 9.70000e+04 6.37330e+04 5.92000e+02 1.27000e+05 2.73800e+04
 3.90000e+04 5.75600e+03 1.80000e+04 2.62500e+04 4.03100e+03 4.20000e+03
 5.74220e+04 9.97220e+04 5.83050e+04 1.09050e+04 6.99100e+03 1.21000e+05
 3.10000e+05 7.90000e+04 8.25200e+03 1.11000e+05 2.36000e+03 4.07500e+03
 7.27480e+04 4.00700e+03 7.03900e+03 6.30000e+04 2.23079e+05 8.64100e+03
 4.10000e+04 1.29000e+05 3.43800e+03 1.49920e+04 9.99990e+04 2.15470e+04
 6.54590e+04 3.90530e+04 2.09790e+05 1.02470e+04 4.10360e+04 1.23000e+05
 1.29090e+04 5.30000e+04 1.64500e+04 1.91820e+04 1.05900e+03 6.20000e+04
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 5.60000e+04 1.22000e+05 1.15000e+05 1.89200e+04 1.32300e+03 1.07309e+05
 1.24700e+04 2.70400e+03 2.44000e+04 9.28800e+03 6.02200e+03 1.29580e+04
 4.69400e+03 5.86000e+04 1.97100e+03 2.29300e+03 2.90000e+04 2.86130e+04
 3.19700e+04 1.83000e+05 9.80000e+04 1.44720e+05 2.03820e+04 1.41060e+04
 1.13600e+04 7.20000e+04 7.26400e+03 1.65100e+03 5.64960e+04 1.65000e+05
 3.80000e+05 3.16690e+04 2.16120e+04 9.00000e+03 1.98000e+05 4.21800e+03
 5.80000e+05 3.65000e+05 1.13793e+05 1.60450e+04 1.06295e+05 1.94524e+05
 2.28424e+05 2.07000e+05 3.70667e+05 1.60000e+01 2.75000e+05 1.55000e+05
 4.05000e+04]

FacAN_T06 = [0.00000e+00 2.25000e+05 3.00000e+05         nan 2.55000e+05
2.50000e+05
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 4.00000e+04 8.92000e+04 2.00000e+05 6.50000e+04 1.70000e+04 1.40000e+05
 2.00000e+04 3.00000e+04 5.00000e+04 1.00000e+04 5.70000e+04 1.30000e+05
 1.20000e+04 1.45000e+05 1.91000e+05 2.17000e+05 2.36759e+05 8.15000e+05
 1.60000e+05 1.12000e+05 1.67000e+05 1.50000e+04 5.08300e+03 7.00000e+04
 1.34000e+05 1.27000e+05 4.00000e+05 1.20000e+05 8.00000e+03 4.10000e+04
 2.99600e+03 3.70000e+04 6.60000e+04 5.00000e+03 6.00000e+03 4.50000e+04
 3.50000e+04 5.25740e+04 1.05000e+04 4.19000e+03 2.50000e+04 4.60000e+05
 3.60000e+04 9.83100e+04 4.40000e+04 7.50000e+04 2.06000e+05 1.50000e+05
 3.14290e+04 6.00000e+04 1.86600e+03 5.80000e+04 4.80000e+04 1.30144e+05
 2.23000e+04 8.64000e+02 5.50000e+04 8.30000e+04 9.00000e+04 1.10000e+05
 2.78460e+04 9.90000e+04 3.50000e+05 1.00000e+06 2.00000e+03 6.19610e+04
 5.10000e+04 1.70000e+05 2.40000e+04 1.33000e+05 4.66560e+04 5.30000e+05
 2.20000e+04 1.55000e+05 1.00000e+03 3.80000e+04 7.10000e+04 2.60000e+04
 3.70000e+05 1.53000e+05 2.54739e+05 3.28200e+03 4.83870e+04 4.79700e+04
```

```
 8.00000e+04 4.70000e+04 2.04530e+04 6.20000e+04 2.28490e+04 1.99600e+03
 1.40000e+04 9.00000e+03 2.20000e+05 2.00590e+04 5.40000e+04 7.40000e+04
 1.97340e+04 3.20000e+05 1.71130e+04 6.04000e+04 2.00790e+04 6.10000e+04
 3.16570e+04 1.14000e+05 5.00000e+00 2.22600e+03 1.95580e+04 2.45410e+04
 2.62790e+04 1.94000e+05 1.23910e+04 8.67850e+04 2.68780e+04 3.11200e+03
 1.01000e+05 9.20000e+04 7.70000e+04 1.87000e+05 1.90000e+05 5.00000e+05
 1.03000e+04 1.70000e+03 3.40000e+04 2.65450e+04 3.90000e+04 2.95000e+05
 2.47000e+05 1.80000e+05 2.80000e+04 3.40000e+05 8.50000e+04 5.37000e+03
 1.25000e+05 8.70040e+04 2.68160e+04 8.88400e+03 6.90000e+04 2.67270e+04
 9.50000e+04 1.09348e+05 7.42600e+03 2.30000e+05 1.17000e+05 1.90000e+04
 1.37000e+05 1.60000e+04 6.70000e+04 8.00000e+05 4.20000e+04 4.10000e+05
 8.68500e+04 3.27390e+04 2.70150e+04 3.44271e+05 2.90000e+04 1.23870e+04
 1.65000e+05 9.70000e+04 1.79000e+05 1.36000e+05 3.72410e+04 1.85400e+04
 1.66540e+04 9.10000e+04 3.57000e+04 4.97500e+03 6.62400e+03 3.31580e+05
 6.14800e+03 9.40000e+03 3.68430e+04 1.19671e+05 3.33920e+04 1.07400e+04
 2.85990e+04 9.82000e+02 2.05000e+05 2.58780e+04 1.90500e+04 7.33840e+04
 1.30000e+04 1.26000e+05 3.10000e+04 2.10000e+04 1.35320e+04 1.13410e+04
 4.30000e+04 4.90000e+04 1.35000e+05 4.30920e+04 5.90000e+04 1.57000e+05
 7.20000e+04 2.50320e+04 1.11350e+04 1.22000e+05 1.34954e+05 1.56170e+04
 6.71260e+04 1.04000e+05 4.60000e+04 4.80000e+05 1.39113e+05 5.45900e+03
 5.22000e+03 1.32921e+05 2.35000e+05 5.28900e+04 1.66930e+04 2.59810e+04
 1.63554e+05 1.27829e+05 1.21149e+05 8.70000e+01 1.83160e+04 3.00400e+03
 5.20000e+04 2.85000e+05 3.25700e+03 2.35000e+04 2.64180e+04 3.25000e+05
 4.57000e+02 1.51430e+04 7.35290e+04 4.28000e+05 1.57670e+04 1.38820e+04
 1.19000e+05 4.64800e+03 6.87300e+03 1.04800e+04 1.76830e+04 1.33900e+03
 1.50000e+03 1.68000e+05 3.97000e+05 1.80440e+04 1.51399e+05 9.19700e+03
 7.90000e+01 1.13960e+04 3.30000e+04 1.23060e+04 2.30000e+04 7.55980e+04
 4.17390e+04 1.07000e+05 4.65000e+05 2.23190e+04 2.40000e+05 9.60000e+04
 1.33200e+03 1.98470e+04 7.80000e+04 2.31630e+04 1.24000e+02 6.80000e+04
 1.77860e+04 5.50000e+03 9.40000e+04 1.85910e+04 6.84800e+04 4.50000e+03
 1.44000e+05 1.95290e+04 4.54150e+04 1.44596e+05 5.19530e+04 8.76860e+04
 1.69900e+03 7.38800e+03 6.37000e+03 1.95000e+04 3.02570e+04 2.29000e+02
 8.70000e+04 8.10000e+04 2.10000e+05 1.75000e+05 9.10420e+04 2.19880e+05
 1.85000e+05 3.54350e+04 1.15000e+05 2.37000e+05 2.14000e+05 5.95070e+04
 6.66110e+04 1.60230e+04 1.21000e+05 4.57000e+05 8.10230e+04 2.15680e+04
 3.50000e+03 4.70000e+05 1.84590e+04 4.26590e+04 1.29000e+05 4.45739e+05
 1.38000e+05 5.60000e+04]

FacAN_T07 = [0.00000e+00 8.00000e+04          nan 4.20000e+05 8.06700e+03
4.00000e+04
 2.50000e+05 8.50000e+04 6.00000e+04 7.00000e+04 2.50000e+04 9.52150e+04
 1.30000e+05 1.18000e+05 2.95400e+04 4.70000e+04 3.60000e+04 5.10000e+04
 1.67000e+05 6.50000e+04 3.40000e+04 2.90000e+04 5.19740e+04 2.00000e+04
 1.00000e+05 3.50000e+04 2.00000e+05 5.00000e+04 3.00000e+05 8.53900e+03
 1.70600e+03 1.12000e+05 4.10000e+04 1.00000e+04 1.70000e+05 1.85000e+05
 8.00000e+03 1.70000e+04 1.50000e+05 1.40014e+05 3.65816e+05 7.00000e+03
 1.20000e+05 9.41220e+04 9.70000e+04 7.90000e+04 1.96000e+05 5.20000e+04
 5.00000e+03 5.70000e+04 4.20000e+04 6.70000e+04 4.93920e+04 1.80000e+05
```

```
 4.30000e+04 3.00000e+04 4.00000e+05 1.15000e+05 1.37000e+05 1.07000e+05
 1.22500e+03 7.40000e+04 9.00000e+04 6.21990e+04 2.52000e+04 1.82000e+05
 5.50000e+05 1.10000e+05 2.20000e+04 3.80000e+05 1.40000e+04 8.40000e+04
 1.50000e+04 2.02500e+03 6.60000e+04 2.10000e+05 1.76150e+04 1.37900e+04
 1.57000e+05 1.95000e+05 1.33939e+05 6.50000e+05 2.82000e+05 6.89400e+03
 2.70000e+04 1.31900e+04 1.35000e+05 7.50000e+04 3.70000e+04 1.89000e+05
 3.50369e+05 1.60000e+05 6.56590e+04 1.20000e+04 2.40000e+04 4.49600e+03
 1.20940e+04 3.30000e+04 1.01180e+04 8.60000e+04 9.00000e+05 5.50000e+04
 8.43000e+03 4.08310e+04 2.12700e+04 4.80000e+05 8.65610e+04 1.25920e+04
 8.22940e+04 7.10000e+04 2.27600e+03 2.64910e+04 1.17000e+05 1.49000e+05
 3.03000e+05 2.05000e+05 1.22000e+05 6.20000e+04 4.12850e+04 5.40000e+04
 1.05000e+05 4.51000e+05 1.45000e+05 1.54000e+05 9.50000e+04 1.44000e+05
 5.30000e+04 3.20000e+05 8.25000e+05 1.75040e+04 1.60000e+04 8.70000e+04
 3.29770e+04 4.72138e+05 1.35094e+05 7.85000e+05 4.61000e+03 6.81000e+05
 4.50000e+05 2.80700e+04 6.30000e+04 4.40000e+04 1.14000e+05 4.35958e+05
 9.00000e+03 5.39700e+04 6.43700e+03 1.80000e+04 1.14000e+06 1.54162e+05
 1.90000e+01 1.40000e+05 3.23500e+03 2.54390e+04 1.42000e+05 1.30000e+04
 6.72700e+03 2.61000e+05 2.49200e+03 4.32500e+03 7.70000e+04 4.36970e+04
 3.20000e+04 9.80000e+04 3.10000e+04 1.51320e+04 2.83570e+05 2.30000e+04
 6.10000e+04 1.31420e+04 8.41290e+04 1.90000e+05 6.40000e+04 7.20000e+04
 2.00600e+03 2.80000e+05 1.40270e+04 1.98000e+02 6.39900e+03 3.90000e+04
 1.43691e+05 2.20000e+05 4.50420e+04 2.54000e+03 1.35540e+04 1.19000e+05
 2.33450e+04 3.93900e+04 5.60000e+04 7.88840e+04 9.75870e+04 1.48000e+02
 5.80000e+04 2.60000e+04 2.10000e+04 6.00000e+03 3.51400e+03 1.05280e+04
 1.90000e+04 5.11200e+04 1.52001e+05 6.89700e+03 4.85200e+03 1.73760e+04
 3.54000e+05 4.59510e+04 7.90050e+04 6.00000e+02 1.50171e+05 2.28420e+04
 1.11360e+04 6.49600e+03 3.40950e+04 3.08800e+03 5.00000e+05 2.85260e+04
 8.42000e+03 1.09005e+05 6.87800e+03 3.53542e+05 2.20000e+03 9.00120e+04
 4.60000e+04 4.47000e+02 2.00000e+03 4.30000e+03 4.27300e+03 1.00000e+03
 1.54800e+04 4.50000e+04 1.08110e+04 2.80000e+04 2.18000e+05 7.45400e+03
 6.90000e+04 2.06000e+05 8.20000e+04 3.37000e+03 3.00000e+03 1.72000e+05
 3.80000e+04 1.91896e+05 8.21100e+03 4.01980e+04 2.15000e+05 6.27600e+03
 1.16910e+04 4.02220e+04 1.99000e+03 2.08000e+02 2.34360e+04 1.26000e+05
 1.47100e+03 5.33920e+04 3.46000e+02 3.34400e+04 3.18000e+02 2.89850e+04
 1.42900e+03 1.10000e+04 5.66100e+03 7.20000e+03 2.84300e+04 7.60000e+04
 1.58527e+05 1.87000e+05 8.90000e+04 2.00000e+00 7.80000e+04 1.51990e+04
 6.60000e+03 1.21579e+05 1.25700e+04 1.45000e+04 1.00119e+05 7.80670e+04
 5.86173e+05 1.75000e+05 1.38000e+05 4.77000e+05 4.05200e+03 6.95000e+05
 2.70000e+05 3.95900e+03 1.25000e+05 1.03830e+04 1.24000e+05 2.00080e+04
 1.01000e+05 3.40770e+04 3.70000e+05 1.06216e+05 2.84000e+05 2.07000e+05
 6.15000e+05 4.69220e+04 7.50000e+05 5.01700e+04 2.31924e+05 6.82490e+04
 2.85000e+05 1.06000e+05 1.00000e+06]

FacAN_T08 = [0.00000e+00 9.70000e+04         nan 6.00000e+04 5.00000e+04
2.00000e+05
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 2.00000e+04 1.00000e+05 7.40000e+04 1.00000e+04 2.90000e+04 1.60000e+05
 2.50000e+04 4.00000e+04 7.00000e+05 1.30000e+05 1.70000e+04 7.00000e+04
```

```
 3.70000e+04 2.50000e+05 1.22000e+05 2.60000e+05 5.40000e+04 1.20000e+04
 3.00000e+05 1.73000e+05 4.74990e+04 6.50000e+04 8.80000e+04 9.10000e+04
 2.30000e+05 1.10000e+04 9.00000e+03 6.20000e+04 1.50000e+05 6.00920e+04
 4.50000e+05 2.60000e+04 5.00000e+05 1.50000e+04 4.27240e+05 4.30000e+04
 8.40000e+04 1.90000e+05 1.93000e+05 1.55000e+05 9.00510e+04 2.53000e+05
 5.00000e+03 4.00000e+05 8.70000e+04 1.42500e+04 4.70000e+04 5.03000e+05
 1.07000e+05 2.07000e+05 8.00000e+04 7.70000e+04 1.40000e+04 6.57090e+04
 6.00000e+03 1.62870e+05 1.44000e+05 9.00000e+04 1.73090e+04 1.65000e+05
 8.50000e+03 3.50000e+04 1.10750e+04 2.10000e+04 1.84739e+05 4.35000e+03
 7.50000e+04 3.97190e+04 2.81500e+03 1.27000e+05 1.43180e+04 4.50000e+04
 1.20000e+05 4.65000e+03 1.51000e+05 1.80000e+05 2.11890e+04 2.70000e+04
 2.04382e+05 5.90520e+04 5.50000e+05 2.12000e+03 1.53310e+04 2.19000e+05
 3.25140e+04 1.40000e+05 3.07600e+04 5.70000e+04 3.40000e+04 3.50000e+05
 4.78530e+04 9.99500e+03 2.71460e+04 9.99800e+04 2.30000e+04 6.80160e+04
 6.64580e+04 3.67000e+05 4.20200e+03 8.50000e+04 3.30000e+04 5.61420e+04
 2.10000e+05 6.60000e+04 2.40000e+05 6.70000e+04 5.57220e+04 1.46293e+05
 1.64000e+05 6.30000e+04 6.40000e+04 2.80000e+05 5.90000e+04 2.38055e+05
 1.67900e+05 3.08660e+04 4.60000e+05 4.96300e+03 7.41750e+04 2.82860e+04
 9.51700e+03 5.79350e+04 6.36260e+04 2.01600e+05 5.30000e+04 1.21629e+05
 9.44800e+04 1.05000e+05 1.65000e+03 2.95186e+05 1.78060e+04 1.49100e+03
 5.32200e+03 4.80000e+05 1.10000e+05 2.40000e+04 3.20000e+01 4.76220e+04
 3.00000e+03 2.78100e+03 5.50000e+04 1.92219e+05 1.47000e+05 1.25000e+05
 1.24879e+05 4.29200e+03 4.10000e+04 1.99900e+04 1.50450e+04 1.54430e+04
 4.82400e+03 1.38668e+05 9.60000e+04 4.76400e+03 3.20000e+05 1.61995e+05
 1.77000e+05 3.60000e+04 1.41000e+05 5.12300e+03 1.25280e+04 8.89900e+03
 1.16300e+03 2.90000e+05 1.80000e+04 1.23000e+05 1.50590e+04 2.08000e+05
 1.03700e+03 4.91510e+04 2.00000e+03 9.58500e+03 1.03000e+05 7.60000e+04
 1.70000e+05 9.80000e+04 5.10000e+04 1.90000e+04 1.81470e+04 1.20180e+04
 1.71000e+05 2.17620e+04 6.93300e+03 2.37490e+04 1.72140e+04 4.00000e+03
 1.59200e+03 2.70500e+04 4.99000e+03 1.45340e+04 4.91000e+05 3.40965e+05
 1.12000e+05 6.14100e+03 1.75000e+03 1.00000e+03 3.33160e+04 1.67000e+05
 1.66680e+04 3.18900e+03 8.20000e+04 1.29000e+05 2.39980e+04 1.28370e+04
 1.89000e+04 5.94100e+03 2.85000e+04 9.20700e+03 6.50000e+05 5.60000e+04
 2.52400e+03 1.56660e+04 1.59930e+04 2.05070e+04 2.22270e+04 4.89800e+04
 2.80000e+04 1.23900e+03 6.02700e+03 8.00000e+03 1.49000e+03 6.10000e+04
 5.20000e+04 3.82900e+03 1.02000e+05 2.87000e+05 1.96338e+05 1.14000e+05
 2.37480e+04 3.20000e+04 1.51000e+03 1.37900e+04 6.62000e+02 5.00000e+00
 5.66500e+03 9.23500e+03 1.15000e+04 1.30000e+04 9.30000e+04 2.67270e+04
 6.90000e+04 1.96000e+04 2.40010e+04 2.36600e+03 4.57620e+04 2.61600e+03
 9.20000e+04 2.54460e+04 2.44600e+04 3.58240e+04 1.97320e+04 3.10000e+04
 5.80000e+04 2.18760e+04 1.00329e+05 6.73300e+03 1.73690e+04 4.20000e+04
 1.17000e+05 1.28250e+06 2.25000e+05 1.92175e+05 3.30000e+05 1.34911e+05
 2.10396e+05 1.68000e+05 6.99990e+05 9.50000e+04 3.73000e+05 2.58000e+05
 3.10000e+05 1.16000e+05 5.53870e+04 3.70000e+05 1.15000e+05 8.78200e+03
 1.17945e+05 2.77450e+04 8.11000e+03 2.10531e+05 1.11000e+05 3.26860e+04]

FacAN_T09 = [0.00000e+00         nan 3.20000e+04 5.00000e+04 1.05000e+05
1.00000e+05
```

```
 9.00000e+04 6.00000e+04 2.00000e+04 1.70000e+04 2.33960e+04 3.70000e+04
 6.30640e+04 1.15000e+05 1.00000e+04 7.00000e+03 2.40000e+04 7.00000e+04
 2.20000e+05 4.00000e+04 1.84001e+05 5.50000e+04 1.40000e+04 2.17000e+05
 1.50000e+05 2.72000e+05 3.40000e+05 1.46340e+04 2.00000e+05 3.00000e+04
 1.30000e+05 7.40000e+04 1.20000e+05 1.70000e+05 1.43600e+04 1.60000e+05
 2.50000e+04 2.90000e+04 2.40000e+05 1.80000e+05 6.50000e+04 3.00000e+05
 1.90000e+05 2.50000e+05 1.80000e+04 9.30000e+04 4.70000e+04 2.30000e+05
 2.15000e+05 1.10000e+05 1.88090e+05 1.50000e+04 1.60020e+05 5.40000e+04
 2.70000e+04 2.60000e+04 2.08100e+04 1.27000e+05 2.55880e+04 9.00000e+03
 5.00000e+03 1.87000e+05 8.50000e+04 7.70000e+04 1.27988e+05 3.77440e+04
 4.10000e+04 1.85000e+05 1.32000e+05 1.92950e+04 7.20000e+04 1.53000e+05
 9.10000e+04 4.60000e+05 1.63000e+05 6.70000e+04 1.71000e+04 3.56210e+04
 6.40000e+04 7.50000e+04 1.62000e+05 1.99000e+05 1.20000e+04 9.50000e+04
 4.22820e+04 1.55000e+05 1.93460e+04 3.46000e+03 2.10000e+05 1.84000e+05
 8.70000e+04 1.45000e+05 4.23230e+04 2.10000e+04 4.00000e+05 2.70000e+05
 3.50000e+04 3.09610e+04 3.05050e+04 2.07000e+05 1.07466e+05 2.20000e+04
 1.12564e+05 1.40000e+05 5.00000e+05 3.93000e+05 1.87360e+04 2.36610e+04
 8.60000e+04 1.16790e+04 4.20000e+04 8.00000e+04 3.70980e+04 5.56000e+04
 9.70000e+04 1.59000e+05 7.20000e+03 3.40000e+04 1.35000e+04 7.80000e+05
 3.50000e+05 1.11000e+05 3.55000e+04 7.61070e+04 1.55008e+05 4.07920e+04
 1.26590e+04 2.86672e+05 1.00000e+06 4.50000e+04 4.40000e+04 1.28000e+05
 3.60000e+04 2.73220e+04 5.70000e+04 5.05000e+04 5.20000e+04 9.18530e+04
 2.80000e+04 1.28740e+04 1.90000e+04 2.09470e+04 1.44000e+05 5.05500e+04
 6.75000e+03 4.82300e+04 1.02000e+05 1.00996e+05 2.17759e+05 4.66500e+04
 3.60100e+03 3.10000e+04 5.10000e+04 1.10000e+04 1.41620e+05 9.61400e+03
 1.58000e+03 9.80000e+04 2.57400e+03 6.70000e+05 5.90000e+04 2.64000e+05
 4.63000e+03 1.60000e+04 1.52000e+03 2.60300e+03 4.50000e+05 1.04000e+05
 1.18000e+05 9.36100e+03 7.40600e+04 1.27792e+05 3.41450e+04 2.44300e+04
 2.60500e+03 1.41820e+04 9.20000e+04 1.00000e+03 7.30000e+04 3.03000e+04
 1.02520e+04 3.04770e+04 4.25400e+03 4.00000e+03 3.80000e+04 2.08040e+04
 7.10000e+04 2.37000e+03 2.77340e+04 8.40000e+04 1.34000e+05 1.30000e+04
 2.38100e+03 2.63600e+04 2.77710e+04 3.82540e+04 2.52200e+04 1.67000e+05
 5.69290e+04 1.03420e+04 5.60000e+05 4.12420e+04 9.40200e+03 4.30000e+04
 6.50000e+05 6.87000e+02 1.13280e+04 4.90000e+04 1.08000e+05 4.50850e+04
 7.97570e+04 1.12600e+05 1.29248e+05 2.00000e+03 5.77770e+04 6.00000e+05
 8.00000e+03 2.00000e+02 8.80000e+04 6.00000e+03 1.55910e+04 2.36000e+03
 2.13900e+04 5.03500e+03 5.46900e+03 5.54170e+04 2.50980e+04 3.50000e+03
 2.29000e+04 3.30000e+04 1.10854e+05 6.30000e+04 1.74800e+03 4.65480e+04
 6.82870e+04 2.65620e+04 3.00000e+03 4.70000e+05 3.31670e+04 2.55000e+03
 4.97700e+03 1.91110e+04 3.05320e+04 2.23000e+03 7.49400e+03 2.23000e+05
 1.80000e+03 5.20000e+05 1.00000e+00 2.05000e+04 9.68800e+03 1.20180e+04
 2.50000e+03 1.11310e+04 3.25000e+04 7.64700e+03 1.99900e+04 6.07160e+04
 4.66560e+04 2.81370e+04 8.20000e+04 5.90400e+03 5.50000e+05 1.69620e+04
 4.00000e+01 2.63500e+04 1.25000e+04 4.31400e+03 1.67900e+03 6.10000e+04
 1.10110e+05 7.19600e+03 2.87000e+05 1.74000e+05 1.59568e+05 9.62560e+04
 4.76040e+04 9.60000e+04 4.48000e+05 1.63922e+05 1.00500e+05 4.74000e+05]

FacAN_T10 = [0.00000e+00         nan 8.45670e+04 7.70000e+04 1.16810e+04
```

```
5.00000e+04
 6.00000e+05 8.00000e+04 7.50000e+04 3.70000e+04 1.70000e+04 1.00000e+05
 1.90000e+05 4.00000e+04 1.50000e+05 7.00000e+03 2.80000e+05 2.00000e+05
 6.00000e+04 1.75000e+05 3.00000e+04 1.74500e+05 8.44320e+04 8.70000e+04
 6.67350e+04 1.04582e+05 9.17300e+03 1.00000e+04 1.16239e+05 2.30000e+05
 2.07338e+05 1.40000e+04 1.58403e+05 2.80000e+04 7.10000e+04 1.35000e+05
 4.10000e+04 9.50000e+04 1.00000e+06 3.23620e+04 1.36500e+05 2.40000e+05
 5.70000e+04 2.50000e+04 2.50000e+05 2.04542e+05 1.11626e+05 6.36640e+04
 5.50000e+04 6.50000e+04 1.09682e+05 2.00000e+04 9.00000e+04 5.00000e+03
 1.07356e+05 1.20000e+05 1.24708e+05 1.70000e+06 3.90000e+04 1.70000e+05
 1.72000e+05 5.60000e+04 1.83850e+04 1.30000e+05 1.64000e+05 1.62000e+05
 4.00000e+05 3.21940e+04 3.00000e+05 1.46000e+05 2.10000e+04 2.60680e+04
 4.50000e+04 1.20000e+04 6.70000e+04 4.20000e+04 5.00000e+05 9.70000e+05
 3.10000e+04 7.00000e+04 4.40000e+04 1.10000e+05 3.50000e+04 3.50000e+05
 1.50000e+04 3.40000e+05 2.90000e+04 1.80000e+05 2.60000e+04 9.99850e+04
 8.00000e+03 2.37000e+05 4.05400e+03 1.83500e+05 9.40000e+04 5.73100e+03
 1.40000e+05 2.29010e+04 5.57500e+04 1.45000e+05 3.29740e+04 3.40000e+04
 2.87180e+04 2.96000e+05 8.00000e+05 9.70000e+04 1.08000e+05 2.40000e+04
 2.11588e+05 1.05890e+04 5.50000e+03 2.20000e+04 6.00000e+03 5.30000e+04
 1.63198e+05 1.04118e+05 5.20000e+05 2.86800e+04 2.41560e+04 3.30000e+04
 8.60000e+04 4.00000e+03 8.80000e+04 2.64500e+05 1.20600e+04 1.80000e+04
 1.60000e+05 5.01700e+03 3.36320e+04 1.10000e+04 1.21943e+05 9.17550e+04
 2.15000e+05 1.16600e+04 1.27230e+04 7.80000e+04 6.10000e+03 4.60000e+04
 1.38749e+05 3.37870e+04 5.20000e+04 2.00000e+03 2.39210e+04 2.27000e+03
 4.30000e+04 4.70000e+04 2.70000e+04 2.30000e+04 1.25000e+05 3.00000e+02
 7.74000e+02 1.45920e+04 6.76310e+04 1.99630e+04 4.90000e+04 1.30000e+04
 3.10240e+04 2.65100e+05 3.60000e+04 3.56300e+03 3.20000e+04 1.97000e+05
 1.70558e+05 5.40000e+04 8.50000e+04 2.98360e+04 3.96300e+03 1.05000e+05
 7.20000e+04 8.10000e+04 7.46190e+04 6.10000e+04 8.10010e+04 4.59800e+03
 3.77000e+05 1.06700e+03 1.37210e+04 9.54000e+03 5.71000e+02 1.73600e+03
 8.46000e+03 1.07010e+04 1.47000e+05 2.45000e+05 6.20000e+04 1.63000e+03
 5.62580e+04 1.09232e+05 3.47190e+04 9.77500e+03 8.90000e+04 3.35450e+04
 6.30000e+04 1.40710e+04 3.51000e+05 1.61940e+04 7.11700e+03 1.35240e+04
 3.66090e+04 1.00000e+03 9.77900e+03 6.60000e+04 8.17800e+03 9.90000e+04
 1.90000e+04 1.27650e+05 3.04690e+04 8.56600e+04 5.57700e+03 5.32240e+04
 5.81520e+04 6.34470e+04 1.96870e+04 1.03640e+04 1.65000e+05 1.60000e+04
 7.40000e+04 7.00000e+00 5.90000e+04 4.36000e+03 1.34000e+05 2.92180e+04
 5.62100e+04 3.79150e+04 3.80000e+04 1.27440e+04 1.02000e+05 4.08900e+05
 1.11000e+05]

FacAN_T11 = [0.00000e+00         nan 6.00000e+04 4.00000e+04 1.93100e+04
5.00000e+03
 3.70000e+04 2.00000e+05 1.00000e+05 7.00000e+03 3.00000e+04 3.00000e+05
 5.00000e+05 1.70000e+04 1.40000e+04 3.40000e+04 3.50000e+04 5.90000e+05
 9.00000e+04 1.20050e+05 2.00000e+04 2.50000e+04 5.00000e+04 4.40000e+04
 5.70000e+04 7.40000e+04 7.50000e+04 3.19810e+04 1.32080e+04 2.50000e+05
 8.10000e+04 3.90000e+04 4.20000e+04 7.00000e+04 6.56310e+04 2.91000e+05
 1.20000e+06 7.63510e+04 5.40140e+04 2.02010e+04 1.50000e+05 1.52285e+05
```

```
 3.08000e+05 1.00000e+06 6.00000e+05 7.29940e+04 2.65350e+04 1.20000e+05
 2.40000e+04 4.90000e+04 3.20000e+04 1.80000e+03 1.00000e+04 1.25000e+05
 3.27000e+05 5.40000e+04 1.10000e+05 1.58000e+05 4.70000e+04 4.50000e+05
 9.00000e+03 2.52480e+04 1.07000e+05 1.90000e+05 1.50000e+04 1.37350e+04
 1.30000e+05 1.00000e+03 1.71779e+05 4.00000e+05 3.61070e+04 1.80000e+05
 5.20000e+04 8.50000e+04 8.00000e+04 1.40000e+05 1.60000e+05 6.70000e+04
 1.01000e+05 1.80000e+04 2.97000e+05 1.19900e+04 3.10000e+04 3.76170e+04
 3.34600e+05 2.30000e+05 8.50900e+03 2.22925e+05 1.20000e+04 3.20300e+04
 8.09600e+04 4.00000e+03 1.40980e+04 2.80000e+05 4.57390e+04 5.25500e+03
 5.92900e+03 3.74600e+03 1.60000e+02 6.00000e+03 7.90000e+04 2.30000e+04
 9.93800e+03 1.55000e+05 6.50000e+04 6.51920e+04 5.50000e+04 1.43334e+05
 8.60000e+05 2.25000e+05 1.70000e+05 1.35000e+05 3.71000e+05 6.10000e+04
 2.70000e+05 9.60000e+04 8.70000e+04 1.53793e+05 2.86000e+04 1.10000e+04
 2.00000e+06 3.20000e+05 2.20000e+04 1.77000e+05 2.98000e+05 3.82115e+05
 1.10550e+04 1.79000e+02 7.05000e+03 7.10000e+04 1.31000e+05 3.29000e+05
 1.11000e+05 8.90000e+04 8.60000e+04 9.78100e+03 2.59920e+04 4.50000e+04
 3.10000e+05 6.60000e+04 1.97000e+05 2.68380e+04 1.14000e+05 6.11130e+04
 5.59000e+05 3.99000e+05 1.50920e+04 1.99900e+04 6.90000e+04 1.61480e+04
 5.50000e+05 7.28880e+04 1.32710e+04 8.00000e+03 3.19750e+04 2.20000e+05
 4.91120e+04 6.77400e+03 7.85400e+03 1.24400e+03 6.05000e+04 3.74080e+04
 2.60000e+04 7.20000e+04 2.15000e+05 3.18810e+04 3.80000e+04 2.80000e+04
 2.70000e+04 7.80000e+03 2.88560e+04 9.40000e+04 2.10000e+04 6.88130e+04
 7.70000e+04 4.10000e+04 1.05000e+06 5.17960e+04 1.24000e+04 2.90000e+04
 4.72500e+03 3.54260e+04 4.35980e+04 2.28710e+04 3.50000e+03 4.80000e+04
 9.10700e+03 2.36129e+05 1.60000e+03 3.80000e+03 1.60000e+04 1.45420e+05
 2.24110e+05 2.00000e+03 2.90160e+04 9.07300e+03 1.99408e+05 5.60000e+04
 2.80080e+04 8.30000e+04 9.90000e+04 5.44800e+03 1.00000e+00 9.30000e+04
 3.00000e+03 6.67000e+02 1.24000e+05 6.20000e+04 3.52480e+04 5.22430e+04
 4.99400e+03 4.55600e+04 3.06000e+04 1.90550e+04 1.57000e+05 2.90280e+04
 1.46290e+04 5.77590e+04 4.38530e+04 1.27000e+05 1.58070e+04 1.43000e+05
 2.10000e+05 1.30000e+04 4.58000e+02 1.27410e+04 3.41940e+04 8.62400e+03
 7.47000e+03 3.53620e+04 3.91600e+03 1.26000e+05 1.82690e+05 6.57600e+03
 8.51700e+03 1.21220e+04 2.72900e+04 1.60000e+01 3.60000e+04 1.18750e+04
 6.56200e+03 5.10000e+04 5.06700e+03 1.18819e+05 1.21600e+04 9.50000e+04
 4.49700e+03 8.40000e+04 9.42800e+03 1.68000e+05 1.02000e+05 1.52000e+02
 1.26210e+04 3.56300e+03 6.99870e+04 4.30000e+04 9.70000e+04 2.05800e+03
 8.00000e+05 7.96733e+05 1.05000e+05 3.71010e+04 2.90000e+05 1.37000e+05
 1.56800e+03 2.00100e+04 6.26500e+03 8.86800e+03 6.41730e+04 9.25500e+03
 7.19830e+04 9.27200e+03 4.04200e+03 4.64580e+04 1.95000e+05 7.30000e+04
 4.90000e+05]

FacAN_T12 = [0.00000e+00         nan 2.00000e+05 5.20000e+05 1.70000e+04
1.80000e+05
 2.61000e+05 7.00000e+03 1.00000e+04 5.00000e+04 2.00000e+04 3.24000e+05
 1.85000e+05 3.00000e+05 6.40000e+04 2.10000e+04 1.40000e+04 1.64370e+04
 9.95000e+04 7.80000e+04 3.40000e+04 8.82300e+03 3.50469e+05 3.33360e+04
 4.00000e+04 4.48380e+04 7.00000e+04 1.31000e+06 3.00000e+04 2.60000e+05
 5.00000e+03 1.13568e+05 1.40000e+05 8.00000e+04 1.80000e+04 1.00000e+05
```

```
 4.84000e+05 1.50000e+04 3.70000e+04 3.95000e+05 2.81000e+05 2.80000e+05
 7.10000e+04 3.61000e+05 2.50000e+05 7.40000e+04 3.62960e+04 5.80000e+04
 8.00000e+03 1.17000e+05 5.30000e+04 1.90000e+05 6.70000e+04 1.30000e+05
 3.20000e+05 9.20000e+04 1.00206e+05 1.10000e+04 5.99943e+05 1.10000e+05
 2.23385e+05 2.65046e+05 1.52790e+05 1.21000e+05 4.00000e+03 1.25000e+05
 6.00000e+04 3.50000e+04 1.50000e+05 2.60000e+04 1.75000e+05 9.50000e+04
 4.22188e+05 8.07810e+04 2.90380e+05 1.00000e+02 9.35000e+04 5.70000e+04
 3.50000e+05 1.05000e+05 1.37591e+05 2.78270e+04 1.70000e+05 2.90000e+05
 1.23380e+04 2.50000e+04 2.04000e+05 6.00000e+05 3.00020e+04 1.45000e+05
 5.90000e+04 3.00000e+03 2.86020e+04 1.20000e+04 4.10000e+04 4.70000e+04
 5.10000e+04 1.34000e+05 7.70000e+04 3.09000e+04 2.40000e+04 4.20000e+04
 4.00000e+05 7.60300e+03 7.50000e+04 5.00000e+05 3.42000e+05 2.54530e+04
 3.20000e+04 7.80000e+05 7.59980e+04 1.33000e+05 5.40000e+04 1.18596e+05
 2.36675e+05 4.50000e+04 1.56000e+05 2.20000e+05 1.97000e+05 2.74280e+04
 3.24150e+04 6.10000e+04 2.57190e+04 7.00310e+04 4.50000e+05 1.99500e+03
 3.79870e+04 9.13920e+04 1.00000e+03 1.65000e+05 6.87700e+03 8.50000e+04
 4.30000e+04 1.43040e+04 8.37800e+04 9.85000e+04 3.52600e+03 2.30000e+04
 5.99900e+04 1.45700e+04 1.20000e+05 6.08500e+03 1.16970e+04 1.13000e+05
 3.90000e+04 1.26930e+05 1.37000e+05 1.21440e+04 2.70000e+04 8.90000e+04
 3.55670e+04 9.00000e+04 2.99999e+05 9.90000e+04 7.59300e+03 1.58660e+04
 1.99200e+03 2.20000e+04 5.54230e+04 2.13040e+04 1.21540e+04 2.10000e+05
 2.35160e+04 1.16130e+04 1.07000e+05 1.27200e+03 7.85220e+04 8.78300e+03
 9.10000e+04 1.17530e+04 1.90000e+04 1.59900e+04 3.10000e+04 3.52000e+05
 1.45000e+02 1.42000e+05 5.20000e+04 1.60000e+05 2.10090e+04 5.50000e+04
 1.30000e+04 6.00000e+03 2.24000e+05 6.95000e+03 2.90000e+04 6.50000e+04
 8.30000e+04 1.82200e+04 2.58070e+04 4.19100e+03 5.62600e+03 6.20000e+04
 2.50000e+03 1.60000e+04 7.20000e+04 1.54700e+06 1.09000e+05 1.91000e+05
 3.00000e+00 1.06700e+05 3.02000e+04 4.51550e+04 4.99900e+03 3.10000e+05
 8.13700e+03 8.70000e+04 9.53160e+04 3.20000e+03 1.08230e+04 3.93600e+03
 4.84600e+03 2.25000e+03 2.00000e+03 6.01600e+03 2.31000e+05 1.11004e+05
 1.91960e+04 2.07000e+05 1.37880e+04 2.30870e+04 1.73620e+04 7.18900e+03
 1.24810e+04 1.18841e+05 2.88000e+03 7.49000e+02 1.35000e+05 2.89630e+04
 9.80000e+04 4.29200e+03 1.99470e+04 5.91600e+03 4.00000e+02 1.00000e+06
 2.02000e+05 8.87390e+04 9.60000e+05 2.19220e+04 7.06600e+03 9.70000e+04
 3.74000e+05 4.40000e+04 4.58370e+04 3.44900e+04 8.40500e+03 7.00000e+05
 2.24000e+04 1.29500e+03 8.80010e+04 2.01000e+05 4.57530e+04 2.71000e+05
 9.22000e+04 1.20050e+04 1.14000e+05]

FacAI_T01 = [      0   43125   14241  179205   34327   71017   20423   27654
164937
  121368   51923   79119  353904  210836  112586   68728  240083  678725
  316476  121274  458695   49571  182660   81361  142356  154820  212704
  171657  160153  193857 1022866  181831   34649  263044  352950  582854
   55510   30661   85881  479155  709013   53537  205351   14352  178055
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```

```
FacAI_T10 = [      0.              nan  269110.       52110.4604   58692.891
   20091.7526   54629.33    703249.0164  584286.2498   26324.3402
   52137.3714  213737.9264    6948.4202  246483.2312  161466.
   35102.7084   10538.3476  247581.2      25226.3714   52648.6804
   95577.1076   12454.4108   19526.6216   37524.6984   34494.5198
  276887.279    78084.9576   70512.2022  204830.3854  451378.203
  183872.0986   51604.5336   36911.1276   93537.2538  322700.5654
   34806.6874   10527.5832   24720.4446   38235.1488  139059.9014
  173758.9448  411318.4884  130249.24    136998.5188   52659.4448
   95609.4008   14973.2804   75291.5958  110270.5136  215288.
  228146.0758  256542.563    62783.363    65393.73     82105.461
    8772.986    96691.223   173236.8714   26954.0576   60237.5824
  430576.      227128.84    103435.1196  228140.6936  147262.3742
  138193.3672  249734.08    139468.9486   96379.0554  151901.8306
  596154.0008   50694.9418    5263.7916   34763.6298  350348.9268
   69457.291   102800.02      5215.3518  239486.3712   10764.4
   17562.1186   20538.4752    4897.802    50205.1616  122848.715
  347281.0728  131508.6748   45867.1084  147795.212    70200.0346
   53822.       27309.2828   30603.1892   68956.7464  565389.3456
   69274.2962   54360.22     78973.0206   84500.54     26911.
   68741.4584   48655.088   102434.0304   11281.0912  175497.3954
  205384.752   149652.071   138048.0478   52605.6228  276801.1638
  238259.2296  245078.477    75883.6378  120475.1648   89688.9808
  149388.3432  107644.      325353.99    111002.4928  698012.1358
   17373.7416   62960.9756   17406.0348    5269.1738  157746.8998
  342598.5588  253442.4158  105130.5126   35097.3262  313157.9248
   69134.359  1269477.9852   44989.8098   34650.6036   30269.4928
  194566.53     33380.4044  239459.4602   75049.3968   34214.6454
  313459.328    17551.3542   88133.525   606514.7358   93052.8558]

FacAI_T11 = [     0.             nan  27485.4247  17633.4783  50792.3765
10120.8314
 199491.1592  90124.8743  42128.9018  88533.0751 141632.4849 312670.2334
 229945.0743 175205.466   35062.604  255913.9876  10755.4    341833.5005
 446558.8303 527369.5282 135577.1947 524831.2538  63623.5687 174710.7176
 484084.4209 144278.3133 159384.2726 718686.5834 430216.      17660.3668
 152683.6584 111372.167  267917.014   51303.258  241367.3091  75997.6564
  26888.5     34955.05   104762.9737 212655.7688  83332.8392  61155.2044
 120686.3434 472140.5492  26291.5753  34809.8521   8233.2587 755496.9399
  21510.8    150822.9742  69404.5962 370894.5913  60230.24    69458.3732
 247922.7254  35154.0249  68872.2039  59821.5348 134442.5     41644.9088
  49528.617  119750.6236  79589.96   366544.032  314703.004   43774.478
 108145.547  387651.5045  46006.2235  73265.7848  34879.7622 139873.977
  52491.7297 385747.7987 176560.6464  88199.6577 247621.5742  70480.1362
 249396.2152 300672.5847  34702.2981 140164.3728 148736.4266  53777.
 110479.4688 210192.7822  34600.1218 348141.5426   8819.428   83886.7423
  70824.309  227675.6849  35299.2228  12352.5769 125440.2302  70566.1794
 173957.8396  48501.4763 104623.1535  69103.445 ]
```

```
FacAI_T12 = [     0.             nan  47753.9673 625170.7959  64448.7068
18167.3288
  78214.45   198929.0139 244519.9471 241483.0688  35379.9019 128573.7676
  53941.      83959.1665 210369.9    161823.     271188.3775 229535.1373
 602758.3104   8830.1417 294102.5143 206966.2229 533913.4121 162686.056
 103717.7548  13760.3491 107882.      82696.9471  27833.556   68343.247
  75145.2071  34230.9586  17498.4604 297851.4138  99326.9574  75700.7994
 147587.9701  34452.1167 323646.     482885.2261 235290.642   64189.79
 140996.3799 150349.7493 174062.2129  60683.625   35374.5078  48573.8705
  10620.9829 165598.87   398677.931  453449.6224  21576.4     17676.4657
  79800.3154  99828.6087 137603.491  653031.3224  25638.1573  34991.5267
  72005.8409  42257.3794  60003.9684  16705.5277 101036.8871  33621.4253
 342525.35   243004.205   17671.0716   8857.1122 120007.9368  13911.3839
  38567.815   70932.415   24435.273    8760.0184  47230.7396  56837.6317
  88441.6636  10615.5888  35433.8429  17687.2539 272321.1385  88225.8996
 129458.4    247923.6242 291626.6224 138747.0402 183216.0006  60618.8958
 459949.5129  17476.884  269705.     151914.0383 104418.9878 352671.6521
 167497.5932 706966.9283  97002.1003  50348.5294  67636.6199  24710.3721
 421505.7622  14148.7243 331564.5388  38918.4315  90577.7272 100599.965 ]

target = [0 1]

IndRev_T12 = ['R' 'T' 'P' None]

IndRev_T11 = ['R' 'T' 'P' None]

IndRev_T10 = ['R' 'T' None 'P']

IndRev_T09 = ['R' 'T' 'P' None]

IndRev_T08 = ['R' 'T' 'P' None]

IndRev_T07 = ['R' 'T' 'P' None]

IndRev_T06 = ['R' 'T' 'P' None]

IndRev_T05 = ['R' 'T' 'P' None]

IndRev_T04 = ['R' 'T' 'P' None]

IndRev_T03 = ['R' 'T' 'P' None]

IndRev_T02 = ['R' 'T' 'P' None]

IndRev_T01 = ['R' 'T' 'P']
```

3.0.7 En el resultado de la celda anterior, nos pudimos percatar que al mostrar los valores únicos, hay filas que no tienen valor asignado (NaN), por lo que ahora vamos a sumar todas las filas que tienen al menos una entrada de este tipo.

[67]:
```
df_acotado.isna().any(axis=1).sum()
```

[67]:
```
19862
```

4

4.0.1 Esto nos indica que hay 19.862 filas que tienen al menos un valor en alguna de las columnas como NaN.

4.0.2 La siguiente celda nos permite revisar cómo están compuestos los datos de cada columna, nos entrega información relevante como el promedio, valor mínimo, máximo, cuartiles y el tipo de dato.

[68]:
```
for i in df_acotado:
  print(f"{i} = {df_acotado[i].describe()} \n")
```

```
Id = count    51124.000000
mean     25562.500000
std      14758.371918
min          1.000000
25%      12781.750000
50%      25562.500000
75%      38343.250000
max      51124.000000
Name: Id, dtype: float64

Edad = count    51124.000000
mean        38.702879
std         13.302573
min          9.000000
25%         28.000000
50%         35.000000
75%         46.000000
max        104.000000
Name: Edad, dtype: float64

Renta = count    3.775900e+04
mean     6.630771e+05
std      4.092795e+05
min      1.000000e+00
25%      4.199990e+05
50%      5.670120e+05
75%      8.149035e+05
max      1.308933e+07
```

```
Name: Renta, dtype: float64

Region = count    51071.000000
mean         10.828220
std           3.392703
min           1.000000
25%           9.000000
50%          13.000000
75%          13.000000
max          13.000000
Name: Region, dtype: float64

Sexo = count     51123
unique           2
top              H
freq         27410
Name: Sexo, dtype: object

TC = count    51124.000000
mean          1.732376
std           0.877470
min           1.000000
25%           1.000000
50%           2.000000
75%           2.000000
max          12.000000
Name: TC, dtype: float64

Cuentas = count    51124.000000
mean          1.407206
std           0.550357
min           1.000000
25%           1.000000
50%           1.000000
75%           2.000000
max           5.000000
Name: Cuentas, dtype: float64

Hipotecario = count    51124.000000
mean          0.137548
std           0.344428
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max           1.000000
Name: Hipotecario, dtype: float64
```

```
Consumo = count    51124.000000
mean           0.000900
std            0.029983
min            0.000000
25%            0.000000
50%            0.000000
75%            0.000000
max            1.000000
Name: Consumo, dtype: float64

Debito = count    51124.000000
mean           0.875284
std            0.330400
min            0.000000
25%            1.000000
50%            1.000000
75%            1.000000
max            1.000000
Name: Debito, dtype: float64

Ctacte = count    51124.000000
mean           0.925260
std            0.262974
min            0.000000
25%            1.000000
50%            1.000000
75%            1.000000
max            1.000000
Name: Ctacte, dtype: float64

Antiguedad = count    51124.000000
mean         38.896154
std          35.672549
min           6.000000
25%          14.000000
50%          25.000000
75%          54.000000
max         324.000000
Name: Antiguedad, dtype: float64

Dualidad = count    51124.000000
mean           0.381347
std            0.485722
min            0.000000
25%            0.000000
50%            0.000000
75%            1.000000
max            1.000000
```

```
Name: Dualidad, dtype: float64

FacCN_T01 = count    5.112400e+04
mean     5.920637e+04
std      1.175587e+05
min     -1.199000e+05
25%      0.000000e+00
50%      1.645650e+04
75%      7.346850e+04
max      2.820920e+06
Name: FacCN_T01, dtype: float64

FacCN_T02 = count    5.111200e+04
mean     6.589887e+04
std      1.257957e+05
min     -3.377790e+05
25%      0.000000e+00
50%      2.244250e+04
75%      8.314475e+04
max      5.900000e+06
Name: FacCN_T02, dtype: float64

FacCN_T03 = count    5.111400e+04
mean     6.934812e+04
std      1.332791e+05
min     -2.923440e+05
25%      0.000000e+00
50%      2.499000e+04
75%      8.856800e+04
max      9.340500e+06
Name: FacCN_T03, dtype: float64

FacCN_T04 = count    5.110500e+04
mean     6.583953e+04
std      1.202210e+05
min     -2.331900e+05
25%      0.000000e+00
50%      2.300000e+04
75%      8.397000e+04
max      4.219445e+06
Name: FacCN_T04, dtype: float64

FacCN_T05 = count    5.109900e+04
mean     5.525613e+04
std      1.058188e+05
min     -8.900000e+05
25%      0.000000e+00
50%      1.600000e+04
```

```
75%      6.958000e+04
max      2.903625e+06
Name: FacCN_T05, dtype: float64

FacCN_T06 = count    5.108100e+04
mean     6.324297e+04
std      1.201309e+05
min     -4.634800e+05
25%      0.000000e+00
50%      2.000000e+04
75%      7.840200e+04
max      3.874900e+06
Name: FacCN_T06, dtype: float64

FacCN_T07 = count    5.029100e+04
mean     6.809511e+04
std      1.179712e+05
min     -1.963660e+05
25%      0.000000e+00
50%      2.760300e+04
75%      8.930250e+04
max      3.308662e+06
Name: FacCN_T07, dtype: float64

FacCN_T08 = count    4.892400e+04
mean     5.757568e+04
std      1.090502e+05
min     -3.823700e+05
25%      0.000000e+00
50%      1.800900e+04
75%      7.187400e+04
max      2.364120e+06
Name: FacCN_T08, dtype: float64

FacCN_T09 = count    4.732400e+04
mean     5.925538e+04
std      1.140950e+05
min     -1.520000e+05
25%      0.000000e+00
50%      1.940000e+04
75%      7.431000e+04
max      4.057749e+06
Name: FacCN_T09, dtype: float64

FacCN_T10 = count    4.593300e+04
mean     5.525821e+04
std      1.092217e+05
min     -1.864970e+05
```

```
25%      0.000000e+00
50%      1.499000e+04
75%      6.636300e+04
max      2.861687e+06
Name: FacCN_T10, dtype: float64

FacCN_T11 = count    4.449200e+04
mean     5.764097e+04
std      1.106455e+05
min     -2.418286e+06
25%      0.000000e+00
50%      1.820000e+04
75%      7.140000e+04
max      2.367085e+06
Name: FacCN_T11, dtype: float64

FacCN_T12 = count    4.287300e+04
mean     5.687099e+04
std      1.104570e+05
min     -4.800000e+05
25%      0.000000e+00
50%      1.550000e+04
75%      7.114800e+04
max      3.000000e+06
Name: FacCN_T12, dtype: float64

FacCI_T01 = count    5.112400e+04
mean     5.069743e+03
std      5.244459e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      4.166432e+06
Name: FacCI_T01, dtype: float64

FacCI_T02 = count    5.111200e+04
mean     5.528803e+03
std      5.134608e+04
min     -4.556200e+04
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.299676e+06
Name: FacCI_T02, dtype: float64

FacCI_T03 = count    5.111400e+04
mean     5.252891e+03
```

```
std      4.992106e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.967445e+06
Name: FacCI_T03, dtype: float64

FacCI_T04 = count    5.110500e+04
mean     5.180115e+03
std      5.037720e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      3.923086e+06
Name: FacCI_T04, dtype: float64

FacCI_T05 = count    5.109900e+04
mean     6.163716e+03
std      4.849814e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.338298e+06
Name: FacCI_T05, dtype: float64

FacCI_T06 = count    5.108100e+04
mean     4.706476e+03
std      4.539180e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.453795e+06
Name: FacCI_T06, dtype: float64

FacCI_T07 = count    5.029100e+04
mean     3.778118e+03
std      3.724837e+04
min     -2.121400e+04
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.962278e+06
Name: FacCI_T07, dtype: float64
```

```
FacCI_T08 = count    4.892400e+04
mean     4.396519e+03
std      4.841080e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      3.574102e+06
Name: FacCI_T08, dtype: float64

FacCI_T09 = count    4.732400e+04
mean     4.631330e+03
std      4.450957e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.003492e+06
Name: FacCI_T09, dtype: float64

FacCI_T10 = count    4.593300e+04
mean     4.734170e+03
std      4.540915e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.735124e+06
Name: FacCI_T10, dtype: float64

FacCI_T11 = count    4.449200e+04
mean     4.653677e+03
std      5.290325e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      3.393667e+06
Name: FacCI_T11, dtype: float64

FacCI_T12 = count    4.287300e+04
mean     4.060128e+03
std      4.297850e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.038296e+06
```

```
Name: FacCI_T12, dtype: float64

TxsCN_T01 = count    51124.000000
mean         2.161411
std          3.521555
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         92.000000
Name: TxsCN_T01, dtype: float64

TxsCN_T02 = count    51112.000000
mean         2.371459
std          3.726697
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         94.000000
Name: TxsCN_T02, dtype: float64

TxsCN_T03 = count    51114.000000
mean         2.425911
std          3.720883
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         47.000000
Name: TxsCN_T03, dtype: float64

TxsCN_T04 = count    51105.000000
mean         2.316505
std          3.591466
min         -1.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         50.000000
Name: TxsCN_T04, dtype: float64

TxsCN_T05 = count    51099.000000
mean         2.193194
std          3.583263
min         -1.000000
25%          0.000000
50%          1.000000
```

```
75%          3.000000
max         58.000000
Name: TxsCN_T05, dtype: float64

TxsCN_T06 = count    51081.000000
mean         2.427360
std          3.902669
min         -3.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         65.000000
Name: TxsCN_T06, dtype: float64

TxsCN_T07 = count    50291.000000
mean         2.650136
std          3.891635
min         -1.000000
25%          0.000000
50%          1.000000
75%          4.000000
max         54.000000
Name: TxsCN_T07, dtype: float64

TxsCN_T08 = count    48924.000000
mean         2.221589
std          3.477713
min         -1.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         49.000000
Name: TxsCN_T08, dtype: float64

TxsCN_T09 = count    47324.000000
mean         2.306906
std          3.616598
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         53.000000
Name: TxsCN_T09, dtype: float64

TxsCN_T10 = count    45933.000000
mean         2.014108
std          3.231560
min         -2.000000
```

```
25%          0.000000
50%          1.000000
75%          3.000000
max         46.000000
Name: TxsCN_T10, dtype: float64

TxsCN_T11 = count    44492.000000
mean         2.258406
std          3.556301
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         55.000000
Name: TxsCN_T11, dtype: float64

TxsCN_T12 = count    42873.000000
mean         2.224477
std          3.573449
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         56.000000
Name: TxsCN_T12, dtype: float64

TxsCI_T01 = count    51124.000000
mean         0.119846
std          0.955300
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         55.000000
Name: TxsCI_T01, dtype: float64

TxsCI_T02 = count    51112.000000
mean         0.138480
std          1.051061
min         -1.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         86.000000
Name: TxsCI_T02, dtype: float64

TxsCI_T03 = count    51114.000000
mean         0.130884
```

```
std          1.031562
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         90.000000
Name: TxsCI_T03, dtype: float64

TxsCI_T04 = count    51105.000000
mean         0.138303
std          1.089028
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max        100.000000
Name: TxsCI_T04, dtype: float64

TxsCI_T05 = count    51099.000000
mean         0.180943
std          1.100324
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         30.000000
Name: TxsCI_T05, dtype: float64

TxsCI_T06 = count    51081.000000
mean         0.125702
std          0.957453
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         53.000000
Name: TxsCI_T06, dtype: float64

TxsCI_T07 = count    50291.000000
mean         0.100177
std          0.772763
min         -1.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         33.000000
Name: TxsCI_T07, dtype: float64
```

```
TxsCI_T08 = count    48924.000000
mean         0.110375
std          0.915920
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         60.000000
Name: TxsCI_T08, dtype: float64

TxsCI_T09 = count    47324.000000
mean         0.118206
std          0.914732
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         48.000000
Name: TxsCI_T09, dtype: float64

TxsCI_T10 = count    45933.000000
mean         0.113949
std          0.887757
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         34.000000
Name: TxsCI_T10, dtype: float64

TxsCI_T11 = count    44492.000000
mean         0.103614
std          0.886927
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         42.000000
Name: TxsCI_T11, dtype: float64

TxsCI_T12 = count    42873.000000
mean         0.096284
std          0.815828
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         35.000000
```

```
Name: TxsCI_T12, dtype: float64

UsoL1_T01 = count    5.112400e+04
mean     1.840923e+05
std      2.891731e+05
min     -3.763997e+06
25%      1.770750e+04
50%      8.112900e+04
75%      2.278145e+05
max      6.911556e+06
Name: UsoL1_T01, dtype: float64

UsoL1_T02 = count    5.111200e+04
mean     1.799753e+05
std      2.850928e+05
min     -2.258860e+06
25%      1.600700e+04
50%      7.788150e+04
75%      2.233230e+05
max      6.171715e+06
Name: UsoL1_T02, dtype: float64

UsoL1_T03 = count    5.111400e+04
mean     1.779224e+05
std      2.815182e+05
min     -2.176334e+06
25%      1.685725e+04
50%      7.703350e+04
75%      2.202628e+05
max      4.475465e+06
Name: UsoL1_T03, dtype: float64

UsoL1_T04 = count    5.110500e+04
mean     1.724894e+05
std      2.783403e+05
min     -2.442226e+06
25%      1.758223e+04
50%      7.354100e+04
75%      2.097150e+05
max      5.395336e+06
Name: UsoL1_T04, dtype: float64

UsoL1_T05 = count    5.109900e+04
mean     1.675002e+05
std      2.772356e+05
min     -2.675118e+06
25%      1.442500e+04
50%      6.929600e+04
```

```
75%      2.025895e+05
max      5.239425e+06
Name: UsoL1_T05, dtype: float64

UsoL1_T06 = count    5.108100e+04
mean     1.588545e+05
std      2.719232e+05
min     -2.979813e+06
25%      8.579000e+03
50%      6.148023e+04
75%      1.905770e+05
max      5.183758e+06
Name: UsoL1_T06, dtype: float64

UsoL1_T07 = count    5.029100e+04
mean     1.573715e+05
std      2.764189e+05
min     -6.218200e+06
25%      7.558120e+03
50%      5.941300e+04
75%      1.853255e+05
max      5.127393e+06
Name: UsoL1_T07, dtype: float64

UsoL1_T08 = count    4.892400e+04
mean     1.532428e+05
std      2.729072e+05
min     -2.412276e+06
25%      4.650000e+03
50%      5.364800e+04
75%      1.795340e+05
max      5.043719e+06
Name: UsoL1_T08, dtype: float64

UsoL1_T09 = count    4.732400e+04
mean     1.534499e+05
std      2.768937e+05
min     -2.549459e+06
25%      4.012750e+03
50%      5.251650e+04
75%      1.779462e+05
max      5.041216e+06
Name: UsoL1_T09, dtype: float64

UsoL1_T10 = count    4.593300e+04
mean     1.555783e+05
std      2.844248e+05
min     -4.456480e+06
```

```
25%      3.012000e+03
50%      5.261200e+04
75%      1.809740e+05
max      5.114986e+06
Name: UsoL1_T10, dtype: float64

UsoL1_T11 = count    4.449200e+04
mean     1.586560e+05
std      2.925968e+05
min     -5.313688e+06
25%      1.111750e+03
50%      5.190219e+04
75%      1.854554e+05
max      5.760108e+06
Name: UsoL1_T11, dtype: float64

UsoL1_T12 = count    4.287300e+04
mean     1.671249e+05
std      3.034343e+05
min     -7.088177e+06
25%      1.990000e+03
50%      5.504200e+04
75%      1.978870e+05
max      5.647564e+06
Name: UsoL1_T12, dtype: float64

UsoLI_T01 = count    51124.000000
mean         8.294372
std        113.215624
min      -7785.120000
25%          0.000000
50%          0.000000
75%          0.000000
max       3929.810000
Name: UsoLI_T01, dtype: float64

UsoLI_T02 = count    51112.000000
mean         9.227014
std        107.233311
min      -5831.130000
25%          0.000000
50%          0.000000
75%          0.000000
max       3494.740000
Name: UsoLI_T02, dtype: float64

UsoLI_T03 = count    51114.000000
mean         9.297564
```

```
std        100.541601
min      -3800.000000
25%          0.000000
50%          0.000000
75%          0.000000
max       5191.140000
Name: UsoLI_T03, dtype: float64

UsoLI_T04 = count    51105.00000
mean         9.29131
std         91.78992
min      -2985.64000
25%          0.00000
50%          0.00000
75%          0.00000
max       4972.35000
Name: UsoLI_T04, dtype: float64

UsoLI_T05 = count    51099.000000
mean        11.918628
std        101.913449
min      -4662.220000
25%          0.000000
50%          0.000000
75%          0.000000
max       4329.620000
Name: UsoLI_T05, dtype: float64

UsoLI_T06 = count    51081.000000
mean         7.856107
std         86.892806
min      -4068.350000
25%          0.000000
50%          0.000000
75%          0.000000
max       3261.860000
Name: UsoLI_T06, dtype: float64

UsoLI_T07 = count    50291.000000
mean         6.752599
std         73.059098
min      -2596.150000
25%          0.000000
50%          0.000000
75%          0.000000
max       2596.370000
Name: UsoLI_T07, dtype: float64
```

```
UsoLI_T08 = count    48924.000000
mean         7.943869
std         95.433487
min      -2596.150000
25%          0.000000
50%          0.000000
75%          0.000000
max       6795.000000
Name: UsoLI_T08, dtype: float64

UsoLI_T09 = count    47324.000000
mean         8.379962
std         87.854225
min      -3192.620000
25%          0.000000
50%          0.000000
75%          0.000000
max       3419.070000
Name: UsoLI_T09, dtype: float64

UsoLI_T10 = count    45933.000000
mean         8.382645
std         92.400991
min      -4055.000000
25%          0.000000
50%          0.000000
75%          0.000000
max       3223.820000
Name: UsoLI_T10, dtype: float64

UsoLI_T11 = count    44492.000000
mean         7.992424
std         93.073405
min      -1658.800000
25%          0.000000
50%          0.000000
75%          0.000000
max       6310.630000
Name: UsoLI_T11, dtype: float64

UsoLI_T12 = count    42873.000000
mean         8.093227
std         88.744907
min      -2940.000000
25%          0.000000
50%          0.000000
75%          0.000000
max       3778.750000
```

```
Name: UsoLI_T12, dtype: float64

CUPO_L1 = count    5.112400e+04
mean     1.133187e+06
std      1.076922e+06
min      0.000000e+00
25%      4.000000e+05
50%      8.000000e+05
75%      1.527000e+06
max      2.153400e+07
Name: CUPO_L1, dtype: float64

CUPO_MX = count    51124.000000
mean      1400.320047
std       1597.344457
min          0.000000
25%        300.000000
50%       1000.000000
75%       1900.000000
max      40000.000000
Name: CUPO_MX, dtype: float64

PagoNac_T01 = count    5.112400e+04
mean     7.637553e+04
std      1.490256e+05
min      0.000000e+00
25%      5.000000e+03
50%      3.400150e+04
75%      9.200000e+04
max      8.697782e+06
Name: PagoNac_T01, dtype: float64

PagoNac_T02 = count    5.111200e+04
mean     7.906438e+04
std      1.429993e+05
min      0.000000e+00
25%      7.000000e+03
50%      3.700000e+04
75%      9.676250e+04
max      3.912000e+06
Name: PagoNac_T02, dtype: float64

PagoNac_T03 = count    5.111400e+04
mean     6.955806e+04
std      1.484869e+05
min      0.000000e+00
25%      4.990250e+03
50%      3.000000e+04
```

```
75%      8.236600e+04
max      1.020000e+07
Name: PagoNac_T03, dtype: float64

PagoNac_T04 = count    5.110500e+04
mean     7.655140e+04
std      1.500367e+05
min      0.000000e+00
25%      6.000000e+03
50%      3.500000e+04
75%      9.315900e+04
max      6.363388e+06
Name: PagoNac_T04, dtype: float64

PagoNac_T05 = count    5.109900e+04
mean     6.682742e+04
std      1.331202e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.800000e+04
75%      8.000000e+04
max      4.716979e+06
Name: PagoNac_T05, dtype: float64

PagoNac_T06 = count    5.108100e+04
mean     7.295417e+04
std      1.452696e+05
min      0.000000e+00
25%      1.000000e+00
50%      3.000000e+04
75%      8.778400e+04
max      6.551506e+06
Name: PagoNac_T06, dtype: float64

PagoNac_T07 = count    5.029100e+04
mean     6.708391e+04
std      1.466763e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.594800e+04
75%      7.997050e+04
max      8.288780e+06
Name: PagoNac_T07, dtype: float64

PagoNac_T08 = count    4.892400e+04
mean     6.666702e+04
std      1.487668e+05
min      0.000000e+00
```

```
25%      0.000000e+00
50%      2.600000e+04
75%      7.900000e+04
max      8.530346e+06
Name: PagoNac_T08, dtype: float64

PagoNac_T09 = count    4.732400e+04
mean     6.835682e+04
std      1.582834e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.698600e+04
75%      8.000000e+04
max      1.118726e+07
Name: PagoNac_T09, dtype: float64

PagoNac_T10 = count    4.593300e+04
mean     6.618686e+04
std      1.524743e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.385500e+04
75%      7.650000e+04
max      5.015501e+06
Name: PagoNac_T10, dtype: float64

PagoNac_T11 = count    4.449200e+04
mean     7.226579e+04
std      1.712437e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.529650e+04
75%      8.200000e+04
max      8.807955e+06
Name: PagoNac_T11, dtype: float64

PagoNac_T12 = count    4.287300e+04
mean     7.256960e+04
std      1.847762e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.627500e+04
75%      8.268600e+04
max      1.387330e+07
Name: PagoNac_T12, dtype: float64

PagoInt_T01 = count    5.112400e+04
mean     1.734930e+03
```

```
std      4.235368e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      4.219680e+06
Name: PagoInt_T01, dtype: float64

PagoInt_T02 = count    5.111200e+04
mean     1.666000e+03
std      4.005259e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      4.616855e+06
Name: PagoInt_T02, dtype: float64

PagoInt_T03 = count    5.111400e+04
mean     1.433989e+03
std      3.084587e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.412445e+06
Name: PagoInt_T03, dtype: float64

PagoInt_T04 = count    5.110500e+04
mean     1.833695e+03
std      3.866935e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      4.314960e+06
Name: PagoInt_T04, dtype: float64

PagoInt_T05 = count    5.109900e+04
mean     1.418216e+03
std      3.625830e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      3.920190e+06
Name: PagoInt_T05, dtype: float64
```

```
PagoInt_T06 = count    5.108100e+04
mean     2.642318e+03
std      1.672554e+05
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.251048e+07
Name: PagoInt_T06, dtype: float64

PagoInt_T07 = count    5.029100e+04
mean     1.168983e+03
std      2.501919e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.953964e+06
Name: PagoInt_T07, dtype: float64

PagoInt_T08 = count    4.892400e+04
mean     1.371531e+03
std      2.774018e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.212432e+06
Name: PagoInt_T08, dtype: float64

PagoInt_T09 = count    4.732400e+04
mean     1.561780e+03
std      3.162802e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.319616e+06
Name: PagoInt_T09, dtype: float64

PagoInt_T10 = count    4.593300e+04
mean     1.499077e+03
std      3.198899e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.182482e+06
```

```
Name: PagoInt_T10, dtype: float64

PagoInt_T11 = count    4.449200e+04
mean     1.558626e+03
std      3.041890e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.561931e+06
Name: PagoInt_T11, dtype: float64

PagoInt_T12 = count    4.287300e+04
mean     5.590727e+03
std      8.571474e+05
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.773575e+08
Name: PagoInt_T12, dtype: float64

FlgAct_T01 = count    51124.000000
mean         0.661861
std          0.473081
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T01, dtype: float64

FlgAct_T02 = count    51112.000000
mean         0.694827
std          0.460485
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T02, dtype: float64

FlgAct_T03 = count    51114.000000
mean         0.704778
std          0.456147
min          0.000000
25%          0.000000
50%          1.000000
```

```
75%          1.000000
max          1.000000
Name: FlgAct_T03, dtype: float64

FlgAct_T04 = count    51105.000000
mean         0.697212
std          0.459469
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T04, dtype: float64

FlgAct_T05 = count    51099.000000
mean         0.673497
std          0.468938
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T05, dtype: float64

FlgAct_T06 = count    51081.000000
mean         0.686439
std          0.463945
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T06, dtype: float64

FlgAct_T07 = count    50291.000000
mean         0.708497
std          0.454459
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T07, dtype: float64

FlgAct_T08 = count    48924.000000
mean         0.672758
std          0.469211
min          0.000000
```

```
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T08, dtype: float64

FlgAct_T09 = count    47324.000000
mean         0.677436
std          0.467462
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T09, dtype: float64

FlgAct_T10 = count    45933.000000
mean         0.653931
std          0.475721
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T10, dtype: float64

FlgAct_T11 = count    44492.000000
mean         0.669289
std          0.470475
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T11, dtype: float64

FlgAct_T12 = count    42873.000000
mean         0.659156
std          0.473998
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T12, dtype: float64

FacAN_T01 = count    5.112400e+04
mean     2.333281e+03
```

```
std      2.348929e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.700000e+06
Name: FacAN_T01, dtype: float64

FacAN_T02 = count    5.111200e+04
mean     2.327455e+03
std      2.427920e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.500000e+06
Name: FacAN_T02, dtype: float64

FacAN_T03 = count    5.111400e+04
mean     2.144673e+03
std      2.291057e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.600000e+06
Name: FacAN_T03, dtype: float64

FacAN_T04 = count    5.110500e+04
mean     1.861753e+03
std      2.085818e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.800000e+06
Name: FacAN_T04, dtype: float64

FacAN_T05 = count    5.109900e+04
mean     1.797090e+03
std      1.878463e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.559000e+06
Name: FacAN_T05, dtype: float64
```

```
FacAN_T06 = count      51081.000000
mean        1792.840645
std        18107.948292
min            0.000000
25%            0.000000
50%            0.000000
75%            0.000000
max      1000000.000000
Name: FacAN_T06, dtype: float64

FacAN_T07 = count    5.029100e+04
mean     1.726578e+03
std      2.016677e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.140000e+06
Name: FacAN_T07, dtype: float64

FacAN_T08 = count    4.892400e+04
mean     1.846904e+03
std      1.904839e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.282500e+06
Name: FacAN_T08, dtype: float64

FacAN_T09 = count      47324.000000
mean        1626.529055
std        17560.161383
min            0.000000
25%            0.000000
50%            0.000000
75%            0.000000
max      1000000.000000
Name: FacAN_T09, dtype: float64

FacAN_T10 = count    4.593300e+04
mean     1.427706e+03
std      1.827945e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.700000e+06
```

```
Name: FacAN_T10, dtype: float64

FacAN_T11 = count    4.449200e+04
mean     1.786787e+03
std      2.444245e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.000000e+06
Name: FacAN_T11, dtype: float64

FacAN_T12 = count    4.287300e+04
mean     1.724188e+03
std      2.177396e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.547000e+06
Name: FacAN_T12, dtype: float64

FacAI_T01 = count    5.112400e+04
mean     4.146368e+02
std      1.274503e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.022866e+06
Name: FacAI_T01, dtype: float64

FacAI_T02 = count    5.111200e+04
mean     4.869109e+02
std      1.469028e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.519827e+06
Name: FacAI_T02, dtype: float64

FacAI_T03 = count    5.111400e+04
mean     5.020665e+02
std      1.305066e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
```

```
75%      0.000000e+00
max      1.067759e+06
Name: FacAI_T03, dtype: float64

FacAI_T04 = count    5.110500e+04
mean     6.912942e+02
std      1.721731e+04
min     -4.784800e+04
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.983505e+06
Name: FacAI_T04, dtype: float64

FacAI_T05 = count    5.109900e+04
mean     8.160641e+02
std      1.732932e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.602307e+06
Name: FacAI_T05, dtype: float64

FacAI_T06 = count    5.108100e+04
mean     5.941286e+02
std      1.487397e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.201293e+06
Name: FacAI_T06, dtype: float64

FacAI_T07 = count     50291.000000
mean        303.808415
std        8898.405741
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      793935.000000
Name: FacAI_T07, dtype: float64

FacAI_T08 = count     48924.000000
mean        293.072807
std        9041.286775
min           0.000000
```

```
25%           0.000000
50%           0.000000
75%           0.000000
max      718013.000000
Name: FacAI_T08, dtype: float64

FacAI_T09 = count     47324.000000
mean        347.975488
std        9137.441891
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      735897.000000
Name: FacAI_T09, dtype: float64

FacAI_T10 = count    4.593300e+04
mean     4.658842e+02
std      1.259781e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.269478e+06
Name: FacAI_T10, dtype: float64

FacAI_T11 = count     44492.000000
mean        349.611055
std       10353.714091
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      755496.939900
Name: FacAI_T11, dtype: float64

FacAI_T12 = count     42873.000000
mean        373.337824
std       10719.708366
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      706966.928300
Name: FacAI_T12, dtype: float64

target = count    51124.000000
mean         0.089977
```

```
std          0.286152
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max          1.000000
Name: target, dtype: float64

IndRev_T12 = count     42873
unique         3
top            R
freq       26899
Name: IndRev_T12, dtype: object

IndRev_T11 = count     44492
unique         3
top            R
freq       27761
Name: IndRev_T11, dtype: object

IndRev_T10 = count     45933
unique         3
top            R
freq       29238
Name: IndRev_T10, dtype: object

IndRev_T09 = count     47324
unique         3
top            R
freq       30249
Name: IndRev_T09, dtype: object

IndRev_T08 = count     48924
unique         3
top            R
freq       31920
Name: IndRev_T08, dtype: object

IndRev_T07 = count     50291
unique         3
top            R
freq       34162
Name: IndRev_T07, dtype: object

IndRev_T06 = count     51077
unique         3
top            R
freq       34828
```

```
Name: IndRev_T06, dtype: object

IndRev_T05 = count     51099
unique         3
top            R
freq       37270
Name: IndRev_T05, dtype: object

IndRev_T04 = count     51105
unique         3
top            R
freq       39176
Name: IndRev_T04, dtype: object

IndRev_T03 = count     51114
unique         3
top            R
freq       38059
Name: IndRev_T03, dtype: object

IndRev_T02 = count     51112
unique         3
top            R
freq       37596
Name: IndRev_T02, dtype: object

IndRev_T01 = count     51124
unique         3
top            R
freq       38269
Name: IndRev_T01, dtype: object
```

4.0.3 A continuación vamos a ramificar el Dataframe original para poder hacer un estudio con gráficos, ya que, se deben separar los valores numéricos y categoricos. Para esto vamos a hacer un Array para contener las columnas categóricas encontradas en el Dataframe.

[69]:
```
# Creación del Array
columnas_a_seleccionar = []

# Ciclo for para iterar sobre los nombres de las columnas que empiezan con␣
 ↪"IndRev_"
for columna in df_acotado.columns:
    if columna.startswith('IndRev_'):
        columnas_a_seleccionar.append(columna)
```

```
# Seleccionar las columnas "IndRev_" en un nuevo Dataframe
df_categorico = df_acotado[columnas_a_seleccionar]

# Creamos un segundo Dataframe con las siguientes columnas
df_categorico2 = df_acotado[['Sexo', 'target']]

# Y concatenamos los Dataframe en unos solo
df_concatenado_categorico = pd.concat([df_categorico2, df_categorico], axis=1)
df_concatenado_categorico
```

[69]:
```
0      Sexo  target IndRev_T12 IndRev_T11 IndRev_T10 IndRev_T09 IndRev_T08  \
0         M       0          R          R          R          R          R
1         H       0          R          R          R          R          R
2         H       0          T          R          T          T          T
3         H       0          R          R          R          R          R
4         H       0          T          T          T          T          T
…     …      …         …         …         …         …         …
51119     H       0          R          R          R          R          R
51120     H       0          R          T          T          T          T
51121     H       0          R          R          R          P          P
51122     M       0       None       None          T          T          R
51123     H       0          T          T          T          R          R

0      IndRev_T07 IndRev_T06 IndRev_T05 IndRev_T04 IndRev_T03 IndRev_T02  \
0               R          R          R          R          R          R
1               R          R          R          R          R          R
2               T          T          T          T          T          T
3               R          R          R          R          R          R
4               T          T          T          T          R          T
…           …         …         …         …         …         …
51119           R          R          R          R          R          R
51120           T          R          R          R          R          R
51121           T          R          R          R          R          R
51122           R          T          T          T          T          R
51123           T          T          R          T          T          T

0      IndRev_T01
0               R
1               R
2               T
3               R
4               R
…           …
51119           R
51120           R
51121           R
51122           R
```

```
51123          R

[51124 rows x 14 columns]
```

4.0.4 Sustraemos todas las columnas categóricas del Dataframe original para renombrarlo como un nuevo Dataframe de sólo columnas numéricas.

[70]:
```
df_acotado_numericas = df_acotado.
  ↪drop(['Sexo','target','IndRev_T12','IndRev_T11','IndRev_T10','IndRev_T09','IndRev_T08','Ind
  ↪axis=1)
df_acotado_numericas
```

[70]:
```
0          Id  Edad     Renta  Region  TC  Cuentas  Hipotecario  Consumo  \
0           1    43       NaN    13.0   3        1            0        0
1           2    46  143640.0    13.0   1        1            1        0
2           3    45  929106.0    13.0   2        1            1        0
3           4    46  172447.0    13.0   2        1            0        0
4           5    46  805250.0    13.0   3        2            1        0
…       …   …        …     …   ..       …           …       …
51119   51120    51  364978.0    13.0   3        2            0        0
51120   51121    51  625376.0    13.0   1        1            0        0
51121   51122    47  806220.0    13.0   2        1            0        0
51122   51123    47       NaN    13.0   1        1            0        0
51123   51124    51  840878.0    13.0   2        1            0        0

0       Debito  Ctacte  …  FacAI_T03  FacAI_T04  FacAI_T05  FacAI_T06  \
0            1       1  …        0.0        0.0        0.0        0.0
1            0       1  …        0.0        0.0        0.0        0.0
2            1       1  …        0.0        0.0        0.0        0.0
3            0       0  …        0.0        0.0        0.0        0.0
4            0       1  …        0.0        0.0        0.0        0.0
…        …      …   …  …          …          …          …          …
51119        1       1  …        0.0        0.0        0.0        0.0
51120        1       1  …        0.0        0.0        0.0        0.0
51121        1       1  …        0.0        0.0        0.0        0.0
51122        0       1  …        0.0        0.0        0.0        0.0
51123        1       1  …        0.0        0.0        0.0        0.0

0       FacAI_T07  FacAI_T08  FacAI_T09  FacAI_T10  FacAI_T11  FacAI_T12
0             0.0        0.0        0.0        0.0        0.0        0.0
1             0.0        0.0        0.0        0.0        0.0        0.0
2             0.0        0.0        0.0        0.0        0.0        0.0
3             0.0        0.0        0.0        0.0        0.0        0.0
4             0.0        0.0        0.0        0.0        0.0        0.0
…           …          …          …          …          …          …
51119         0.0        0.0        0.0        0.0        0.0        0.0
51120         0.0        0.0        0.0        0.0        0.0        0.0
```

```
51121        0.0        0.0        0.0        0.0        0.0        0.0
51122        0.0        0.0        0.0        0.0        NaN        NaN
51123        0.0        0.0        0.0        0.0        0.0        0.0

[51124 rows x 146 columns]
```

4.0.5 Revisamos el data frame de las variables numéricas.

[71]:
```
for i in df_acotado_numericas:
  print(f"{i} = {df_acotado_numericas[i].describe()} \n")
```

```
Id = count    51124.000000
mean     25562.500000
std      14758.371918
min          1.000000
25%      12781.750000
50%      25562.500000
75%      38343.250000
max      51124.000000
Name: Id, dtype: float64

Edad = count    51124.000000
mean        38.702879
std         13.302573
min          9.000000
25%         28.000000
50%         35.000000
75%         46.000000
max        104.000000
Name: Edad, dtype: float64

Renta = count    3.775900e+04
mean     6.630771e+05
std      4.092795e+05
min      1.000000e+00
25%      4.199990e+05
50%      5.670120e+05
75%      8.149035e+05
max      1.308933e+07
Name: Renta, dtype: float64

Region = count    51071.000000
mean        10.828220
std          3.392703
min          1.000000
25%          9.000000
50%         13.000000
```

```
75%         13.000000
max         13.000000
Name: Region, dtype: float64

TC = count    51124.000000
mean          1.732376
std           0.877470
min           1.000000
25%           1.000000
50%           2.000000
75%           2.000000
max          12.000000
Name: TC, dtype: float64

Cuentas = count    51124.000000
mean          1.407206
std           0.550357
min           1.000000
25%           1.000000
50%           1.000000
75%           2.000000
max           5.000000
Name: Cuentas, dtype: float64

Hipotecario = count    51124.000000
mean          0.137548
std           0.344428
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max           1.000000
Name: Hipotecario, dtype: float64

Consumo = count    51124.000000
mean          0.000900
std           0.029983
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max           1.000000
Name: Consumo, dtype: float64

Debito = count    51124.000000
mean          0.875284
std           0.330400
min           0.000000
```

```
25%          1.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: Debito, dtype: float64

Ctacte = count    51124.000000
mean         0.925260
std          0.262974
min          0.000000
25%          1.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: Ctacte, dtype: float64

Antiguedad = count    51124.000000
mean        38.896154
std         35.672549
min          6.000000
25%         14.000000
50%         25.000000
75%         54.000000
max        324.000000
Name: Antiguedad, dtype: float64

Dualidad = count    51124.000000
mean         0.381347
std          0.485722
min          0.000000
25%          0.000000
50%          0.000000
75%          1.000000
max          1.000000
Name: Dualidad, dtype: float64

FacCN_T01 = count    5.112400e+04
mean     5.920637e+04
std      1.175587e+05
min     -1.199000e+05
25%      0.000000e+00
50%      1.645650e+04
75%      7.346850e+04
max      2.820920e+06
Name: FacCN_T01, dtype: float64

FacCN_T02 = count    5.111200e+04
mean     6.589887e+04
```

```
std      1.257957e+05
min     -3.377790e+05
25%      0.000000e+00
50%      2.244250e+04
75%      8.314475e+04
max      5.900000e+06
Name: FacCN_T02, dtype: float64

FacCN_T03 = count    5.111400e+04
mean     6.934812e+04
std      1.332791e+05
min     -2.923440e+05
25%      0.000000e+00
50%      2.499000e+04
75%      8.856800e+04
max      9.340500e+06
Name: FacCN_T03, dtype: float64

FacCN_T04 = count    5.110500e+04
mean     6.583953e+04
std      1.202210e+05
min     -2.331900e+05
25%      0.000000e+00
50%      2.300000e+04
75%      8.397000e+04
max      4.219445e+06
Name: FacCN_T04, dtype: float64

FacCN_T05 = count    5.109900e+04
mean     5.525613e+04
std      1.058188e+05
min     -8.900000e+05
25%      0.000000e+00
50%      1.600000e+04
75%      6.958000e+04
max      2.903625e+06
Name: FacCN_T05, dtype: float64

FacCN_T06 = count    5.108100e+04
mean     6.324297e+04
std      1.201309e+05
min     -4.634800e+05
25%      0.000000e+00
50%      2.000000e+04
75%      7.840200e+04
max      3.874900e+06
Name: FacCN_T06, dtype: float64
```

```
FacCN_T07 = count    5.029100e+04
mean     6.809511e+04
std      1.179712e+05
min     -1.963660e+05
25%      0.000000e+00
50%      2.760300e+04
75%      8.930250e+04
max      3.308662e+06
Name: FacCN_T07, dtype: float64

FacCN_T08 = count    4.892400e+04
mean     5.757568e+04
std      1.090502e+05
min     -3.823700e+05
25%      0.000000e+00
50%      1.800900e+04
75%      7.187400e+04
max      2.364120e+06
Name: FacCN_T08, dtype: float64

FacCN_T09 = count    4.732400e+04
mean     5.925538e+04
std      1.140950e+05
min     -1.520000e+05
25%      0.000000e+00
50%      1.940000e+04
75%      7.431000e+04
max      4.057749e+06
Name: FacCN_T09, dtype: float64

FacCN_T10 = count    4.593300e+04
mean     5.525821e+04
std      1.092217e+05
min     -1.864970e+05
25%      0.000000e+00
50%      1.499000e+04
75%      6.636300e+04
max      2.861687e+06
Name: FacCN_T10, dtype: float64

FacCN_T11 = count    4.449200e+04
mean     5.764097e+04
std      1.106455e+05
min     -2.418286e+06
25%      0.000000e+00
50%      1.820000e+04
75%      7.140000e+04
max      2.367085e+06
```

```
Name: FacCN_T11, dtype: float64

FacCN_T12 = count    4.287300e+04
mean     5.687099e+04
std      1.104570e+05
min     -4.800000e+05
25%      0.000000e+00
50%      1.550000e+04
75%      7.114800e+04
max      3.000000e+06
Name: FacCN_T12, dtype: float64

FacCI_T01 = count    5.112400e+04
mean     5.069743e+03
std      5.244459e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      4.166432e+06
Name: FacCI_T01, dtype: float64

FacCI_T02 = count    5.111200e+04
mean     5.528803e+03
std      5.134608e+04
min     -4.556200e+04
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.299676e+06
Name: FacCI_T02, dtype: float64

FacCI_T03 = count    5.111400e+04
mean     5.252891e+03
std      4.992106e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.967445e+06
Name: FacCI_T03, dtype: float64

FacCI_T04 = count    5.110500e+04
mean     5.180115e+03
std      5.037720e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
```

```
75%      0.000000e+00
max      3.923086e+06
Name: FacCI_T04, dtype: float64

FacCI_T05 = count    5.109900e+04
mean     6.163716e+03
std      4.849814e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.338298e+06
Name: FacCI_T05, dtype: float64

FacCI_T06 = count    5.108100e+04
mean     4.706476e+03
std      4.539180e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.453795e+06
Name: FacCI_T06, dtype: float64

FacCI_T07 = count    5.029100e+04
mean     3.778118e+03
std      3.724837e+04
min     -2.121400e+04
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.962278e+06
Name: FacCI_T07, dtype: float64

FacCI_T08 = count    4.892400e+04
mean     4.396519e+03
std      4.841080e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      3.574102e+06
Name: FacCI_T08, dtype: float64

FacCI_T09 = count    4.732400e+04
mean     4.631330e+03
std      4.450957e+04
min      0.000000e+00
```

```
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.003492e+06
Name: FacCI_T09, dtype: float64

FacCI_T10 = count    4.593300e+04
mean     4.734170e+03
std      4.540915e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.735124e+06
Name: FacCI_T10, dtype: float64

FacCI_T11 = count    4.449200e+04
mean     4.653677e+03
std      5.290325e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      3.393667e+06
Name: FacCI_T11, dtype: float64

FacCI_T12 = count    4.287300e+04
mean     4.060128e+03
std      4.297850e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.038296e+06
Name: FacCI_T12, dtype: float64

TxsCN_T01 = count    51124.000000
mean         2.161411
std          3.521555
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         92.000000
Name: TxsCN_T01, dtype: float64

TxsCN_T02 = count    51112.000000
mean         2.371459
```

```
std          3.726697
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         94.000000
Name: TxsCN_T02, dtype: float64

TxsCN_T03 = count    51114.000000
mean         2.425911
std          3.720883
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         47.000000
Name: TxsCN_T03, dtype: float64

TxsCN_T04 = count    51105.000000
mean         2.316505
std          3.591466
min         -1.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         50.000000
Name: TxsCN_T04, dtype: float64

TxsCN_T05 = count    51099.000000
mean         2.193194
std          3.583263
min         -1.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         58.000000
Name: TxsCN_T05, dtype: float64

TxsCN_T06 = count    51081.000000
mean         2.427360
std          3.902669
min         -3.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         65.000000
Name: TxsCN_T06, dtype: float64
```

```
TxsCN_T07 = count    50291.000000
mean          2.650136
std           3.891635
min          -1.000000
25%           0.000000
50%           1.000000
75%           4.000000
max          54.000000
Name: TxsCN_T07, dtype: float64

TxsCN_T08 = count    48924.000000
mean          2.221589
std           3.477713
min          -1.000000
25%           0.000000
50%           1.000000
75%           3.000000
max          49.000000
Name: TxsCN_T08, dtype: float64

TxsCN_T09 = count    47324.000000
mean          2.306906
std           3.616598
min          -2.000000
25%           0.000000
50%           1.000000
75%           3.000000
max          53.000000
Name: TxsCN_T09, dtype: float64

TxsCN_T10 = count    45933.000000
mean          2.014108
std           3.231560
min          -2.000000
25%           0.000000
50%           1.000000
75%           3.000000
max          46.000000
Name: TxsCN_T10, dtype: float64

TxsCN_T11 = count    44492.000000
mean          2.258406
std           3.556301
min          -2.000000
25%           0.000000
50%           1.000000
75%           3.000000
max          55.000000
```

```
Name: TxsCN_T11, dtype: float64

TxsCN_T12 = count    42873.000000
mean         2.224477
std          3.573449
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         56.000000
Name: TxsCN_T12, dtype: float64

TxsCI_T01 = count    51124.000000
mean         0.119846
std          0.955300
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         55.000000
Name: TxsCI_T01, dtype: float64

TxsCI_T02 = count    51112.000000
mean         0.138480
std          1.051061
min         -1.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         86.000000
Name: TxsCI_T02, dtype: float64

TxsCI_T03 = count    51114.000000
mean         0.130884
std          1.031562
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         90.000000
Name: TxsCI_T03, dtype: float64

TxsCI_T04 = count    51105.000000
mean         0.138303
std          1.089028
min          0.000000
25%          0.000000
50%          0.000000
```

```
75%          0.000000
max        100.000000
Name: TxsCI_T04, dtype: float64

TxsCI_T05 = count    51099.000000
mean         0.180943
std          1.100324
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         30.000000
Name: TxsCI_T05, dtype: float64

TxsCI_T06 = count    51081.000000
mean         0.125702
std          0.957453
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         53.000000
Name: TxsCI_T06, dtype: float64

TxsCI_T07 = count    50291.000000
mean         0.100177
std          0.772763
min         -1.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         33.000000
Name: TxsCI_T07, dtype: float64

TxsCI_T08 = count    48924.000000
mean         0.110375
std          0.915920
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         60.000000
Name: TxsCI_T08, dtype: float64

TxsCI_T09 = count    47324.000000
mean         0.118206
std          0.914732
min          0.000000
```

```
25%          0.000000
50%          0.000000
75%          0.000000
max         48.000000
Name: TxsCI_T09, dtype: float64

TxsCI_T10 = count    45933.000000
mean         0.113949
std          0.887757
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         34.000000
Name: TxsCI_T10, dtype: float64

TxsCI_T11 = count    44492.000000
mean         0.103614
std          0.886927
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         42.000000
Name: TxsCI_T11, dtype: float64

TxsCI_T12 = count    42873.000000
mean         0.096284
std          0.815828
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         35.000000
Name: TxsCI_T12, dtype: float64

UsoL1_T01 = count    5.112400e+04
mean     1.840923e+05
std      2.891731e+05
min     -3.763997e+06
25%      1.770750e+04
50%      8.112900e+04
75%      2.278145e+05
max      6.911556e+06
Name: UsoL1_T01, dtype: float64

UsoL1_T02 = count    5.111200e+04
mean     1.799753e+05
```

```
std      2.850928e+05
min     -2.258860e+06
25%      1.600700e+04
50%      7.788150e+04
75%      2.233230e+05
max      6.171715e+06
Name: UsoL1_T02, dtype: float64

UsoL1_T03 = count    5.111400e+04
mean     1.779224e+05
std      2.815182e+05
min     -2.176334e+06
25%      1.685725e+04
50%      7.703350e+04
75%      2.202628e+05
max      4.475465e+06
Name: UsoL1_T03, dtype: float64

UsoL1_T04 = count    5.110500e+04
mean     1.724894e+05
std      2.783403e+05
min     -2.442226e+06
25%      1.758223e+04
50%      7.354100e+04
75%      2.097150e+05
max      5.395336e+06
Name: UsoL1_T04, dtype: float64

UsoL1_T05 = count    5.109900e+04
mean     1.675002e+05
std      2.772356e+05
min     -2.675118e+06
25%      1.442500e+04
50%      6.929600e+04
75%      2.025895e+05
max      5.239425e+06
Name: UsoL1_T05, dtype: float64

UsoL1_T06 = count    5.108100e+04
mean     1.588545e+05
std      2.719232e+05
min     -2.979813e+06
25%      8.579000e+03
50%      6.148023e+04
75%      1.905770e+05
max      5.183758e+06
Name: UsoL1_T06, dtype: float64
```

```
UsoL1_T07 = count    5.029100e+04
mean     1.573715e+05
std      2.764189e+05
min     -6.218200e+06
25%      7.558120e+03
50%      5.941300e+04
75%      1.853255e+05
max      5.127393e+06
Name: UsoL1_T07, dtype: float64

UsoL1_T08 = count    4.892400e+04
mean     1.532428e+05
std      2.729072e+05
min     -2.412276e+06
25%      4.650000e+03
50%      5.364800e+04
75%      1.795340e+05
max      5.043719e+06
Name: UsoL1_T08, dtype: float64

UsoL1_T09 = count    4.732400e+04
mean     1.534499e+05
std      2.768937e+05
min     -2.549459e+06
25%      4.012750e+03
50%      5.251650e+04
75%      1.779462e+05
max      5.041216e+06
Name: UsoL1_T09, dtype: float64

UsoL1_T10 = count    4.593300e+04
mean     1.555783e+05
std      2.844248e+05
min     -4.456480e+06
25%      3.012000e+03
50%      5.261200e+04
75%      1.809740e+05
max      5.114986e+06
Name: UsoL1_T10, dtype: float64

UsoL1_T11 = count    4.449200e+04
mean     1.586560e+05
std      2.925968e+05
min     -5.313688e+06
25%      1.111750e+03
50%      5.190219e+04
75%      1.854554e+05
max      5.760108e+06
```

```
Name: UsoL1_T11, dtype: float64

UsoL1_T12 = count    4.287300e+04
mean     1.671249e+05
std      3.034343e+05
min     -7.088177e+06
25%      1.990000e+03
50%      5.504200e+04
75%      1.978870e+05
max      5.647564e+06
Name: UsoL1_T12, dtype: float64

UsoLI_T01 = count    51124.000000
mean         8.294372
std        113.215624
min      -7785.120000
25%          0.000000
50%          0.000000
75%          0.000000
max       3929.810000
Name: UsoLI_T01, dtype: float64

UsoLI_T02 = count    51112.000000
mean         9.227014
std        107.233311
min      -5831.130000
25%          0.000000
50%          0.000000
75%          0.000000
max       3494.740000
Name: UsoLI_T02, dtype: float64

UsoLI_T03 = count    51114.000000
mean         9.297564
std        100.541601
min      -3800.000000
25%          0.000000
50%          0.000000
75%          0.000000
max       5191.140000
Name: UsoLI_T03, dtype: float64

UsoLI_T04 = count    51105.00000
mean         9.29131
std         91.78992
min      -2985.64000
25%          0.00000
50%          0.00000
```

```
75%          0.00000
max       4972.35000
Name: UsoLI_T04, dtype: float64

UsoLI_T05 = count    51099.000000
mean        11.918628
std        101.913449
min      -4662.220000
25%          0.000000
50%          0.000000
75%          0.000000
max       4329.620000
Name: UsoLI_T05, dtype: float64

UsoLI_T06 = count    51081.000000
mean         7.856107
std         86.892806
min      -4068.350000
25%          0.000000
50%          0.000000
75%          0.000000
max       3261.860000
Name: UsoLI_T06, dtype: float64

UsoLI_T07 = count    50291.000000
mean         6.752599
std         73.059098
min      -2596.150000
25%          0.000000
50%          0.000000
75%          0.000000
max       2596.370000
Name: UsoLI_T07, dtype: float64

UsoLI_T08 = count    48924.000000
mean         7.943869
std         95.433487
min      -2596.150000
25%          0.000000
50%          0.000000
75%          0.000000
max       6795.000000
Name: UsoLI_T08, dtype: float64

UsoLI_T09 = count    47324.000000
mean         8.379962
std         87.854225
min      -3192.620000
```

```
25%          0.000000
50%          0.000000
75%          0.000000
max       3419.070000
Name: UsoLI_T09, dtype: float64

UsoLI_T10 = count    45933.000000
mean         8.382645
std         92.400991
min      -4055.000000
25%          0.000000
50%          0.000000
75%          0.000000
max       3223.820000
Name: UsoLI_T10, dtype: float64

UsoLI_T11 = count    44492.000000
mean         7.992424
std         93.073405
min      -1658.800000
25%          0.000000
50%          0.000000
75%          0.000000
max       6310.630000
Name: UsoLI_T11, dtype: float64

UsoLI_T12 = count    42873.000000
mean         8.093227
std         88.744907
min      -2940.000000
25%          0.000000
50%          0.000000
75%          0.000000
max       3778.750000
Name: UsoLI_T12, dtype: float64

CUPO_L1 = count    5.112400e+04
mean     1.133187e+06
std      1.076922e+06
min      0.000000e+00
25%      4.000000e+05
50%      8.000000e+05
75%      1.527000e+06
max      2.153400e+07
Name: CUPO_L1, dtype: float64

CUPO_MX = count    51124.000000
mean      1400.320047
```

```
std       1597.344457
min          0.000000
25%        300.000000
50%       1000.000000
75%       1900.000000
max      40000.000000
Name: CUPO_MX, dtype: float64

PagoNac_T01 = count    5.112400e+04
mean     7.637553e+04
std      1.490256e+05
min      0.000000e+00
25%      5.000000e+03
50%      3.400150e+04
75%      9.200000e+04
max      8.697782e+06
Name: PagoNac_T01, dtype: float64

PagoNac_T02 = count    5.111200e+04
mean     7.906438e+04
std      1.429993e+05
min      0.000000e+00
25%      7.000000e+03
50%      3.700000e+04
75%      9.676250e+04
max      3.912000e+06
Name: PagoNac_T02, dtype: float64

PagoNac_T03 = count    5.111400e+04
mean     6.955806e+04
std      1.484869e+05
min      0.000000e+00
25%      4.990250e+03
50%      3.000000e+04
75%      8.236600e+04
max      1.020000e+07
Name: PagoNac_T03, dtype: float64

PagoNac_T04 = count    5.110500e+04
mean     7.655140e+04
std      1.500367e+05
min      0.000000e+00
25%      6.000000e+03
50%      3.500000e+04
75%      9.315900e+04
max      6.363388e+06
Name: PagoNac_T04, dtype: float64
```

```
PagoNac_T05 = count    5.109900e+04
mean     6.682742e+04
std      1.331202e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.800000e+04
75%      8.000000e+04
max      4.716979e+06
Name: PagoNac_T05, dtype: float64

PagoNac_T06 = count    5.108100e+04
mean     7.295417e+04
std      1.452696e+05
min      0.000000e+00
25%      1.000000e+00
50%      3.000000e+04
75%      8.778400e+04
max      6.551506e+06
Name: PagoNac_T06, dtype: float64

PagoNac_T07 = count    5.029100e+04
mean     6.708391e+04
std      1.466763e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.594800e+04
75%      7.997050e+04
max      8.288780e+06
Name: PagoNac_T07, dtype: float64

PagoNac_T08 = count    4.892400e+04
mean     6.666702e+04
std      1.487668e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.600000e+04
75%      7.900000e+04
max      8.530346e+06
Name: PagoNac_T08, dtype: float64

PagoNac_T09 = count    4.732400e+04
mean     6.835682e+04
std      1.582834e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.698600e+04
75%      8.000000e+04
max      1.118726e+07
```

```
Name: PagoNac_T09, dtype: float64

PagoNac_T10 = count    4.593300e+04
mean     6.618686e+04
std      1.524743e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.385500e+04
75%      7.650000e+04
max      5.015501e+06
Name: PagoNac_T10, dtype: float64

PagoNac_T11 = count    4.449200e+04
mean     7.226579e+04
std      1.712437e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.529650e+04
75%      8.200000e+04
max      8.807955e+06
Name: PagoNac_T11, dtype: float64

PagoNac_T12 = count    4.287300e+04
mean     7.256960e+04
std      1.847762e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.627500e+04
75%      8.268600e+04
max      1.387330e+07
Name: PagoNac_T12, dtype: float64

PagoInt_T01 = count    5.112400e+04
mean     1.734930e+03
std      4.235368e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      4.219680e+06
Name: PagoInt_T01, dtype: float64

PagoInt_T02 = count    5.111200e+04
mean     1.666000e+03
std      4.005259e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
```

```
75%      0.000000e+00
max      4.616855e+06
Name: PagoInt_T02, dtype: float64

PagoInt_T03 = count    5.111400e+04
mean     1.433989e+03
std      3.084587e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.412445e+06
Name: PagoInt_T03, dtype: float64

PagoInt_T04 = count    5.110500e+04
mean     1.833695e+03
std      3.866935e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      4.314960e+06
Name: PagoInt_T04, dtype: float64

PagoInt_T05 = count    5.109900e+04
mean     1.418216e+03
std      3.625830e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      3.920190e+06
Name: PagoInt_T05, dtype: float64

PagoInt_T06 = count    5.108100e+04
mean     2.642318e+03
std      1.672554e+05
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.251048e+07
Name: PagoInt_T06, dtype: float64

PagoInt_T07 = count    5.029100e+04
mean     1.168983e+03
std      2.501919e+04
min      0.000000e+00
```

```
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.953964e+06
Name: PagoInt_T07, dtype: float64

PagoInt_T08 = count    4.892400e+04
mean     1.371531e+03
std      2.774018e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.212432e+06
Name: PagoInt_T08, dtype: float64

PagoInt_T09 = count    4.732400e+04
mean     1.561780e+03
std      3.162802e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.319616e+06
Name: PagoInt_T09, dtype: float64

PagoInt_T10 = count    4.593300e+04
mean     1.499077e+03
std      3.198899e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.182482e+06
Name: PagoInt_T10, dtype: float64

PagoInt_T11 = count    4.449200e+04
mean     1.558626e+03
std      3.041890e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.561931e+06
Name: PagoInt_T11, dtype: float64

PagoInt_T12 = count    4.287300e+04
mean     5.590727e+03
```

```
std      8.571474e+05
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.773575e+08
Name: PagoInt_T12, dtype: float64

FlgAct_T01 = count    51124.000000
mean         0.661861
std          0.473081
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T01, dtype: float64

FlgAct_T02 = count    51112.000000
mean         0.694827
std          0.460485
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T02, dtype: float64

FlgAct_T03 = count    51114.000000
mean         0.704778
std          0.456147
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T03, dtype: float64

FlgAct_T04 = count    51105.000000
mean         0.697212
std          0.459469
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T04, dtype: float64
```

```
FlgAct_T05 = count    51099.000000
mean          0.673497
std           0.468938
min           0.000000
25%           0.000000
50%           1.000000
75%           1.000000
max           1.000000
Name: FlgAct_T05, dtype: float64

FlgAct_T06 = count    51081.000000
mean          0.686439
std           0.463945
min           0.000000
25%           0.000000
50%           1.000000
75%           1.000000
max           1.000000
Name: FlgAct_T06, dtype: float64

FlgAct_T07 = count    50291.000000
mean          0.708497
std           0.454459
min           0.000000
25%           0.000000
50%           1.000000
75%           1.000000
max           1.000000
Name: FlgAct_T07, dtype: float64

FlgAct_T08 = count    48924.000000
mean          0.672758
std           0.469211
min           0.000000
25%           0.000000
50%           1.000000
75%           1.000000
max           1.000000
Name: FlgAct_T08, dtype: float64

FlgAct_T09 = count    47324.000000
mean          0.677436
std           0.467462
min           0.000000
25%           0.000000
50%           1.000000
75%           1.000000
max           1.000000
```

```
Name: FlgAct_T09, dtype: float64

FlgAct_T10 = count    45933.000000
mean          0.653931
std           0.475721
min           0.000000
25%           0.000000
50%           1.000000
75%           1.000000
max           1.000000
Name: FlgAct_T10, dtype: float64

FlgAct_T11 = count    44492.000000
mean          0.669289
std           0.470475
min           0.000000
25%           0.000000
50%           1.000000
75%           1.000000
max           1.000000
Name: FlgAct_T11, dtype: float64

FlgAct_T12 = count    42873.000000
mean          0.659156
std           0.473998
min           0.000000
25%           0.000000
50%           1.000000
75%           1.000000
max           1.000000
Name: FlgAct_T12, dtype: float64

FacAN_T01 = count    5.112400e+04
mean     2.333281e+03
std      2.348929e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.700000e+06
Name: FacAN_T01, dtype: float64

FacAN_T02 = count    5.111200e+04
mean     2.327455e+03
std      2.427920e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
```

```
75%      0.000000e+00
max      1.500000e+06
Name: FacAN_T02, dtype: float64

FacAN_T03 = count    5.111400e+04
mean     2.144673e+03
std      2.291057e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.600000e+06
Name: FacAN_T03, dtype: float64

FacAN_T04 = count    5.110500e+04
mean     1.861753e+03
std      2.085818e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.800000e+06
Name: FacAN_T04, dtype: float64

FacAN_T05 = count    5.109900e+04
mean     1.797090e+03
std      1.878463e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.559000e+06
Name: FacAN_T05, dtype: float64

FacAN_T06 = count      51081.000000
mean        1792.840645
std        18107.948292
min            0.000000
25%            0.000000
50%            0.000000
75%            0.000000
max      1000000.000000
Name: FacAN_T06, dtype: float64

FacAN_T07 = count    5.029100e+04
mean     1.726578e+03
std      2.016677e+04
min      0.000000e+00
```

```
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.140000e+06
Name: FacAN_T07, dtype: float64

FacAN_T08 = count    4.892400e+04
mean     1.846904e+03
std      1.904839e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.282500e+06
Name: FacAN_T08, dtype: float64

FacAN_T09 = count      47324.000000
mean        1626.529055
std        17560.161383
min            0.000000
25%            0.000000
50%            0.000000
75%            0.000000
max      1000000.000000
Name: FacAN_T09, dtype: float64

FacAN_T10 = count    4.593300e+04
mean     1.427706e+03
std      1.827945e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.700000e+06
Name: FacAN_T10, dtype: float64

FacAN_T11 = count    4.449200e+04
mean     1.786787e+03
std      2.444245e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.000000e+06
Name: FacAN_T11, dtype: float64

FacAN_T12 = count    4.287300e+04
mean     1.724188e+03
```

```
std      2.177396e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.547000e+06
Name: FacAN_T12, dtype: float64

FacAI_T01 = count    5.112400e+04
mean     4.146368e+02
std      1.274503e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.022866e+06
Name: FacAI_T01, dtype: float64

FacAI_T02 = count    5.111200e+04
mean     4.869109e+02
std      1.469028e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.519827e+06
Name: FacAI_T02, dtype: float64

FacAI_T03 = count    5.111400e+04
mean     5.020665e+02
std      1.305066e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.067759e+06
Name: FacAI_T03, dtype: float64

FacAI_T04 = count    5.110500e+04
mean     6.912942e+02
std      1.721731e+04
min     -4.784800e+04
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.983505e+06
Name: FacAI_T04, dtype: float64
```

```
FacAI_T05 = count    5.109900e+04
mean     8.160641e+02
std      1.732932e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.602307e+06
Name: FacAI_T05, dtype: float64

FacAI_T06 = count    5.108100e+04
mean     5.941286e+02
std      1.487397e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.201293e+06
Name: FacAI_T06, dtype: float64

FacAI_T07 = count     50291.000000
mean        303.808415
std        8898.405741
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      793935.000000
Name: FacAI_T07, dtype: float64

FacAI_T08 = count     48924.000000
mean        293.072807
std        9041.286775
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      718013.000000
Name: FacAI_T08, dtype: float64

FacAI_T09 = count     47324.000000
mean        347.975488
std        9137.441891
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      735897.000000
```

```
Name: FacAI_T09, dtype: float64

FacAI_T10 = count    4.593300e+04
mean     4.658842e+02
std      1.259781e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.269478e+06
Name: FacAI_T10, dtype: float64

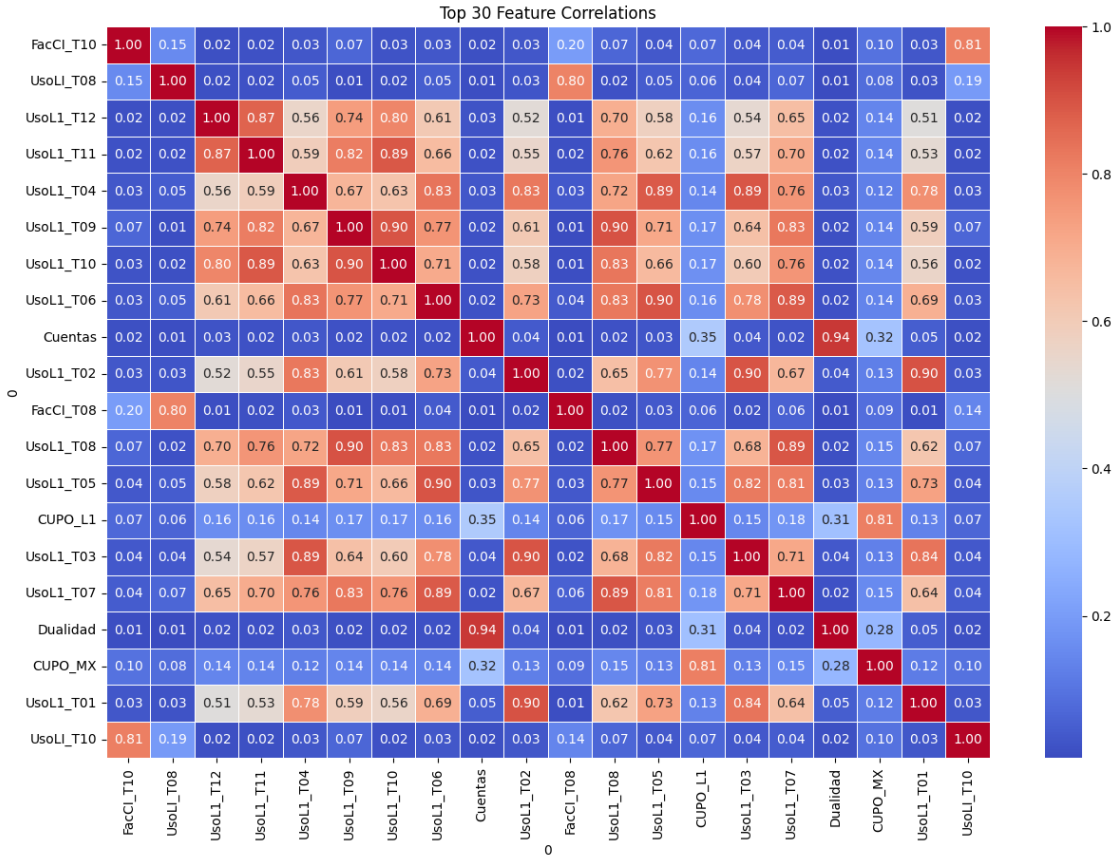
FacAI_T11 = count     44492.000000
mean        349.611055
std       10353.714091
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      755496.939900
Name: FacAI_T11, dtype: float64

FacAI_T12 = count     42873.000000
mean        373.337824
std       10719.708366
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      706966.928300
Name: FacAI_T12, dtype: float64
```

4.0.6 Revisamos las correlaciones que tienen las variables numéricas en nuestro nuevo Dataframe.

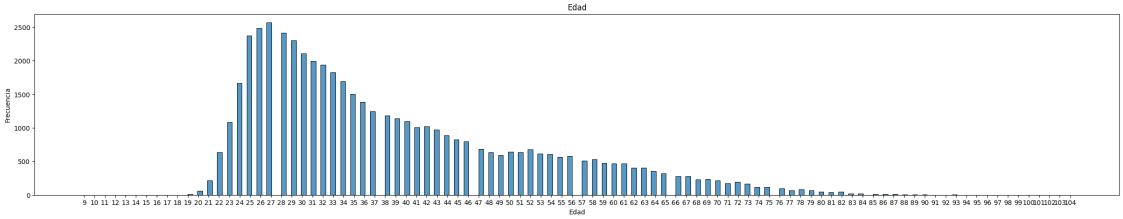
[72]:
```python
def plot_top_correlations(dataframe, top_n=30):
    # Calcular la matriz de correlación
    corr_matrix = dataframe.corr().abs()

    # Extraer las correlaciones superiores a la diagonal
    triangulo_matriz = corr_matrix.where(
        np.triu(np.ones(corr_matrix.shape), k=1).astype(bool)
    )

    # Encontrar las correlaciones más altas
    top_corr_pairs = (
```

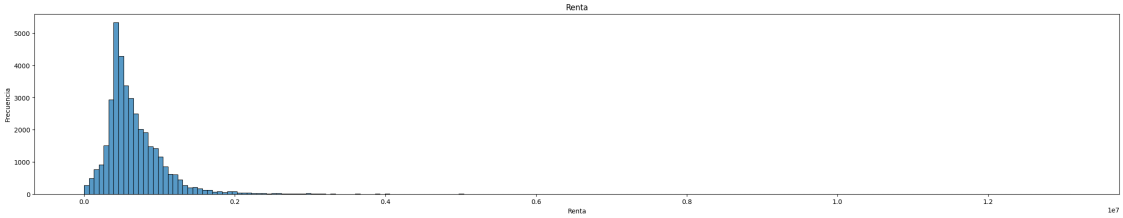
```
        triangulo_matriz.unstack()
        .dropna()
        .sort_values(ascending=False)
        .head(top_n)
    )

    # Obtener las columnas de las correlaciones más altas
    top_columnas = list(set([index[0] for index in top_corr_pairs.index] +␣
 ↪[index[1] for index in top_corr_pairs.index]))

    # Crear un nuevo dataframe con solo las columnas seleccionadas
    top_corr_dataframe = dataframe[top_columnas]

    # Calcular la matriz de correlación del nuevo dataframe
    top_corr_matriz = top_corr_dataframe.corr()

    # Dibujar el mapa de calor
    plt.figure(figsize=(15, 10))
    sb.heatmap(top_corr_matriz, annot=True, cmap='coolwarm', fmt='.2f',␣
 ↪linewidths=.5)
    plt.title('Top {} Feature Correlations'.format(top_n))
    plt.show()

# Uso de la función
# Asegúrate de reemplazar 'your_dataframe' con el nombre de tu dataframe
plot_top_correlations(df_acotado_numericas)
```

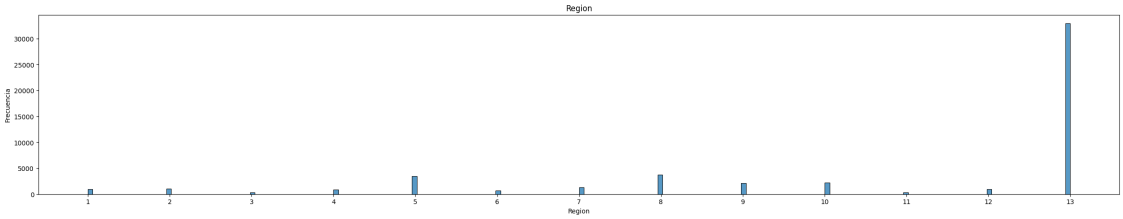


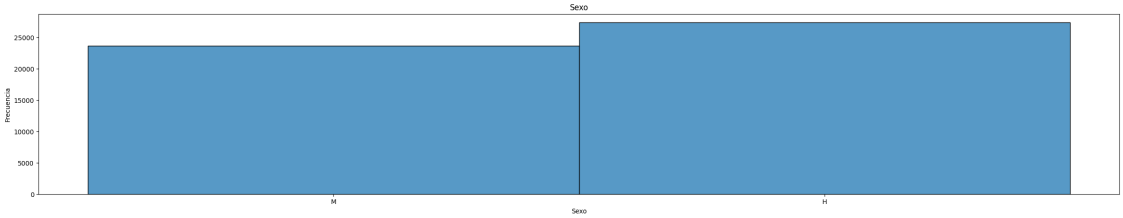
[73]:
```
# Definimos las columnas que queremos analizar en detalle
columnas_para_filtrar = ['Edad', 'Region', 'Antiguedad']

# Iteramos sobre cada columna del DataFrame, excluyendo un gran conjunto de␣
 ↪columnas
for columna in df_acotado.drop(df_acotado[['Id','FacCN_T01', 'FacCN_T02',␣
 ↪'FacCN_T03', 'FacCN_T04',
             'FacCN_T05', 'FacCN_T06', 'FacCN_T07', 'FacCN_T08', 'FacCN_T09',␣
 ↪'FacCN_T10', 'FacCN_T11',
             'FacCN_T12', 'FacCI_T01', 'FacCI_T02', 'FacCI_T03', 'FacCI_T04',␣
 ↪'FacCI_T05', 'FacCI_T06',
             'FacCI_T07', 'FacCI_T08', 'FacCI_T09', 'FacCI_T10', 'FacCI_T11',␣
 ↪'FacCI_T12', 'TxsCN_T01',
             'TxsCN_T02', 'TxsCN_T03', 'TxsCN_T04', 'TxsCN_T05', 'TxsCN_T06',␣
 ↪'TxsCN_T07', 'TxsCN_T08',
             'TxsCN_T09', 'TxsCN_T10', 'TxsCN_T11', 'TxsCN_T12', 'TxsCI_T01',␣
 ↪'TxsCI_T02', 'TxsCI_T03',
             'TxsCI_T04', 'TxsCI_T05', 'TxsCI_T06', 'TxsCI_T07', 'TxsCI_T08',␣
 ↪'TxsCI_T09', 'TxsCI_T10',
```

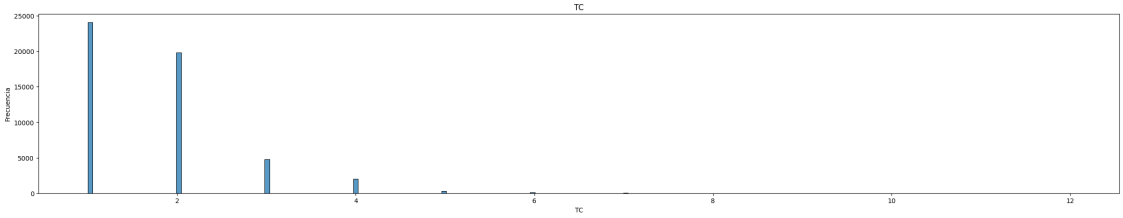
```
            'TxsCI_T11', 'TxsCI_T12', 'UsoL1_T01','UsoL1_T02', 'UsoL1_T03',␣
↪'UsoL1_T04', 'UsoL1_T05',
            'UsoL1_T06', 'UsoL1_T07', 'UsoL1_T08', 'UsoL1_T09', 'UsoL1_T10',␣
↪'UsoL1_T11', 'UsoL1_T12',
            'UsoLI_T01', 'UsoLI_T02', 'UsoLI_T03', 'UsoLI_T04', 'UsoLI_T05',␣
↪'UsoLI_T06', 'UsoLI_T07',
            'UsoLI_T08', 'UsoLI_T09', 'UsoLI_T10', 'UsoLI_T11', 'UsoLI_T12',
            'PagoNac_T01', 'PagoNac_T02', 'PagoNac_T03', 'PagoNac_T04',␣
↪'PagoNac_T05', 'PagoNac_T06',
            'PagoNac_T07', 'PagoNac_T08', 'PagoNac_T09', 'PagoNac_T10',␣
↪'PagoNac_T11', 'PagoNac_T12',
            'PagoInt_T01', 'PagoInt_T02', 'PagoInt_T03', 'PagoInt_T04',␣
↪'PagoInt_T05', 'PagoInt_T06',
            'PagoInt_T07', 'PagoInt_T08', 'PagoInt_T09', 'PagoInt_T10',␣
↪'PagoInt_T11', 'PagoInt_T12',
            'FlgAct_T01', 'FlgAct_T02', 'FlgAct_T03', 'FlgAct_T04',␣
↪'FlgAct_T05', 'FlgAct_T06', 'FlgAct_T07',
            'FlgAct_T08', 'FlgAct_T09', 'FlgAct_T10', 'FlgAct_T11',␣
↪'FlgAct_T12', 'FacAN_T01', 'FacAN_T02',
            'FacAN_T03', 'FacAN_T04', 'FacAN_T05', 'FacAN_T06', 'FacAN_T07',␣
↪'FacAN_T08', 'FacAN_T09',
            'FacAN_T10', 'FacAN_T11', 'FacAN_T12', 'FacAI_T01', 'FacAI_T02',␣
↪'FacAI_T03', 'FacAI_T04',
            'FacAI_T05', 'FacAI_T06', 'FacAI_T07', 'FacAI_T08', 'FacAI_T09',␣
↪'FacAI_T10', 'FacAI_T11',
            'FacAI_T12',␣
↪'IndRev_T12','IndRev_T11','IndRev_T10','IndRev_T09','IndRev_T08',
           ␣
↪'IndRev_T07','IndRev_T06','IndRev_T05','IndRev_T04','IndRev_T03','IndRev_T02','IndRev_T01']]
↪axis=1):
    plt.figure(figsize=(30, 5))
    sb.histplot(df_acotado[columna], bins=200)
    plt.title(columna)
    plt.xlabel(columna)
    plt.ylabel('Frecuencia')

    # Si la columna está en la lista de columnas a filtrar, ajustamos los␣
↪límites de los ejes x
    if columna in columnas_para_filtrar:
        valor_max = df_acotado[columna].max()
        valor_min = df_acotado[columna].min()
        plt.xticks(np.arange(valor_min, valor_max + 1, step=1))
        plt.show()
```

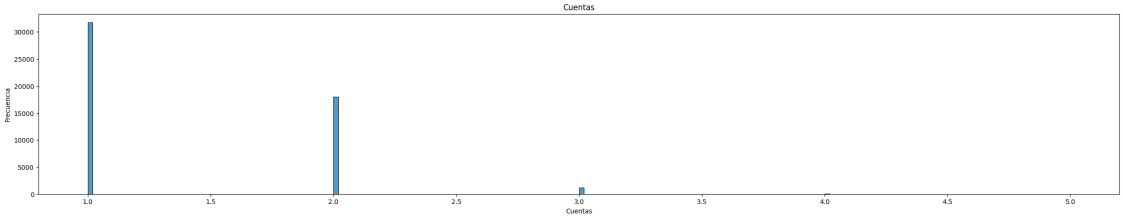

Edad
Frecuencia
Edad

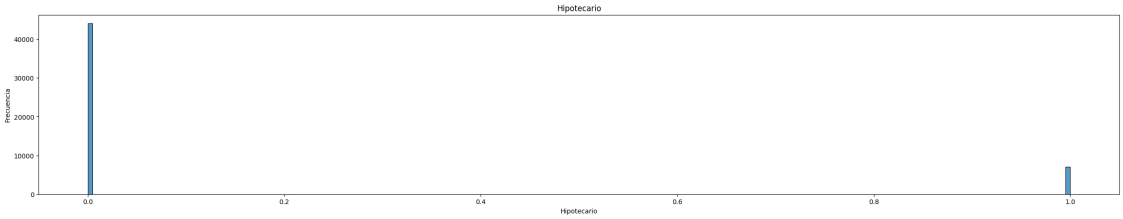

Renta
Frecuencia
Renta
1e7

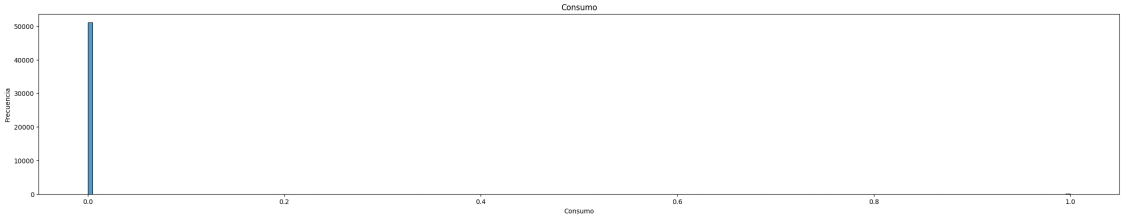

Region
Frecuencia
Region

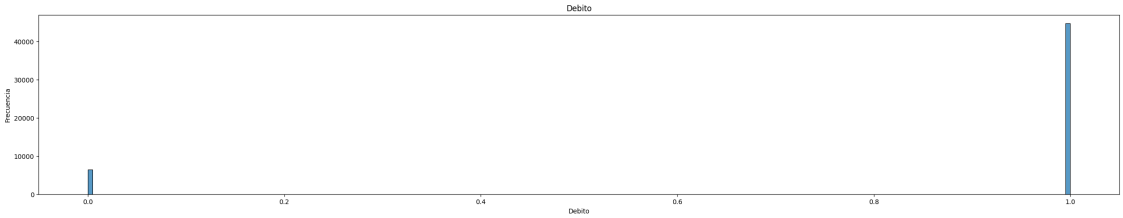

Sexo
Frecuencia
M
H
Sexo

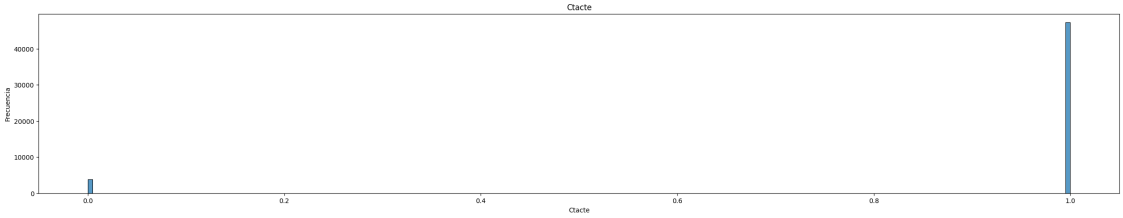

TC
Frecuencia
TC

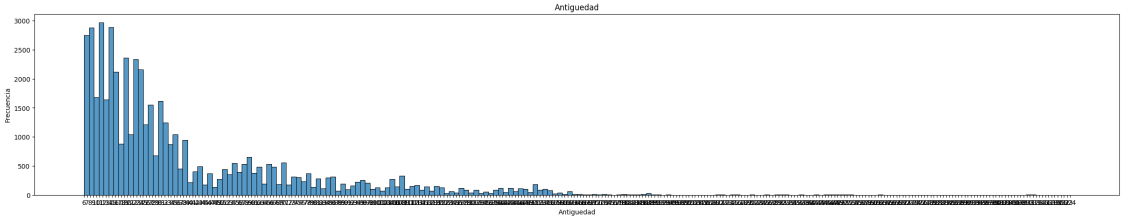

Cuentas
Frecuencia
30000
25000
20000
15000
10000
5000
0
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Cuentas

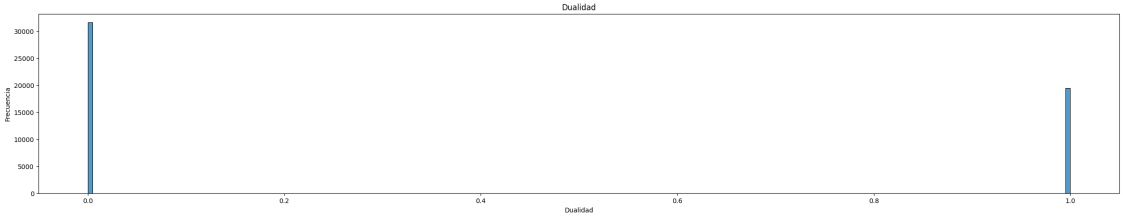

Hipotecario
Frecuencia
40000
30000
20000
10000
0
0.0
0.2
0.4
0.6
0.8
1.0
Hipotecario

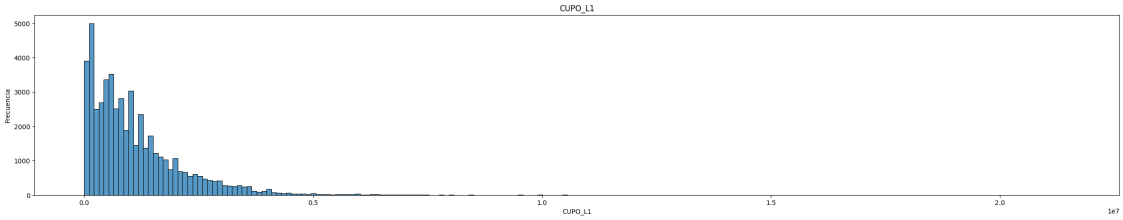

Consumo
Frecuencia
50000
40000
30000
20000
10000
0
0.0
0.2
0.4
0.6
0.8
1.0
Consumo

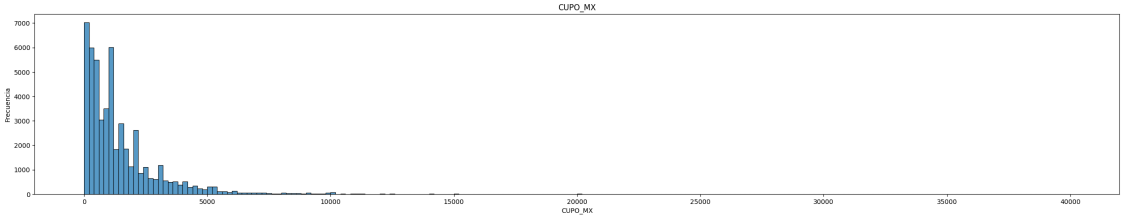

Debito
Frecuencia
40000
30000
20000
10000
0
0.0
0.2
0.4
0.6
0.8
1.0
Debito

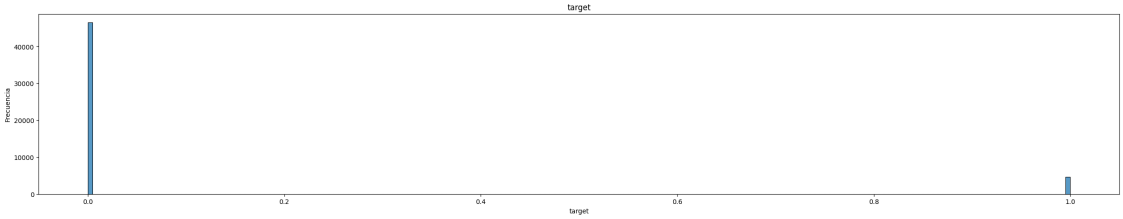

Ctacte
Frecuencia
40000
30000
20000
10000
0
0.0
0.2
0.4
0.6
0.8
1.0
Ctacte


Antiguedad
Frecuencia
Antiguedad


Dualidad
Frecuencia
Dualidad


CUPO_L1
Frecuencia
CUPO_L1
1e7


CUPO_MX
Frecuencia
CUPO_MX


target
Frecuencia
target

4.0.7 Una vez visto los gráficos, ahora veremos la distribución de los datos, destacando los cuartiles, los valores extremos (outliers) y algunas estadísticas básicas que podremos ver de forma gráfica de tres características posiblemente importantes.

[74]:
```
# Lista de columnas a analizar
columnas_a_analizar = ['Edad', 'Region', 'Antiguedad']

# Definir subconjuntos de edad en más rangos
df_sub_edad_menor_20 = df_acotado[df_acotado['Edad'] < 20]
df_sub_edad_joven = df_acotado[(df_acotado['Edad'] >= 20) & (df_acotado['Edad']
 ↪< 30)]
df_sub_edad_adulto = df_acotado[(df_acotado['Edad'] >= 30) &
 ↪(df_acotado['Edad'] <= 60)]
df_sub_edad_mayor = df_acotado[(df_acotado['Edad'] > 60) & (df_acotado['Edad']
 ↪<= 70)]
df_sub_edad_mayor_70 = df_acotado[df_acotado['Edad'] > 70]

# Transparencia para los scatterplots
alpha_value = 0.5

# Contar el número de regiones únicas, incluyendo NaN
num_regiones = df_acotado['Region'].nunique()

# Mapa de colores personalizado para las regiones, incluyendo NaN
colores_regiones = sb.color_palette("tab20", num_regiones + 1)  # Incluye un
 ↪color para NaN

for columna in columnas_a_analizar:
    plt.figure(figsize=(20, 10))

    # Cálculo de la media y mediana
    media = df_acotado[columna].mean()
    mediana = df_acotado[columna].median()

    # Cálculo del rango intercuartílico (IQR)
    Q1 = df_acotado[columna].quantile(0.25)
    Q3 = df_acotado[columna].quantile(0.75)
    IQR = Q3 - Q1
    lim_inferior = Q1 - 1.5 * IQR
    lim_superior = Q3 + 1.5 * IQR

    # Boxplot con IQR destacado
    plt.subplot(2, 2, 1)
    sb.boxplot(x=df_acotado[columna], palette='Set2')

    # Resaltar el IQR en el boxplot
```

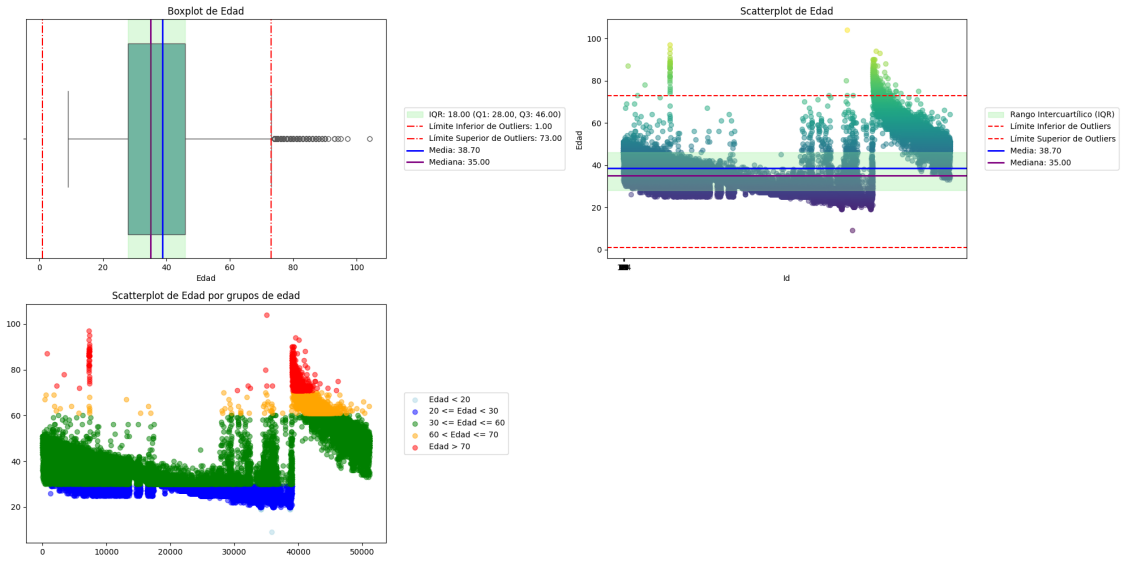
```
    plt.axvspan(Q1, Q3, color='lightgreen', alpha=0.3, label=f'IQR: {IQR:.2f}␣
↪(Q1: {Q1:.2f}, Q3: {Q3:.2f})')

    # Líneas para los límites de los outliers
    plt.axvline(lim_inferior, color='red', linestyle='dashdot', label=f'Límite␣
↪Inferior de Outliers: {lim_inferior:.2f}')
    plt.axvline(lim_superior, color='red', linestyle='dashdot', label=f'Límite␣
↪Superior de Outliers: {lim_superior:.2f}')

    # Líneas para la media y mediana
    plt.axvline(media, color='blue', linestyle='-', label=f'Media: {media:.
↪2f}', linewidth=2)
    plt.axvline(mediana, color='purple', linestyle='-', label=f'Mediana:␣
↪{mediana:.2f}', linewidth=2)

    # Asegurarse de que los ticks en el eje X sean enteros (solo para la␣
↪columna Región)
    if columna == 'Region':
        plt.xticks(np.arange(1, num_regiones + 1, step=1), [str(i) for i in␣
↪range(1, num_regiones + 1)])

    plt.title(f'Boxplot de {columna}')
    plt.legend(loc='center left', bbox_to_anchor=(1.05, 0.5), borderaxespad=0) ␣
↪# Leyenda fuera del gráfico

    # Scatterplot con transparencia y coloración por valores (Regiones␣
↪ordenadas)
    plt.subplot(2, 2, 2)

    if columna == 'Region':
        # Ordenar las regiones y asignar colores
        df_acotado['Region'] = df_acotado['Region'].fillna(0)  # Llenar NaN con␣
↪0 temporalmente
        regiones_ordenadas = np.sort(df_acotado['Region'].unique())  # Ordenar␣
↪las regiones numéricamente, NaN quedará en 0

        # Separar la etiqueta para Región NaN
        regiones_ordenadas = regiones_ordenadas[regiones_ordenadas != 0]  #␣
↪Excluir temporalmente Región 0 (NaN)
        regiones_ordenadas = np.append(regiones_ordenadas, 0)  # Añadir Región␣
↪0 (NaN) al final

        for idx, region in enumerate(regiones_ordenadas):
            if region == 0:
                label = 'Región NaN'  # Etiqueta para NaN
            else:
```

```
                label = f'Región {int(region)}'  # Etiquetas para las regiones␣
↪numéricas

            df_region = df_acotado[df_acotado['Region'] == region]
            plt.scatter(df_region['Id'], df_region['Region'],␣
↪alpha=alpha_value, label=label, c=[colores_regiones[idx]])

        # Ajustar el eje Y para que muestre los números enteros del 1 al 13
        plt.yticks(np.arange(1, 14, step=1), [str(i) for i in range(1, 14)])
        plt.xticks(np.arange(0, df_acotado['Id'].max(), step=10000))  # Asegura␣
↪que las regiones se muestren adecuadamente
    else:
        plt.scatter(df_acotado['Id'], df_acotado[columna], alpha=alpha_value,␣
↪c=df_acotado[columna], cmap='viridis')

    # Resaltar IQR en el scatterplot
    plt.axhspan(Q1, Q3, color='lightgreen', alpha=0.3, label='Rango␣
↪Intercuartílico (IQR)')
    plt.axhline(lim_inferior, color='red', linestyle='--', label='Límite␣
↪Inferior de Outliers')
    plt.axhline(lim_superior, color='red', linestyle='--', label='Límite␣
↪Superior de Outliers')

    # Líneas para la media y mediana en el scatterplot
    plt.axhline(media, color='blue', linestyle='-', label=f'Media: {media:.
↪2f}', linewidth=2)
    plt.axhline(mediana, color='purple', linestyle='-', label=f'Mediana:␣
↪{mediana:.2f}', linewidth=2)

    plt.title(f'Scatterplot de {columna}')
    plt.xlabel('Id')
    plt.ylabel(columna)
    plt.legend(loc='center left', bbox_to_anchor=(1.05, 0.5), borderaxespad=0) ␣
↪# Leyenda fuera del gráfico

    # Añadir más ticks en el eje X para columnas específicas
    if columna == 'Edad':
        plt.xticks(np.arange(df_acotado['Edad'].min(), df_acotado['Edad'].max()␣
↪+ 1, step=5))
    elif columna == 'Region':
        plt.xticks(np.arange(1, num_regiones + 1, step=1))  # Mostrar regiones␣
↪del 1 a num_regiones
    elif columna == 'Antiguedad':
        plt.xticks(np.arange(df_acotado['Antiguedad'].min(),␣
↪df_acotado['Antiguedad'].max() + 1, step=2))
```

```
    # Scatterplot con subconjuntos por grupos de edad, añadiendo nuevos rangos
    plt.subplot(2, 2, 3)
    if columna == 'Edad':
        plt.scatter(df_sub_edad_menor_20['Id'], df_sub_edad_menor_20[columna],␣
↪alpha=alpha_value, label='Edad < 20', c='lightblue')
        plt.scatter(df_sub_edad_joven['Id'], df_sub_edad_joven[columna],␣
↪alpha=alpha_value, label='20 <= Edad < 30', c='blue')
        plt.scatter(df_sub_edad_adulto['Id'], df_sub_edad_adulto[columna],␣
↪alpha=alpha_value, label='30 <= Edad <= 60', c='green')
        plt.scatter(df_sub_edad_mayor['Id'], df_sub_edad_mayor[columna],␣
↪alpha=alpha_value, label='60 < Edad <= 70', c='orange')
        plt.scatter(df_sub_edad_mayor_70['Id'], df_sub_edad_mayor_70[columna],␣
↪alpha=alpha_value, label='Edad > 70', c='red')
        plt.legend(loc='center left', bbox_to_anchor=(1.05, 0.5),␣
↪borderaxespad=0)  # Leyenda fuera del gráfico
        plt.title(f'Scatterplot de {columna} por grupos de edad')

    elif columna == 'Region':
        # Scatterplot con valores NaN en negro
        for region in regiones_ordenadas:
            if region == 0:
                df_region_nan = df_acotado[df_acotado['Region'] == 0]  #␣
↪Filtrar Región NaN
                plt.scatter(df_region_nan['Id'], df_region_nan['Region'],␣
↪alpha=alpha_value, label='Región NaN', c='black')
            else:
                df_region = df_acotado[df_acotado['Region'] == region]
                plt.scatter(df_region['Id'], df_region[columna],␣
↪alpha=alpha_value, label=f'Región {int(region)}')

        plt.legend(loc='center left', bbox_to_anchor=(1.05, 0.5),␣
↪borderaxespad=0)  # Leyenda fuera del gráfico
        plt.title(f'Scatterplot de {columna} por Región')

    elif columna == 'Antiguedad':
        # Subconjuntos de antigüedad
        df_sub_antiguo = df_acotado[df_acotado['Antiguedad'] > 12]
        df_sub_nuevo = df_acotado[df_acotado['Antiguedad'] <= 12]
        plt.scatter(df_sub_antiguo['Id'], df_sub_antiguo[columna],␣
↪alpha=alpha_value, label='Antigüedad > 12', c='orange')
        plt.scatter(df_sub_nuevo['Id'], df_sub_nuevo[columna],␣
↪alpha=alpha_value, label='Antigüedad <= 12', c='purple')
        plt.legend(loc='center left', bbox_to_anchor=(1.05, 0.5),␣
↪borderaxespad=0)  # Leyenda fuera del gráfico
        plt.title(f'Scatterplot de {columna} por Antigüedad')
```

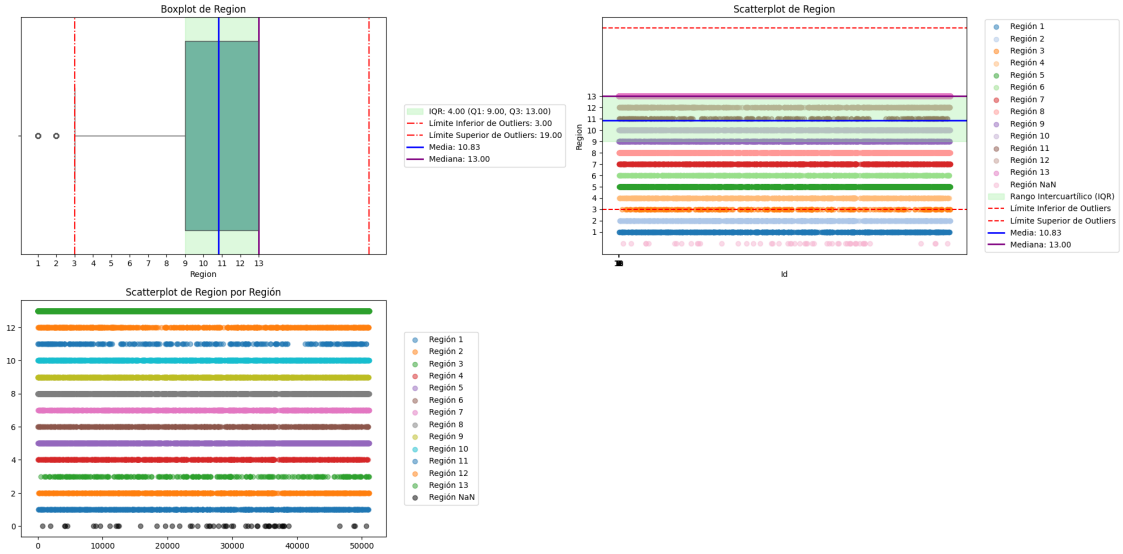
```
    # Ajustar diseño para evitar solapamientos
    plt.tight_layout()
    plt.show()
```

```
C:\Users\new11\AppData\Local\Temp\ipykernel_12772\1179865995.py:36:
FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in
v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same
effect.

  sb.boxplot(x=df_acotado[columna], palette='Set2')
```




```
C:\Users\new11\AppData\Local\Temp\ipykernel_12772\1179865995.py:36:
FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in
v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same
effect.

  sb.boxplot(x=df_acotado[columna], palette='Set2')
C:\Users\new11\AppData\Local\Temp\ipykernel_12772\1179865995.py:61:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  df_acotado['Region'] = df_acotado['Region'].fillna(0)  # Llenar NaN con 0
```

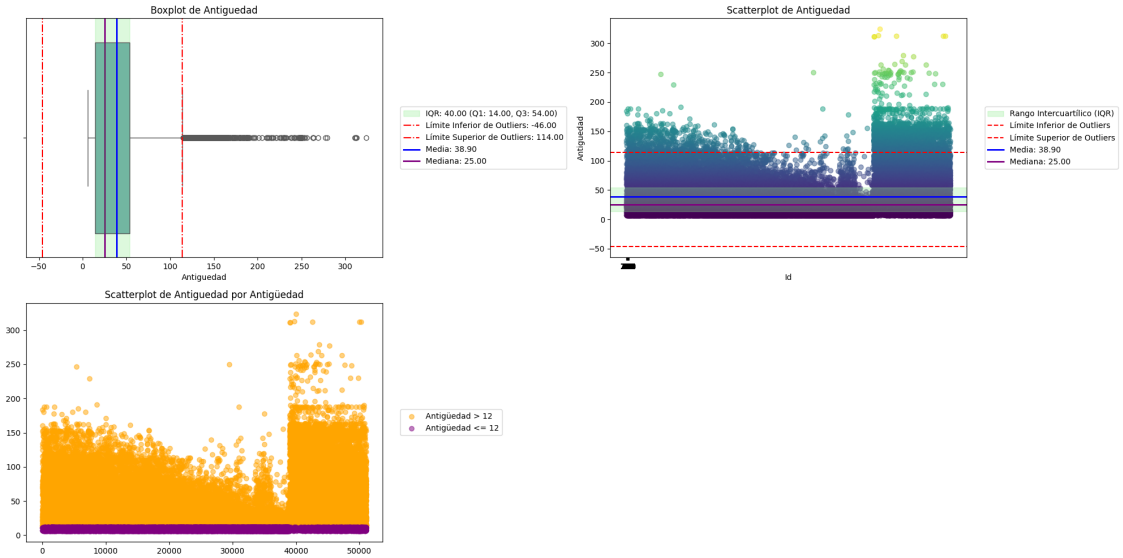
temporalmente



C:\Users\new11\AppData\Local\Temp\ipykernel_12772\1179865995.py:36: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

```
  sb.boxplot(x=df_acotado[columna], palette='Set2')
```



4.0.8 A continuación revisaremos los datos de la columna Región para saber exactamente cómo se distribuyen los clientes a lo largo del país.

[75]:
```
region = df_acotado['Region']
region.unique()
```

[75]:
```
array([13.,  9., 10.,  8.,  7.,  6.,  5., 12., 11.,  4.,  1.,  2.,  3.,
        0.])
```

4.0.9 Revisamos un poco de estadística básica.

[76]:
```
# Eliminar los valores NaN en la columna 'Region'
df_acotado['Region'].dropna(inplace=True)

# Eliminar los valores 0 de la columna 'Region'
df_acotado = df_acotado[df_acotado['Region'] != 0]

# Mostrar las estadísticas descriptivas de la columna 'Region'
print(df_acotado['Region'].describe())

# Mostrar los valores únicos en la columna 'Region'
print(df_acotado['Region'].unique())
```

```
count    51071.000000
mean        10.828220
std          3.392703
min          1.000000
25%          9.000000
50%         13.000000
75%         13.000000
max         13.000000
Name: Region, dtype: float64
[13.  9. 10.  8.  7.  6.  5. 12. 11.  4.  1.  2.  3.]
```

```
C:\Users\new11\AppData\Local\Temp\ipykernel_12772\2994265869.py:2:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  df_acotado['Region'].dropna(inplace=True)
```

4.0.10 Verificamos que estamos tratando el número de la región como un dato entero.

[77]:
```
region = df_acotado['Region']
region = region.astype(int)
region.unique()
```

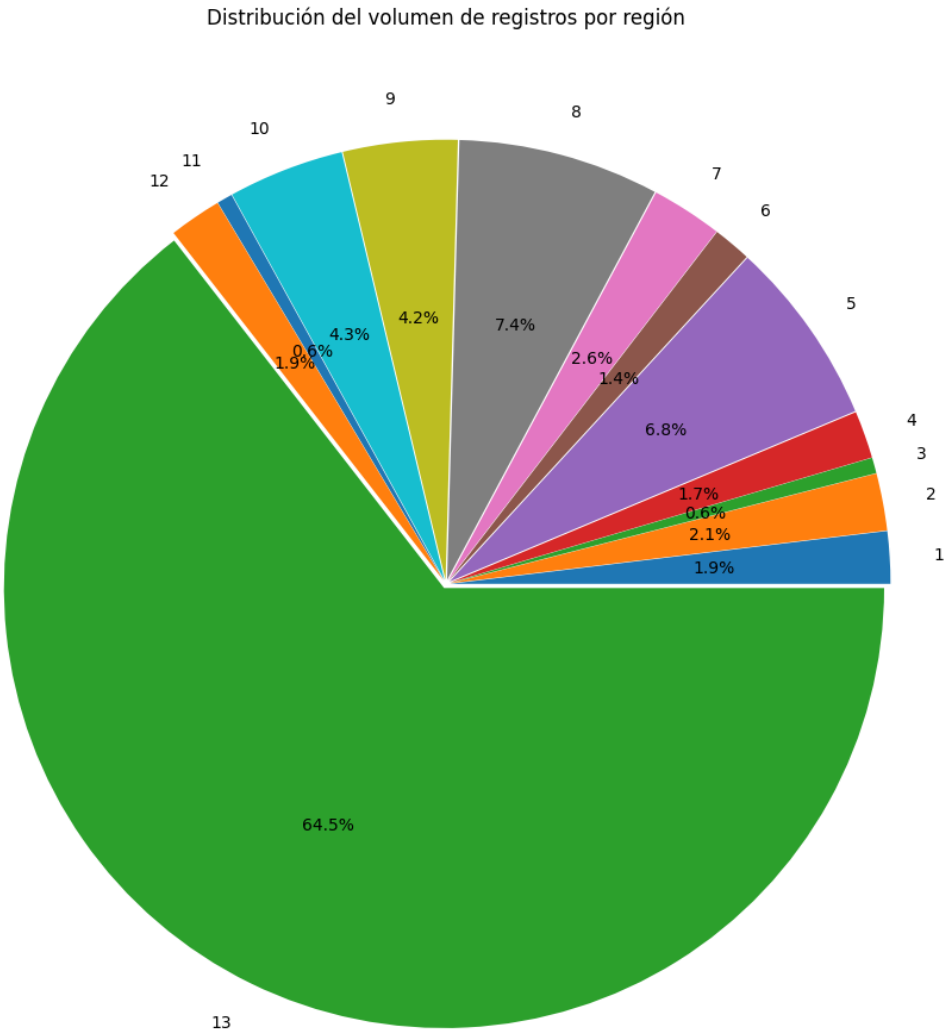
[77]:
```
array([13,  9, 10,  8,  7,  6,  5, 12, 11,  4,  1,  2,  3])
```

4.0.11 Y seleccionados los rangos que se mostrarán en el gráfico.

[78]:
```
# Los gráficos de torta contarán el número datos entre los rangos y lo␣
 ↪mostraremos en un gráfico.
n1 = region.loc[region == 1].count()
n2 = region.loc[region == 2].count()
n3 = region.loc[region == 3].count()
n4 = region.loc[region == 4].count()
n5 = region.loc[region == 5].count()
n6 = region.loc[region == 6].count()
n7 = region.loc[region == 7].count()
n8 = region.loc[region == 8].count()
n9 = region.loc[region == 9].count()
n10 = region.loc[region == 10].count()
n11 = region.loc[region == 11].count()
n12 = region.loc[region == 12].count()
n13 = region.loc[region == 13].count()
print(n1,n2,n3,n4,n5,n6,n7,n8,n9,n10,n11,n12,n13)
```

```
979 1072 294 889 3489 718 1331 3768 2143 2177 291 985 32935
```

[79]:
```
#Formato del grafico circular
datos = [n1,n2,n3,n4,n5,n6,n7,n8,n9,n10,n11,n12,n13]

# Separación de cada trozo de la torta al centro
exp = [0.01, 0.01, 0.01, 0.01, 0.01, 0.01, 0.01, 0.01, 0.01, 0.01, 0.01, 0.01,␣
 ↪0.01]

# Etiquetas de cada trozo
m = ["1","2","3","4","5","6","7","8","9","10","11","12","13"]

plt.figure(figsize=(12,12))

plt.title("Distribución del volumen de registros por región")
plt.pie(datos, labels = m, explode = exp, autopct='%2.1f%%')
plt.show()
```



5 Fase 3 - Data Preparation

En la fase de Preparación de Datos consiste en transformar los datos crudos en un formato apto para análisis y modelado. Esto implica limpiar los datos (corrigiendo errores, completando valores faltantes), transformarlos (normalizando, estandarizando), construir muestras representativas y crear nuevas variables si es necesario.

Como pudimos apreciar anteriormente, todas las columnas poseen datos tipo object, por lo tanto, tenemos que transformar cada columna a su mejor tipo de dato. *IMPORTANTE* Por ahora vamos a trabajar solamente con algunas cuantas columnas que utilizaremos para hacer un tipo de testeo de imputación de datos, además de hacer un pequeño análisis antes de explorar todos los datos como conjunto.

[80]:
```
# Crear una copia del DataFrame para modificar los tipos de datos
df_nuevos_dtype = df_acotado.copy()

# Columnas que deben ser enteros
columnas_enteros = [
    'Id', 'Edad', 'Region', 'TC', 'Cuentas', 'Hipotecario',
    'Consumo', 'Debito', 'Ctacte', 'Antiguedad', 'Dualidad', 'target'
]
for col in columnas_enteros:
    df_nuevos_dtype[col] = df_nuevos_dtype[col].astype('int64')

# Convertir columnas de tipo float64
columnas_flotantes = [col for col in df_nuevos_dtype.columns if col not in␣
 ↪columnas_enteros + ['Sexo', 'IndRev_T12', 'IndRev_T11', 'IndRev_T10',␣
 ↪'IndRev_T09', 'IndRev_T08', 'IndRev_T07', 'IndRev_T06', 'IndRev_T05',␣
 ↪'IndRev_T04', 'IndRev_T03', 'IndRev_T02', 'IndRev_T01']]
df_nuevos_dtype[columnas_flotantes] = df_nuevos_dtype[columnas_flotantes].
 ↪astype('float64')

# Convertir columnas de tipo object
columnas_objeto = ['Sexo', 'IndRev_T12', 'IndRev_T11', 'IndRev_T10',␣
 ↪'IndRev_T09', 'IndRev_T08', 'IndRev_T07', 'IndRev_T06', 'IndRev_T05',␣
 ↪'IndRev_T04', 'IndRev_T03', 'IndRev_T02', 'IndRev_T01']
df_nuevos_dtype[columnas_objeto] = df_nuevos_dtype[columnas_objeto].
 ↪astype('object')

# Verificar tipos de datos
for i in df_nuevos_dtype:
    print(f"{i} = {df_nuevos_dtype[i].dtype} \n")
```

```
Id = int64

Edad = int64

Renta = float64

Region = int64

Sexo = object

TC = int64

Cuentas = int64

Hipotecario = int64

Consumo = int64
```

```
Debito = int64

Ctacte = int64

Antiguedad = int64

Dualidad = int64

FacCN_T01 = float64

FacCN_T02 = float64

FacCN_T03 = float64

FacCN_T04 = float64

FacCN_T05 = float64

FacCN_T06 = float64

FacCN_T07 = float64

FacCN_T08 = float64

FacCN_T09 = float64

FacCN_T10 = float64

FacCN_T11 = float64

FacCN_T12 = float64

FacCI_T01 = float64

FacCI_T02 = float64

FacCI_T03 = float64

FacCI_T04 = float64

FacCI_T05 = float64

FacCI_T06 = float64

FacCI_T07 = float64

FacCI_T08 = float64
```

```
FacCI_T09 = float64

FacCI_T10 = float64

FacCI_T11 = float64

FacCI_T12 = float64

TxsCN_T01 = float64

TxsCN_T02 = float64

TxsCN_T03 = float64

TxsCN_T04 = float64

TxsCN_T05 = float64

TxsCN_T06 = float64

TxsCN_T07 = float64

TxsCN_T08 = float64

TxsCN_T09 = float64

TxsCN_T10 = float64

TxsCN_T11 = float64

TxsCN_T12 = float64

TxsCI_T01 = float64

TxsCI_T02 = float64

TxsCI_T03 = float64

TxsCI_T04 = float64

TxsCI_T05 = float64

TxsCI_T06 = float64

TxsCI_T07 = float64

TxsCI_T08 = float64
```

```
TxsCI_T09 = float64

TxsCI_T10 = float64

TxsCI_T11 = float64

TxsCI_T12 = float64

UsoL1_T01 = float64

UsoL1_T02 = float64

UsoL1_T03 = float64

UsoL1_T04 = float64

UsoL1_T05 = float64

UsoL1_T06 = float64

UsoL1_T07 = float64

UsoL1_T08 = float64

UsoL1_T09 = float64

UsoL1_T10 = float64

UsoL1_T11 = float64

UsoL1_T12 = float64

UsoLI_T01 = float64

UsoLI_T02 = float64

UsoLI_T03 = float64

UsoLI_T04 = float64

UsoLI_T05 = float64

UsoLI_T06 = float64

UsoLI_T07 = float64

UsoLI_T08 = float64
```

```
UsoLI_T09 = float64

UsoLI_T10 = float64

UsoLI_T11 = float64

UsoLI_T12 = float64

CUPO_L1 = float64

CUPO_MX = float64

PagoNac_T01 = float64

PagoNac_T02 = float64

PagoNac_T03 = float64

PagoNac_T04 = float64

PagoNac_T05 = float64

PagoNac_T06 = float64

PagoNac_T07 = float64

PagoNac_T08 = float64

PagoNac_T09 = float64

PagoNac_T10 = float64

PagoNac_T11 = float64

PagoNac_T12 = float64

PagoInt_T01 = float64

PagoInt_T02 = float64

PagoInt_T03 = float64

PagoInt_T04 = float64

PagoInt_T05 = float64

PagoInt_T06 = float64
```

```
PagoInt_T07 = float64

PagoInt_T08 = float64

PagoInt_T09 = float64

PagoInt_T10 = float64

PagoInt_T11 = float64

PagoInt_T12 = float64

FlgAct_T01 = float64

FlgAct_T02 = float64

FlgAct_T03 = float64

FlgAct_T04 = float64

FlgAct_T05 = float64

FlgAct_T06 = float64

FlgAct_T07 = float64

FlgAct_T08 = float64

FlgAct_T09 = float64

FlgAct_T10 = float64

FlgAct_T11 = float64

FlgAct_T12 = float64

FacAN_T01 = float64

FacAN_T02 = float64

FacAN_T03 = float64

FacAN_T04 = float64

FacAN_T05 = float64

FacAN_T06 = float64
```

```
FacAN_T07 = float64

FacAN_T08 = float64

FacAN_T09 = float64

FacAN_T10 = float64

FacAN_T11 = float64

FacAN_T12 = float64

FacAI_T01 = float64

FacAI_T02 = float64

FacAI_T03 = float64

FacAI_T04 = float64

FacAI_T05 = float64

FacAI_T06 = float64

FacAI_T07 = float64

FacAI_T08 = float64

FacAI_T09 = float64

FacAI_T10 = float64

FacAI_T11 = float64

FacAI_T12 = float64

target = int64

IndRev_T12 = object

IndRev_T11 = object

IndRev_T10 = object

IndRev_T09 = object

IndRev_T08 = object
```

```
IndRev_T07 = object

IndRev_T06 = object

IndRev_T05 = object

IndRev_T04 = object

IndRev_T03 = object

IndRev_T02 = object

IndRev_T01 = object
```

5.0.1 [MODIFICAR] Ahora vamos a eliminar todas las filas que contengan valor nulo en la columna "Renta" y en la columna "Region", ya que según contexto, todos los clientes ingresados en el Dataset original, tienen alguna relación con la tenencia de tarjeta de crédito, la cual tiene como por prerrequisito, tener una renta mínima en el sistema.

5.0.2 Tomaremos a la Región 13, ya que concentra la mayor cantidad de datos.

[81]:
```
#df_limpio = df_nuevos_dtype.dropna(subset=['Renta'])
#df_limpio = df_nuevos_dtype['Renta'].dropna(inplace=True)

df_acotado_x_region = df_nuevos_dtype[df_nuevos_dtype['Region'] == 13]
```

[82]:
```
for d in df_acotado_x_region:
    print(f"{d} = {df_acotado_x_region[d].info()} \n")
    print(f"{d} = {df_acotado_x_region[d].describe()} \n")

df_acotado_x_region.head(25)
```

```
<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: Id
Non-Null Count  Dtype
--------------  -----
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
Id = None

Id = count    32935.000000
mean     25422.027478
std      14808.382727
```

```
min          1.000000
25%      12640.500000
50%      25031.000000
75%      38561.500000
max      51124.000000
Name: Id, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: Edad
Non-Null Count  Dtype
--------------  -----
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
Edad = None

Edad = count    32935.000000
mean        38.897161
std         13.204920
min         19.000000
25%         29.000000
50%         35.000000
75%         46.000000
max         97.000000
Name: Edad, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: Renta
Non-Null Count  Dtype
--------------  -----
25163 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
Renta = None

Renta = count    2.516300e+04
mean     6.667516e+05
std      4.001187e+05
min      1.000000e+00
25%      4.209665e+05
50%      5.711190e+05
75%      8.188455e+05
max      8.870997e+06
Name: Renta, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: Region
Non-Null Count  Dtype
--------------  -----
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
Region = None

Region = count    32935.0
mean         13.0
std           0.0
min          13.0
25%          13.0
50%          13.0
75%          13.0
max          13.0
Name: Region, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: Sexo
Non-Null Count  Dtype
--------------  -----
32935 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
Sexo = None

Sexo = count     32935
unique         2
top            H
freq       17490
Name: Sexo, dtype: object

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TC
Non-Null Count  Dtype
--------------  -----
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
TC = None

TC = count    32935.000000
mean          1.774677
std           0.902230
```

```
min          1.000000
25%          1.000000
50%          2.000000
75%          2.000000
max         12.000000
Name: TC, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: Cuentas
Non-Null Count  Dtype
--------------  -----
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
Cuentas = None

Cuentas = count    32935.000000
mean         1.403613
std          0.547711
min          1.000000
25%          1.000000
50%          1.000000
75%          2.000000
max          5.000000
Name: Cuentas, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: Hipotecario
Non-Null Count  Dtype
--------------  -----
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
Hipotecario = None

Hipotecario = count    32935.000000
mean         0.140033
std          0.347027
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max          1.000000
Name: Hipotecario, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: Consumo
Non-Null Count  Dtype
--------------  -----
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
Consumo = None

Consumo = count    32935.000000
mean         0.000789
std          0.028086
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max          1.000000
Name: Consumo, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: Debito
Non-Null Count  Dtype
--------------  -----
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
Debito = None

Debito = count    32935.000000
mean         0.868347
std          0.338119
min          0.000000
25%          1.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: Debito, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: Ctacte
Non-Null Count  Dtype
--------------  -----
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
Ctacte = None
```

```
Ctacte = count    32935.000000
mean         0.913496
std          0.281111
min          0.000000
25%          1.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: Ctacte, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: Antiguedad
Non-Null Count  Dtype
--------------  -----
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
Antiguedad = None

Antiguedad = count    32935.000000
mean        40.378503
std         36.683227
min          6.000000
25%         14.000000
50%         26.000000
75%         57.000000
max        324.000000
Name: Antiguedad, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: Dualidad
Non-Null Count  Dtype
--------------  -----
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
Dualidad = None

Dualidad = count    32935.000000
mean         0.378655
std          0.485059
min          0.000000
25%          0.000000
50%          0.000000
75%          1.000000
```

```
max          1.000000
Name: Dualidad, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCN_T01
Non-Null Count  Dtype
--------------  -----
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T01 = None

FacCN_T01 = count    3.293500e+04
mean     6.057718e+04
std      1.206070e+05
min     -7.850000e+04
25%      0.000000e+00
50%      1.700000e+04
75%      7.589500e+04
max      2.820920e+06
Name: FacCN_T01, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCN_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T02 = None

FacCN_T02 = count    3.292500e+04
mean     6.808865e+04
std      1.320836e+05
min     -3.377790e+05
25%      0.000000e+00
50%      2.300700e+04
75%      8.522800e+04
max      5.900000e+06
Name: FacCN_T02, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCN_T03
Non-Null Count  Dtype
--------------  -----
```

```
32927 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T03 = None

FacCN_T03 = count    3.292700e+04
mean     7.202346e+04
std      1.404146e+05
min     -2.923440e+05
25%      0.000000e+00
50%      2.633400e+04
75%      9.302700e+04
max      9.340500e+06
Name: FacCN_T03, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCN_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T04 = None

FacCN_T04 = count    3.292200e+04
mean     6.679262e+04
std      1.231974e+05
min     -2.331900e+05
25%      0.000000e+00
50%      2.300000e+04
75%      8.563875e+04
max      4.219445e+06
Name: FacCN_T04, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCN_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T05 = None

FacCN_T05 = count    3.291700e+04
mean     5.576712e+04
std      1.070122e+05
```

```
min     -8.900000e+05
25%      0.000000e+00
50%      1.600000e+04
75%      7.000000e+04
max      2.903625e+06
Name: FacCN_T05, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCN_T06
Non-Null Count  Dtype
--------------  -----
32906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T06 = None

FacCN_T06 = count    3.290600e+04
mean     6.417361e+04
std      1.225011e+05
min     -4.634800e+05
25%      0.000000e+00
50%      2.040350e+04
75%      8.018300e+04
max      3.874900e+06
Name: FacCN_T06, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCN_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T07 = None

FacCN_T07 = count    3.240400e+04
mean     6.911133e+04
std      1.184052e+05
min     -1.963660e+05
25%      0.000000e+00
50%      2.799000e+04
75%      9.130975e+04
max      3.050624e+06
Name: FacCN_T07, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: FacCN_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T08 = None

FacCN_T08 = count    3.159400e+04
mean     5.888602e+04
std      1.101951e+05
min     -3.823700e+05
25%      0.000000e+00
50%      1.896000e+04
75%      7.427300e+04
max      2.364120e+06
Name: FacCN_T08, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCN_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T09 = None

FacCN_T09 = count    3.058500e+04
mean     6.076752e+04
std      1.188408e+05
min     -4.189000e+04
25%      0.000000e+00
50%      1.991300e+04
75%      7.600000e+04
max      4.057749e+06
Name: FacCN_T09, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCN_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T10 = None
```

```
FacCN_T10 = count    2.974400e+04
mean     5.572744e+04
std      1.104565e+05
min     -6.652300e+04
25%      0.000000e+00
50%      1.500000e+04
75%      6.800250e+04
max      2.861687e+06
Name: FacCN_T10, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCN_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T11 = None

FacCN_T11 = count    2.890600e+04
mean     5.862798e+04
std      1.120637e+05
min     -1.784500e+05
25%      0.000000e+00
50%      1.901500e+04
75%      7.293150e+04
max      2.342818e+06
Name: FacCN_T11, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCN_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCN_T12 = None

FacCN_T12 = count    2.791800e+04
mean     5.857932e+04
std      1.129350e+05
min     -4.800000e+05
25%      0.000000e+00
50%      1.666250e+04
75%      7.353900e+04
```

```
max      3.000000e+06
Name: FacCN_T12, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCI_T01
Non-Null Count  Dtype
--------------  -----
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T01 = None

FacCI_T01 = count    3.293500e+04
mean     5.862252e+03
std      5.791416e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      4.166432e+06
Name: FacCI_T01, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCI_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T02 = None

FacCI_T02 = count    3.292500e+04
mean     6.431176e+03
std      5.648929e+04
min     -1.450700e+04
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.299676e+06
Name: FacCI_T02, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCI_T03
Non-Null Count  Dtype
--------------  -----
```

```
32927 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T03 = None

FacCI_T03 = count    3.292700e+04
mean     5.852998e+03
std      5.075069e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.451660e+06
Name: FacCI_T03, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCI_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T04 = None

FacCI_T04 = count    3.292200e+04
mean     6.038785e+03
std      5.671651e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      3.923086e+06
Name: FacCI_T04, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCI_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T05 = None

FacCI_T05 = count    3.291700e+04
mean     6.715521e+03
std      5.053683e+04
```

```
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.338298e+06
Name: FacCI_T05, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCI_T06
Non-Null Count  Dtype
--------------  -----
32906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T06 = None

FacCI_T06 = count    3.290600e+04
mean     5.330882e+03
std      4.808372e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.833004e+06
Name: FacCI_T06, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCI_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T07 = None

FacCI_T07 = count    3.240400e+04
mean     4.261273e+03
std      3.977057e+04
min     -2.121400e+04
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.778558e+06
Name: FacCI_T07, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: FacCI_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T08 = None

FacCI_T08 = count    3.159400e+04
mean     5.183116e+03
std      5.448719e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      3.574102e+06
Name: FacCI_T08, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCI_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T09 = None

FacCI_T09 = count    3.058500e+04
mean     5.233107e+03
std      4.546165e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.492212e+06
Name: FacCI_T09, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCI_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T10 = None
```

```
FacCI_T10 = count    2.974400e+04
mean     5.432746e+03
std      4.906979e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.735124e+06
Name: FacCI_T10, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCI_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T11 = None

FacCI_T11 = count    2.890600e+04
mean     5.084037e+03
std      5.293889e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      3.393667e+06
Name: FacCI_T11, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacCI_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacCI_T12 = None

FacCI_T12 = count    2.791800e+04
mean     4.481376e+03
std      4.522847e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
```

```
max      2.038296e+06
Name: FacCI_T12, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T01
Non-Null Count  Dtype
--------------  -----
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T01 = None

TxsCN_T01 = count    32935.000000
mean         2.133718
std          3.459607
min         -1.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         92.000000
Name: TxsCN_T01, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T02 = None

TxsCN_T02 = count    32925.000000
mean         2.354472
std          3.681130
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         94.000000
Name: TxsCN_T02, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T03
Non-Null Count  Dtype
--------------  -----
```

```
32927 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T03 = None

TxsCN_T03 = count    32927.000000
mean         2.415313
std          3.656638
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         41.000000
Name: TxsCN_T03, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T04 = None

TxsCN_T04 = count    32922.000000
mean         2.277687
std          3.519090
min         -1.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         48.000000
Name: TxsCN_T04, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T05 = None

TxsCN_T05 = count    32917.000000
mean         2.134125
std          3.483032
```

```
min         -1.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         50.000000
Name: TxsCN_T05, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T06
Non-Null Count  Dtype
--------------  -----
32906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T06 = None

TxsCN_T06 = count    32906.000000
mean         2.372121
std          3.779230
min         -3.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         65.000000
Name: TxsCN_T06, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T07 = None

TxsCN_T07 = count    32404.000000
mean         2.635539
std          3.845710
min         -1.000000
25%          0.000000
50%          1.000000
75%          4.000000
max         51.000000
Name: TxsCN_T07, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T08 = None

TxsCN_T08 = count    31594.000000
mean         2.201082
std          3.428316
min         -1.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         49.000000
Name: TxsCN_T08, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T09 = None

TxsCN_T09 = count    30585.000000
mean         2.280007
std          3.559048
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         53.000000
Name: TxsCN_T09, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T10 = None
```

```
TxsCN_T10 = count    29744.000000
mean         1.980063
std          3.157954
min         -1.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         45.000000
Name: TxsCN_T10, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T11 = None

TxsCN_T11 = count    28906.000000
mean         2.238878
std          3.512853
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
max         55.000000
Name: TxsCN_T11, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCN_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCN_T12 = None

TxsCN_T12 = count    27918.000000
mean         2.217745
std          3.532802
min         -2.000000
25%          0.000000
50%          1.000000
75%          3.000000
```

```
max         56.000000
Name: TxsCN_T12, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T01
Non-Null Count  Dtype
--------------  -----
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T01 = None

TxsCI_T01 = count    32935.000000
mean         0.134841
std          1.057096
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         55.000000
Name: TxsCI_T01, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T02 = None

TxsCI_T02 = count    32925.000000
mean         0.155444
std          1.158505
min         -1.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         86.000000
Name: TxsCI_T02, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T03
Non-Null Count  Dtype
--------------  -----
```

```
32927 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T03 = None

TxsCI_T03 = count    32927.000000
mean         0.144137
std          1.114285
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         90.000000
Name: TxsCI_T03, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T04 = None

TxsCI_T04 = count    32922.000000
mean         0.155003
std          1.172548
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max        100.000000
Name: TxsCI_T04, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T05 = None

TxsCI_T05 = count    32917.000000
mean         0.194307
std          1.140927
```

```
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         30.000000
Name: TxsCI_T05, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T06
Non-Null Count  Dtype
--------------  -----
32906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T06 = None

TxsCI_T06 = count    32906.000000
mean         0.135690
std          1.001733
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         53.000000
Name: TxsCI_T06, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T07 = None

TxsCI_T07 = count    32404.000000
mean         0.107456
std          0.790217
min         -1.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         33.000000
Name: TxsCI_T07, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T08 = None

TxsCI_T08 = count    31594.000000
mean         0.125119
std          1.007339
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         60.000000
Name: TxsCI_T08, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T09 = None

TxsCI_T09 = count    30585.000000
mean         0.134314
std          0.995810
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         48.000000
Name: TxsCI_T09, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T10 = None
```

```
TxsCI_T10 = count    29744.000000
mean         0.128429
std          0.950643
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         34.000000
Name: TxsCI_T10, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T11 = None

TxsCI_T11 = count    28906.000000
mean         0.117450
std          0.951155
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max         42.000000
Name: TxsCI_T11, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: TxsCI_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
TxsCI_T12 = None

TxsCI_T12 = count    27918.000000
mean         0.105989
std          0.868949
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
```

```
max         35.000000
Name: TxsCI_T12, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T01
Non-Null Count  Dtype
--------------  -----
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T01 = None

UsoL1_T01 = count    3.293500e+04
mean     1.884220e+05
std      2.955900e+05
min     -1.660208e+06
25%      1.661050e+04
50%      8.228700e+04
75%      2.331735e+05
max      6.911556e+06
Name: UsoL1_T01, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T02 = None

UsoL1_T02 = count    3.292500e+04
mean     1.838707e+05
std      2.906491e+05
min     -2.258860e+06
25%      1.511300e+04
50%      7.936500e+04
75%      2.297918e+05
max      6.171715e+06
Name: UsoL1_T02, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T03
Non-Null Count  Dtype
--------------  -----
```

```
32927 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T03 = None

UsoL1_T03 = count    3.292700e+04
mean     1.814357e+05
std      2.864506e+05
min     -2.176334e+06
25%      1.588800e+04
50%      7.814900e+04
75%      2.269960e+05
max      4.475465e+06
Name: UsoL1_T03, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T04 = None

UsoL1_T04 = count    3.292200e+04
mean     1.770810e+05
std      2.853039e+05
min     -2.442226e+06
25%      1.698850e+04
50%      7.518686e+04
75%      2.164612e+05
max      5.395336e+06
Name: UsoL1_T04, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T05 = None

UsoL1_T05 = count    3.291700e+04
mean     1.719006e+05
std      2.844403e+05
```

```
min     -2.675118e+06
25%      1.301800e+04
50%      7.063900e+04
75%      2.083550e+05
max      5.239425e+06
Name: UsoL1_T05, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T06
Non-Null Count  Dtype
--------------  -----
32906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T06 = None

UsoL1_T06 = count    3.290600e+04
mean     1.629118e+05
std      2.773604e+05
min     -2.979813e+06
25%      7.890500e+03
50%      6.299300e+04
75%      1.963730e+05
max      5.183758e+06
Name: UsoL1_T06, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T07 = None

UsoL1_T07 = count    3.240400e+04
mean     1.625959e+05
std      2.839996e+05
min     -6.218200e+06
25%      7.480500e+03
50%      6.222650e+04
75%      1.940510e+05
max      5.127393e+06
Name: UsoL1_T07, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T08 = None

UsoL1_T08 = count    3.159400e+04
mean     1.577584e+05
std      2.794453e+05
min     -2.004109e+06
25%      4.269500e+03
50%      5.535639e+04
75%      1.856460e+05
max      5.043719e+06
Name: UsoL1_T08, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T09 = None

UsoL1_T09 = count    3.058500e+04
mean     1.586364e+05
std      2.831925e+05
min     -2.549459e+06
25%      3.920000e+03
50%      5.474000e+04
75%      1.854100e+05
max      5.041216e+06
Name: UsoL1_T09, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T10 = None
```

```
UsoL1_T10 = count    2.974400e+04
mean     1.606887e+05
std      2.899351e+05
min     -4.456480e+06
25%      2.987250e+03
50%      5.477100e+04
75%      1.889168e+05
max      5.114986e+06
Name: UsoL1_T10, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T11 = None

UsoL1_T11 = count    2.890600e+04
mean     1.638364e+05
std      2.984229e+05
min     -4.299940e+06
25%      8.500000e+02
50%      5.438550e+04
75%      1.923282e+05
max      5.760108e+06
Name: UsoL1_T11, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoL1_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoL1_T12 = None

UsoL1_T12 = count    2.791800e+04
mean     1.715886e+05
std      3.056938e+05
min     -1.839433e+06
25%      1.924000e+03
50%      5.715250e+04
75%      2.040842e+05
```

```
max      5.599215e+06
Name: UsoL1_T12, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T01
Non-Null Count  Dtype
--------------  -----
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T01 = None

UsoLI_T01 = count    32935.000000
mean         9.477174
std        119.328918
min      -7785.120000
25%          0.000000
50%          0.000000
75%          0.000000
max       3929.810000
Name: UsoLI_T01, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T02 = None

UsoLI_T02 = count    32925.00000
mean        10.44170
std        116.85221
min      -5831.13000
25%          0.00000
50%          0.00000
75%          0.00000
max       3494.74000
Name: UsoLI_T02, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T03
Non-Null Count  Dtype
--------------  -----
```

```
32927 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T03 = None

UsoLI_T03 = count    32927.000000
mean        10.386605
std        106.272486
min      -3226.290000
25%          0.000000
50%          0.000000
75%          0.000000
max       5191.140000
Name: UsoLI_T03, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T04 = None

UsoLI_T04 = count    32922.000000
mean        10.693953
std        101.625199
min      -2985.640000
25%          0.000000
50%          0.000000
75%          0.000000
max       4972.350000
Name: UsoLI_T04, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T05 = None

UsoLI_T05 = count    32917.000000
mean        13.055686
std        107.287543
```

```
min      -4662.220000
25%          0.000000
50%          0.000000
75%          0.000000
max       4329.620000
Name: UsoLI_T05, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T06
Non-Null Count  Dtype
--------------  -----
32906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T06 = None

UsoLI_T06 = count    32906.000000
mean         8.745149
std         94.178551
min      -4068.350000
25%          0.000000
50%          0.000000
75%          0.000000
max       3261.860000
Name: UsoLI_T06, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T07 = None

UsoLI_T07 = count    32404.000000
mean         7.592494
std         78.600764
min      -2596.150000
25%          0.000000
50%          0.000000
75%          0.000000
max       2558.700000
Name: UsoLI_T07, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T08 = None

UsoLI_T08 = count    31594.000000
mean         9.503608
std        108.546079
min      -2596.150000
25%          0.000000
50%          0.000000
75%          0.000000
max       6795.000000
Name: UsoLI_T08, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T09 = None

UsoLI_T09 = count    30585.000000
mean         9.354334
std         90.670068
min      -2592.000000
25%          0.000000
50%          0.000000
75%          0.000000
max       2609.990000
Name: UsoLI_T09, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T10 = None
```

```
UsoLI_T10 = count    29744.000000
mean         9.298412
std        100.910847
min      -4055.000000
25%          0.000000
50%          0.000000
75%          0.000000
max       3223.820000
Name: UsoLI_T10, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T11 = None

UsoLI_T11 = count    28906.000000
mean         8.979992
std        100.736984
min      -1658.800000
25%          0.000000
50%          0.000000
75%          0.000000
max       6310.630000
Name: UsoLI_T11, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: UsoLI_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
UsoLI_T12 = None

UsoLI_T12 = count    27918.000000
mean         8.817660
std         95.468009
min      -2940.000000
25%          0.000000
50%          0.000000
75%          0.000000
```

```
max       3778.750000
Name: UsoLI_T12, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: CUPO_L1
Non-Null Count  Dtype
--------------  -----
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
CUPO_L1 = None

CUPO_L1 = count    3.293500e+04
mean     1.164242e+06
std      1.074405e+06
min      0.000000e+00
25%      4.290000e+05
50%      8.470000e+05
75%      1.569250e+06
max      1.740000e+07
Name: CUPO_L1, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: CUPO_MX
Non-Null Count  Dtype
--------------  -----
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
CUPO_MX = None

CUPO_MX = count    32935.000000
mean      1450.414483
std       1617.887384
min          0.000000
25%        400.000000
50%       1000.000000
75%       2000.000000
max      40000.000000
Name: CUPO_MX, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T01
Non-Null Count  Dtype
--------------  -----
```

```
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T01 = None

PagoNac_T01 = count    3.293500e+04
mean     7.869709e+04
std      1.469553e+05
min      0.000000e+00
25%      5.000000e+03
50%      3.600000e+04
75%      9.800000e+04
max      5.905317e+06
Name: PagoNac_T01, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T02 = None

PagoNac_T02 = count    3.292500e+04
mean     8.185484e+04
std      1.493398e+05
min      0.000000e+00
25%      7.000000e+03
50%      3.906200e+04
75%      1.000000e+05
max      3.912000e+06
Name: PagoNac_T02, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T03
Non-Null Count  Dtype
--------------  -----
32927 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T03 = None

PagoNac_T03 = count    3.292700e+04
mean     7.256918e+04
std      1.619823e+05
```

```
min      0.000000e+00
25%      3.857500e+03
50%      3.100000e+04
75%      8.641950e+04
max      1.020000e+07
Name: PagoNac_T03, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T04 = None

PagoNac_T04 = count    3.292200e+04
mean     7.926037e+04
std      1.578543e+05
min      0.000000e+00
25%      6.000000e+03
50%      3.687300e+04
75%      9.660250e+04
max      6.363388e+06
Name: PagoNac_T04, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T05 = None

PagoNac_T05 = count    3.291700e+04
mean     6.826348e+04
std      1.357048e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.934000e+04
75%      8.267200e+04
max      4.716979e+06
Name: PagoNac_T05, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T06
Non-Null Count  Dtype
--------------  -----
32906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T06 = None

PagoNac_T06 = count    3.290600e+04
mean     7.636858e+04
std      1.529147e+05
min      0.000000e+00
25%      0.000000e+00
50%      3.200000e+04
75%      9.286725e+04
max      6.551506e+06
Name: PagoNac_T06, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T07 = None

PagoNac_T07 = count    3.240400e+04
mean     6.934970e+04
std      1.516912e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.758100e+04
75%      8.200000e+04
max      7.960968e+06
Name: PagoNac_T07, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T08 = None
```

```
PagoNac_T08 = count    3.159400e+04
mean     6.958947e+04
std      1.594257e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.821950e+04
75%      8.209375e+04
max      8.530346e+06
Name: PagoNac_T08, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T09 = None

PagoNac_T09 = count    3.058500e+04
mean     7.057360e+04
std      1.591340e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.897100e+04
75%      8.185300e+04
max      8.016817e+06
Name: PagoNac_T09, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T10 = None

PagoNac_T10 = count    2.974400e+04
mean     6.908711e+04
std      1.639857e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.500000e+04
75%      8.000000e+04
```

```
max      5.015501e+06
Name: PagoNac_T10, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T11 = None

PagoNac_T11 = count    2.890600e+04
mean     7.466965e+04
std      1.708804e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.700000e+04
75%      8.698275e+04
max      7.269455e+06
Name: PagoNac_T11, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoNac_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoNac_T12 = None

PagoNac_T12 = count    2.791800e+04
mean     7.627538e+04
std      1.853378e+05
min      0.000000e+00
25%      0.000000e+00
50%      2.858150e+04
75%      8.842150e+04
max      7.897665e+06
Name: PagoNac_T12, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T01
Non-Null Count  Dtype
--------------  -----
```

```
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T01 = None

PagoInt_T01 = count    3.293500e+04
mean     1.832949e+03
std      4.019534e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      4.219680e+06
Name: PagoInt_T01, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T02 = None

PagoInt_T02 = count    3.292500e+04
mean     1.888883e+03
std      4.415391e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      4.616855e+06
Name: PagoInt_T02, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T03
Non-Null Count  Dtype
--------------  -----
32927 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T03 = None

PagoInt_T03 = count    3.292700e+04
mean     1.695726e+03
std      3.415503e+04
```

```
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.412445e+06
Name: PagoInt_T03, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T04 = None

PagoInt_T04 = count    3.292200e+04
mean     1.976501e+03
std      4.139158e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      4.314960e+06
Name: PagoInt_T04, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T05 = None

PagoInt_T05 = count    3.291700e+04
mean     1.431243e+03
std      3.282060e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      3.920190e+06
Name: PagoInt_T05, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T06
Non-Null Count  Dtype
--------------  -----
32906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T06 = None

PagoInt_T06 = count    3.290600e+04
mean     2.136008e+03
std      1.277310e+05
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.251048e+07
Name: PagoInt_T06, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T07 = None

PagoInt_T07 = count    3.240400e+04
mean     1.368164e+03
std      2.659435e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.953964e+06
Name: PagoInt_T07, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T08 = None
```

```
PagoInt_T08 = count    3.159400e+04
mean     1.628287e+03
std      2.934176e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.746657e+06
Name: PagoInt_T08, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T09 = None

PagoInt_T09 = count    3.058500e+04
mean     1.675578e+03
std      3.012083e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.577970e+06
Name: PagoInt_T09, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T10 = None

PagoInt_T10 = count    2.974400e+04
mean     1.829930e+03
std      3.580785e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
```

```
max      2.182482e+06
Name: PagoInt_T10, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T11 = None

PagoInt_T11 = count    2.890600e+04
mean     1.710084e+03
std      2.887890e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.838356e+06
Name: PagoInt_T11, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: PagoInt_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
PagoInt_T12 = None

PagoInt_T12 = count    2.791800e+04
mean     8.069396e+03
std      1.062012e+06
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.773575e+08
Name: PagoInt_T12, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T01
Non-Null Count  Dtype
--------------  -----
```

```
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T01 = None

FlgAct_T01 = count    32935.000000
mean         0.668681
std          0.470695
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T01, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T02 = None

FlgAct_T02 = count    32925.000000
mean         0.702141
std          0.457324
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T02, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T03
Non-Null Count  Dtype
--------------  -----
32927 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T03 = None

FlgAct_T03 = count    32927.000000
mean         0.713487
std          0.452139
```

```
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T03, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T04 = None

FlgAct_T04 = count    32922.000000
mean         0.700352
std          0.458111
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T04, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T05 = None

FlgAct_T05 = count    32917.000000
mean         0.678829
std          0.466934
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T05, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T06
Non-Null Count  Dtype
--------------  -----
32906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T06 = None

FlgAct_T06 = count    32906.000000
mean         0.695132
std          0.460359
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T06, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T07 = None

FlgAct_T07 = count    32404.000000
mean         0.712042
std          0.452819
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T07, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T08 = None
```

```
FlgAct_T08 = count    31594.000000
mean         0.679718
std          0.466592
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T08, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T09 = None

FlgAct_T09 = count    30585.000000
mean         0.685499
std          0.464324
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T09, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T10 = None

FlgAct_T10 = count    29744.000000
mean         0.662251
std          0.472950
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
```

```
max          1.000000
Name: FlgAct_T10, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T11 = None

FlgAct_T11 = count    28906.000000
mean         0.679651
std          0.466619
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T11, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FlgAct_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FlgAct_T12 = None

FlgAct_T12 = count    27918.000000
mean         0.669461
std          0.470416
min          0.000000
25%          0.000000
50%          1.000000
75%          1.000000
max          1.000000
Name: FlgAct_T12, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAN_T01
Non-Null Count  Dtype
--------------  -----
```

```
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T01 = None

FacAN_T01 = count    3.293500e+04
mean     2.337588e+03
std      2.489462e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.700000e+06
Name: FacAN_T01, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAN_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T02 = None

FacAN_T02 = count    3.292500e+04
mean     2.200226e+03
std      2.294765e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.500000e+06
Name: FacAN_T02, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAN_T03
Non-Null Count  Dtype
--------------  -----
32927 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T03 = None

FacAN_T03 = count     32927.000000
mean       1885.164030
std       18610.598955
```

```
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      947944.000000
Name: FacAN_T03, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAN_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T04 = None

FacAN_T04 = count      32922.000000
mean        1811.051030
std        18903.359654
min            0.000000
25%            0.000000
50%            0.000000
75%            0.000000
max      1000000.000000
Name: FacAN_T04, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAN_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T05 = None

FacAN_T05 = count     32917.000000
mean       1732.655345
std       17753.825383
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      800000.000000
Name: FacAN_T05, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: FacAN_T06
Non-Null Count  Dtype
--------------  -----
32906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T06 = None

FacAN_T06 = count      32906.000000
mean        1765.470401
std        18716.952250
min            0.000000
25%            0.000000
50%            0.000000
75%            0.000000
max      1000000.000000
Name: FacAN_T06, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAN_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T07 = None

FacAN_T07 = count     32404.000000
mean       1694.143316
std       20179.831902
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      900000.000000
Name: FacAN_T07, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAN_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T08 = None
```

```
FacAN_T08 = count    3.159400e+04
mean     1.756692e+03
std      1.872430e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.282500e+06
Name: FacAN_T08, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAN_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T09 = None

FacAN_T09 = count     30585.000000
mean       1388.143142
std       15017.328489
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      780000.000000
Name: FacAN_T09, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAN_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T10 = None

FacAN_T10 = count     29744.000000
mean       1322.220616
std       15301.761584
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
```

```
max      600000.000000
Name: FacAN_T10, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAN_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T11 = None

FacAN_T11 = count    2.890600e+04
mean     1.642265e+03
std      2.250889e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      2.000000e+06
Name: FacAN_T11, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAN_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAN_T12 = None

FacAN_T12 = count    2.791800e+04
mean     1.723435e+03
std      2.253894e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.547000e+06
Name: FacAN_T12, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAI_T01
Non-Null Count  Dtype
--------------  -----
```

```
32935 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T01 = None

FacAI_T01 = count    3.293500e+04
mean     4.166570e+02
std      1.257442e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.022866e+06
Name: FacAI_T01, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAI_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T02 = None

FacAI_T02 = count    3.292500e+04
mean     5.234342e+02
std      1.490586e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.105388e+06
Name: FacAI_T02, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAI_T03
Non-Null Count  Dtype
--------------  -----
32927 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T03 = None

FacAI_T03 = count    3.292700e+04
mean     5.327878e+02
std      1.381923e+04
```

```
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.067759e+06
Name: FacAI_T03, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAI_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T04 = None

FacAI_T04 = count    3.292200e+04
mean     7.585838e+02
std      1.899998e+04
min     -4.784800e+04
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
max      1.983505e+06
Name: FacAI_T04, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAI_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T05 = None

FacAI_T05 = count     32917.000000
mean        728.547346
std       13830.760980
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      852603.000000
Name: FacAI_T05, dtype: float64

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: FacAI_T06
Non-Null Count  Dtype
--------------  -----
32906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T06 = None

FacAI_T06 = count     32906.000000
mean        511.844428
std       12285.294221
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      856783.080800
Name: FacAI_T06, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAI_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T07 = None

FacAI_T07 = count     32404.000000
mean        304.367269
std        9564.132983
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      793935.000000
Name: FacAI_T07, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAI_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T08 = None
```

```
FacAI_T08 = count     31594.000000
mean        319.217921
std        9858.248324
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      718013.000000
Name: FacAI_T08, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAI_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T09 = None

FacAI_T09 = count     30585.000000
mean        321.018669
std        8988.280422
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      735897.000000
Name: FacAI_T09, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAI_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T10 = None

FacAI_T10 = count    2.974400e+04
mean     4.447238e+02
std      1.306373e+04
min      0.000000e+00
25%      0.000000e+00
50%      0.000000e+00
75%      0.000000e+00
```

```
max      1.269478e+06
Name: FacAI_T10, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAI_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T11 = None

FacAI_T11 = count     28906.000000
mean        332.445336
std       10522.777520
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      755496.939900
Name: FacAI_T11, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: FacAI_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  float64
dtypes: float64(1)
memory usage: 514.6 KB
FacAI_T12 = None

FacAI_T12 = count     27918.000000
mean        382.309301
std       10536.518314
min           0.000000
25%           0.000000
50%           0.000000
75%           0.000000
max      625170.795900
Name: FacAI_T12, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: target
Non-Null Count  Dtype
--------------  -----
```

```
32935 non-null  int64
dtypes: int64(1)
memory usage: 514.6 KB
target = None

target = count    32935.000000
mean         0.086048
std          0.280440
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max          1.000000
Name: target, dtype: float64

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: IndRev_T12
Non-Null Count  Dtype
--------------  -----
27918 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T12 = None

IndRev_T12 = count     27918
unique        3
top           R
freq      17557
Name: IndRev_T12, dtype: object

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: IndRev_T11
Non-Null Count  Dtype
--------------  -----
28906 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T11 = None

IndRev_T11 = count     28906
unique        3
top           R
freq      17980
Name: IndRev_T11, dtype: object

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: IndRev_T10
Non-Null Count  Dtype
--------------  -----
29744 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T10 = None

IndRev_T10 = count     29744
unique        3
top           R
freq      18859
Name: IndRev_T10, dtype: object

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: IndRev_T09
Non-Null Count  Dtype
--------------  -----
30585 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T09 = None

IndRev_T09 = count     30585
unique        3
top           R
freq      19445
Name: IndRev_T09, dtype: object

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: IndRev_T08
Non-Null Count  Dtype
--------------  -----
31594 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T08 = None

IndRev_T08 = count     31594
unique        3
top           R
freq      20494
Name: IndRev_T08, dtype: object

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: IndRev_T07
Non-Null Count  Dtype
--------------  -----
32404 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T07 = None

IndRev_T07 = count     32404
unique        3
top           R
freq      21874
Name: IndRev_T07, dtype: object

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: IndRev_T06
Non-Null Count  Dtype
--------------  -----
32903 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T06 = None

IndRev_T06 = count     32903
unique        3
top           R
freq      22361
Name: IndRev_T06, dtype: object

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: IndRev_T05
Non-Null Count  Dtype
--------------  -----
32917 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T05 = None

IndRev_T05 = count     32917
unique        3
top           R
freq      23847
Name: IndRev_T05, dtype: object

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: IndRev_T04
Non-Null Count  Dtype
--------------  -----
32922 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T04 = None

IndRev_T04 = count     32922
unique        3
top           R
freq      25098
Name: IndRev_T04, dtype: object

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: IndRev_T03
Non-Null Count  Dtype
--------------  -----
32927 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T03 = None

IndRev_T03 = count     32927
unique        3
top           R
freq      24256
Name: IndRev_T03, dtype: object

<class 'pandas.core.series.Series'>
Index: 32935 entries, 0 to 51123
Series name: IndRev_T02
Non-Null Count  Dtype
--------------  -----
32925 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T02 = None

IndRev_T02 = count     32925
unique        3
top           R
freq      23936
Name: IndRev_T02, dtype: object

<class 'pandas.core.series.Series'>
```

```
Index: 32935 entries, 0 to 51123
Series name: IndRev_T01
Non-Null Count  Dtype
--------------  -----
32935 non-null  object
dtypes: object(1)
memory usage: 514.6+ KB
IndRev_T01 = None

IndRev_T01 = count     32935
unique         3
top            R
freq       24533
Name: IndRev_T01, dtype: object
```

[82]:

0	Id	Edad	Renta	Region	Sexo	TC	Cuentas	Hipotecario	Consumo	\
0	1	43	NaN	13	M	3	1	0	0	
1	2	46	143640.0	13	H	1	1	1	0	
2	3	45	929106.0	13	H	2	1	1	0	
3	4	46	172447.0	13	H	2	1	0	0	
4	5	46	805250.0	13	H	3	2	1	0	
5	6	47	707664.0	13	H	2	1	0	0	
6	7	48	1022833.0	13	H	2	2	0	0	
7	8	46	NaN	13	H	3	2	0	0	
8	9	49	1171066.0	13	H	1	1	0	0	
9	10	44	964387.0	13	M	3	1	1	0	
10	11	38	NaN	13	M	1	1	1	0	
12	13	36	1263238.0	13	H	1	1	0	0	
14	15	48	592541.0	13	H	1	1	0	0	
15	16	46	NaN	13	H	2	2	0	0	
16	17	51	752396.0	13	M	2	2	0	0	
17	18	37	844830.0	13	H	1	1	1	0	
18	19	47	176712.0	13	M	1	1	1	0	
20	21	50	691615.0	13	M	2	1	0	0	
22	23	48	991751.0	13	H	1	1	0	0	
23	24	46	440339.0	13	H	1	1	0	0	
25	26	43	843556.0	13	H	4	2	0	0	
27	28	43	1309234.0	13	H	1	1	0	0	
28	29	45	1400000.0	13	M	1	1	0	0	
29	30	51	NaN	13	M	1	1	0	0	
31	32	47	NaN	13	H	1	1	0	0	

0	Debito	…	IndRev_T10	IndRev_T09	IndRev_T08	IndRev_T07	IndRev_T06	\
0	1	…	R	R	R	R	R	
1	0	…	R	R	R	R	R	
2	1	…	T	T	T	T	T	

3	0	…	R	R	R	R	R
4	0	…	T	T	T	T	T
5	1	…	R	T	T	R	R
6	1	…	R	R	R	R	R
7	1	…	T	P	R	R	R
8	1	…	R	R	R	R	R
9	1	…	R	R	R	R	R
10	0	…	T	P	P	P	P
12	1	…	None	None	None	R	R
14	1	…	R	R	R	R	R
15	1	…	None	None	P	T	R
16	1	…	R	R	T	T	T
17	1	…	P	R	R	R	R
18	1	…	P	R	T	T	R
20	1	…	R	R	R	R	R
22	1	…	R	R	R	R	R
23	1	…	R	R	R	R	R
25	1	…	R	R	R	R	R
27	1	…	P	T	R	R	R
28	0	…	R	R	R	R	R
29	0	…	P	P	P	T	R
31	1	…	P	T	R	R	R

0	IndRev_T05	IndRev_T04	IndRev_T03	IndRev_T02	IndRev_T01
0	R	R	R	R	R
1	R	R	R	R	R
2	T	T	T	T	T
3	R	R	R	R	R
4	T	T	R	T	R
5	R	T	P	R	R
6	R	R	R	R	T
7	R	R	R	R	R
8	R	R	R	R	R
9	R	R	R	R	R
10	P	P	P	T	T
12	R	R	R	R	R
14	R	R	R	R	R
15	R	R	R	R	R
16	T	T	R	R	R
17	R	P	P	P	P
18	R	R	P	P	P
20	R	R	R	R	R
22	R	R	R	R	R
23	T	R	R	R	R
25	R	R	R	R	R
27	R	R	R	R	R
28	R	R	R	T	R

```
29          R          R          R          R          R
31          R          T          P          T          R

[25 rows x 160 columns]
```

5.0.3 Vamos a dejar afuera algunas variables que no utilizaremos.

[83]:
```
#cantidad_nan_renta = df_acotado_x_region['Renta'].isnull().sum()
##cantidad_nan_region = df_acotado_x_region['Region'].isnull().sum()
#print("Cantidad de NaN en Renta:", cantidad_nan_renta)
#print("Cantidad de NaN en Region:", cantidad_nan_renta)


df_acotado_x_region = df_acotado_x_region.drop(df_acotado_x_region[['Dualidad',␣
 ↪'Consumo', 'Ctacte', 'Debito', 'Hipotecario',
'FacCN_T01', 'FacCN_T02', 'FacCN_T03', 'FacCN_T04', 'FacCN_T05', 'FacCN_T06',␣
 ↪'FacCN_T07', 'FacCN_T08', 'FacCN_T09', 'FacCN_T10', 'FacCN_T11', 'FacCN_T12',
'FacCI_T01', 'FacCI_T02', 'FacCI_T03', 'FacCI_T04', 'FacCI_T05', 'FacCI_T06',␣
 ↪'FacCI_T07', 'FacCI_T08', 'FacCI_T09', 'FacCI_T10', 'FacCI_T11', 'FacCI_T12',
'TxsCN_T01', 'TxsCN_T02', 'TxsCN_T03', 'TxsCN_T04', 'TxsCN_T05', 'TxsCN_T06',␣
 ↪'TxsCN_T07', 'TxsCN_T08', 'TxsCN_T09', 'TxsCN_T10', 'TxsCN_T11', 'TxsCN_T12',
'TxsCI_T01', 'TxsCI_T02', 'TxsCI_T03', 'TxsCI_T04', 'TxsCI_T05', 'TxsCI_T06',␣
 ↪'TxsCI_T07', 'TxsCI_T08', 'TxsCI_T09', 'TxsCI_T10', 'TxsCI_T11', 'TxsCI_T12',
'UsoL1_T01','UsoL1_T02', 'UsoL1_T03', 'UsoL1_T04', 'UsoL1_T05', 'UsoL1_T06',␣
 ↪'UsoL1_T07', 'UsoL1_T08', 'UsoL1_T09', 'UsoL1_T10', 'UsoL1_T11', 'UsoL1_T12',
'UsoLI_T01', 'UsoLI_T02', 'UsoLI_T03', 'UsoLI_T04', 'UsoLI_T05', 'UsoLI_T06',␣
 ↪'UsoLI_T07', 'UsoLI_T08', 'UsoLI_T09', 'UsoLI_T10', 'UsoLI_T11', 'UsoLI_T12',
'PagoNac_T01', 'PagoNac_T02', 'PagoNac_T03', 'PagoNac_T04', 'PagoNac_T05',␣
 ↪'PagoNac_T06',
'PagoNac_T07', 'PagoNac_T08', 'PagoNac_T09', 'PagoNac_T10', 'PagoNac_T11',␣
 ↪'PagoNac_T12',
'PagoInt_T01', 'PagoInt_T02', 'PagoInt_T03', 'PagoInt_T04', 'PagoInt_T05',␣
 ↪'PagoInt_T06',
'PagoInt_T07', 'PagoInt_T08', 'PagoInt_T09', 'PagoInt_T10', 'PagoInt_T11',␣
 ↪'PagoInt_T12',
'FlgAct_T01', 'FlgAct_T02', 'FlgAct_T03', 'FlgAct_T04', 'FlgAct_T05',␣
 ↪'FlgAct_T06', 'FlgAct_T07',
'FlgAct_T08', 'FlgAct_T09', 'FlgAct_T10', 'FlgAct_T11', 'FlgAct_T12',␣
 ↪'FacAN_T01', 'FacAN_T02',
'FacAN_T03', 'FacAN_T04', 'FacAN_T05', 'FacAN_T06', 'FacAN_T07', 'FacAN_T08',␣
 ↪'FacAN_T09',
'FacAN_T10', 'FacAN_T11', 'FacAN_T12', 'FacAI_T01', 'FacAI_T02', 'FacAI_T03',␣
 ↪'FacAI_T04',
'FacAI_T05', 'FacAI_T06', 'FacAI_T07', 'FacAI_T08', 'FacAI_T09', 'FacAI_T10',␣
 ↪'FacAI_T11',
'FacAI_T12', 'IndRev_T12','IndRev_T11','IndRev_T10','IndRev_T09','IndRev_T08',
```

```
'IndRev_T07','IndRev_T06','IndRev_T05','IndRev_T04','IndRev_T03','IndRev_T02','IndRev_T01']],
 ↪axis=1)

df_acotado_x_region.head(20)
```

[83]:

0	Id	Edad	Renta	Region	Sexo	TC	Cuentas	Antiguedad	CUPO_L1	\
0	1	43	NaN	13	M	3	1	130	798000.0	
1	2	46	143640.0	13	H	1	1	69	750000.0	
2	3	45	929106.0	13	H	2	1	24	1350000.0	
3	4	46	172447.0	13	H	2	1	134	1570800.0	
4	5	46	805250.0	13	H	3	2	116	2762000.0	
5	6	47	707664.0	13	H	2	1	67	1312500.0	
6	7	48	1022833.0	13	H	2	2	21	813000.0	
7	8	46	NaN	13	H	3	2	69	1242000.0	
8	9	49	1171066.0	13	H	1	1	33	1996400.0	
9	10	44	964387.0	13	M	3	1	23	672000.0	
10	11	38	NaN	13	M	1	1	38	5000000.0	
12	13	36	1263238.0	13	H	1	1	80	500000.0	
14	15	48	592541.0	13	H	1	1	13	400000.0	
15	16	46	NaN	13	H	2	2	7	800000.0	
16	17	51	752396.0	13	M	2	2	22	600000.0	
17	18	37	844830.0	13	H	1	1	72	2812500.0	
18	19	47	176712.0	13	M	1	1	94	3891336.0	
20	21	50	691615.0	13	M	2	1	18	300000.0	
22	23	48	991751.0	13	H	1	1	18	1250000.0	
23	24	46	440339.0	13	H	1	1	184	1440000.0	

0	CUPO_MX	target
0	1210.0	0
1	1000.0	0
2	1500.0	0
3	0.0	0
4	6430.0	0
5	714.0	0
6	600.0	0
7	1255.0	0
8	2000.0	1
9	1000.0	0
10	8300.0	0
12	1500.0	0
14	1000.0	0
15	1200.0	0
16	400.0	0
17	4500.0	0
18	4395.0	0
20	500.0	0
22	2000.0	0

```
23      0.0       0
```

5.0.4 Revisamos la cantidad de 0s en la columna Region.

[84]:
```
# Contar los ceros en la columna Region
cantidad_ceros_region = (df_acotado_x_region['Region'] == 0).sum()

if cantidad_ceros_region > 0:
    print(f"Hay {cantidad_ceros_region} valores 0 en la columna Region.")
else:
    print("No hay valores 0 en la columna Region.")
```

```
No hay valores 0 en la columna Region.
```

5.0.5 Hacemos una pequeña estadística de los datos por cada columna, para tener mejor idea de los datos con los que estamos trabajando.

[85]:
```
for i in df_acotado_x_region:
  print(f"{i} = {df_acotado_x_region[i].describe()} \n")
```

```
Id = count    32935.000000
mean     25422.027478
std      14808.382727
min          1.000000
25%      12640.500000
50%      25031.000000
75%      38561.500000
max      51124.000000
Name: Id, dtype: float64

Edad = count    32935.000000
mean        38.897161
std         13.204920
min         19.000000
25%         29.000000
50%         35.000000
75%         46.000000
max         97.000000
Name: Edad, dtype: float64

Renta = count    2.516300e+04
mean     6.667516e+05
std      4.001187e+05
min      1.000000e+00
25%      4.209665e+05
50%      5.711190e+05
75%      8.188455e+05
```

```
max      8.870997e+06
Name: Renta, dtype: float64

Region = count    32935.0
mean         13.0
std           0.0
min          13.0
25%          13.0
50%          13.0
75%          13.0
max          13.0
Name: Region, dtype: float64

Sexo = count     32935
unique           2
top              H
freq         17490
Name: Sexo, dtype: object

TC = count    32935.000000
mean          1.774677
std           0.902230
min           1.000000
25%           1.000000
50%           2.000000
75%           2.000000
max          12.000000
Name: TC, dtype: float64

Cuentas = count    32935.000000
mean          1.403613
std           0.547711
min           1.000000
25%           1.000000
50%           1.000000
75%           2.000000
max           5.000000
Name: Cuentas, dtype: float64

Antiguedad = count    32935.000000
mean         40.378503
std          36.683227
min           6.000000
25%          14.000000
50%          26.000000
75%          57.000000
max         324.000000
Name: Antiguedad, dtype: float64
```

```
CUPO_L1 = count    3.293500e+04
mean     1.164242e+06
std      1.074405e+06
min      0.000000e+00
25%      4.290000e+05
50%      8.470000e+05
75%      1.569250e+06
max      1.740000e+07
Name: CUPO_L1, dtype: float64

CUPO_MX = count    32935.000000
mean      1450.414483
std       1617.887384
min          0.000000
25%        400.000000
50%       1000.000000
75%       2000.000000
max      40000.000000
Name: CUPO_MX, dtype: float64

target = count    32935.000000
mean         0.086048
std          0.280440
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max          1.000000
Name: target, dtype: float64
```

5.0.6 Revisamos los valor únicos que tiene cada columna.

[86]:
```
for i in df_acotado_x_region:
    print(f"{i} = {df_acotado_x_region[i].unique()} \n")
```

```
Id = [    1     2     3 … 51122 51123 51124]

Edad = [43 46 45 47 48 49 44 38 36 51 37 50 41 39 42 40 32 34 35 33 31 52 53 30
 87 55 29 54 59 69 56 62 60 27 63 28 26 64 25 61 83 86 80 93 79 82 84 97
 88 91 68 89 90 75 57 77 95 67 65 24 22 58 23 71 21 20 19 70 85 73 81 78
 76 72 74 66 94]

Renta = [    nan 143640. 929106. … 625376. 806220. 840878.]

Region = [13]
```

```
Sexo = ['M' 'H']

TC = [ 3  1  2  4  5  6  8  7 12 10  9 11]

Cuentas = [1 2 3 4 5]

Antiguedad = [130  69  24 134 116  67  21  33  23  38  80  13   7  22  72  94
18 184
  49  14 109 105  27  78  60 152  10  28  19  26  75  70  48  74  15  30
  61  36   8  87  35 145  16  47  20  39   9  25  84  73  92  50  65  99
  96  83  64  59  32 180   6 117  68  93  82 107  79  31  63  53  56  11
  81  58  57  45 188 108  44  37  52  97 119 148  54  41 149  66  71 155
 113  34  29 143  43 110 106 120  85  98  12  51  40  42 140 150 131 101
 127  17  77 122  95  88 100 142 151  86 112  55 121 154 118 137 126  90
  62 133  46 141 136 123 138  89 125 104 147 153 102 144 111 162  91 115
 114  76 128 135 157 124 132 168 171 156 165 146 159 103 139 247 163 129
 229 158 161 250 178 160 175 311 217 173 249 238 169 221 225 231 187 164
 218 179 172 166 313 174 205 233 324 263 210 215 256 183 248 242 227 254
 253 246 226 167 264 312 196 182 251 176 211 212 194 239 277 181 170 213
 191 189 230 190]

CUPO_L1 = [ 798000.  750000. 1350000. … 2278125. 2524600. 2735424.]

CUPO_MX = [ 1210.  1000.  1500. … 12975.  8775.  1526.]

target = [0 1]
```

5.1 Identificación de Valores Faltantes

5.1.1 En este paso, identificamos las columnas que contienen valores faltantes dentro del dataset. Esto es importante ya que los algoritmos de Machine Learning generalmente no funcionan bien con datos incompletos. Visualizamos estos valores faltantes usando un mapa de calor para identificar qué columnas requieren atención.

[87]:
```python
# Revisamos cuántos valores faltantes hay por columna
# Iterar por cada columna del DataFrame
for columna in df_acotado_x_region.columns:
    total_faltantes = df_acotado_x_region[columna].isna().sum()
    porcentaje_faltantes = (df_acotado_x_region[columna].isna().mean() * 100)
    tipo_dato = df_acotado_x_region[columna].dtype

    # Mostrar la información de la columna actual
    print(f"Columna: {columna}")
    print(f"  - Total Faltantes: {total_faltantes}")
    print(f"  - Porcentaje Faltantes: {porcentaje_faltantes:.2f}%")
    print(f"  - Tipo de Dato: {tipo_dato}")
```

```
    print("-" * 40)
```

```
Columna: Id
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
Columna: Edad
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
Columna: Renta
  - Total Faltantes: 7772
  - Porcentaje Faltantes: 23.60%
  - Tipo de Dato: float64
----------------------------------------
Columna: Region
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
Columna: Sexo
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: object
----------------------------------------
Columna: TC
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
Columna: Cuentas
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
Columna: Antiguedad
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
Columna: CUPO_L1
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: float64
----------------------------------------
```

```
Columna: CUPO_MX
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: float64
----------------------------------------
Columna: target
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
```

5.1.2 Eliminamos la columna Región.

[88]:
```
df_acotado_x_region = df_acotado_x_region.drop('Region', axis=1)
df_acotado_x_region = df_acotado_x_region.drop('Id', axis=1)
# df_acotado_x_region.to_csv('/Users/herna/Desktop/df_acotado_new.csv')
```

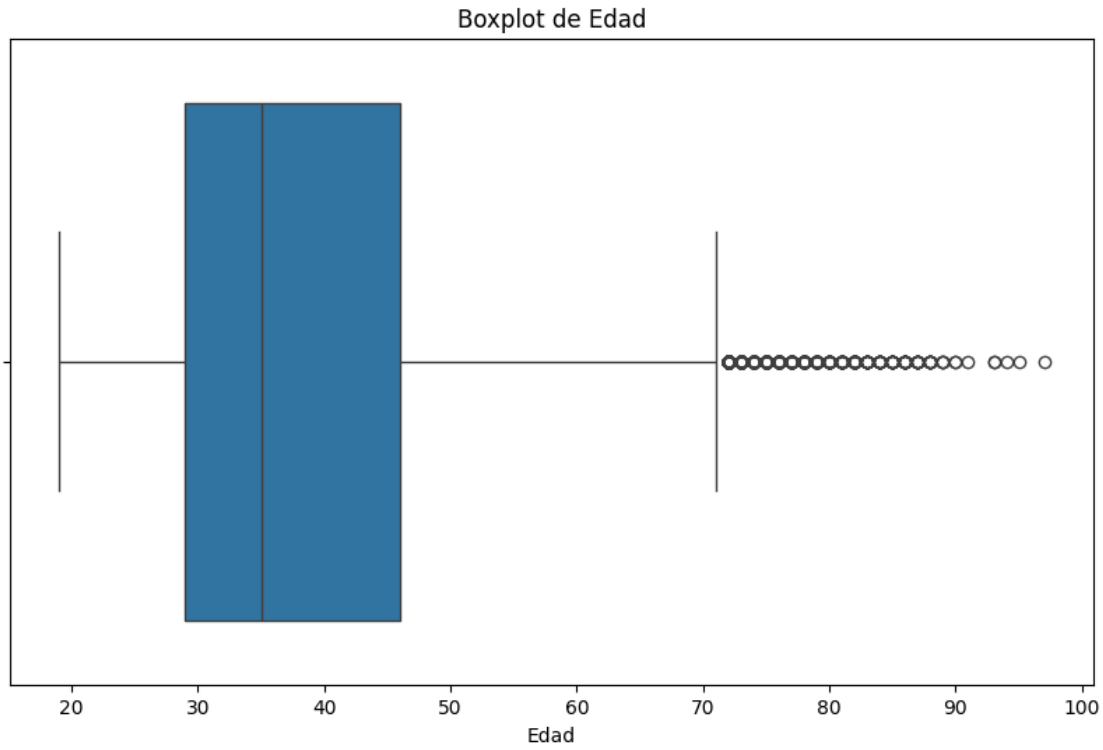
5.2 Detección y Manejo de Outliers

5.2.1 Los outliers pueden influir negativamente en los resultados del análisis y el modelado. Aquí, utilizamos el método del rango intercuartil (IQR) para identificar y eliminar los outliers en las variables numéricas, asegurando que no distorsionen las relaciones entre las variables.

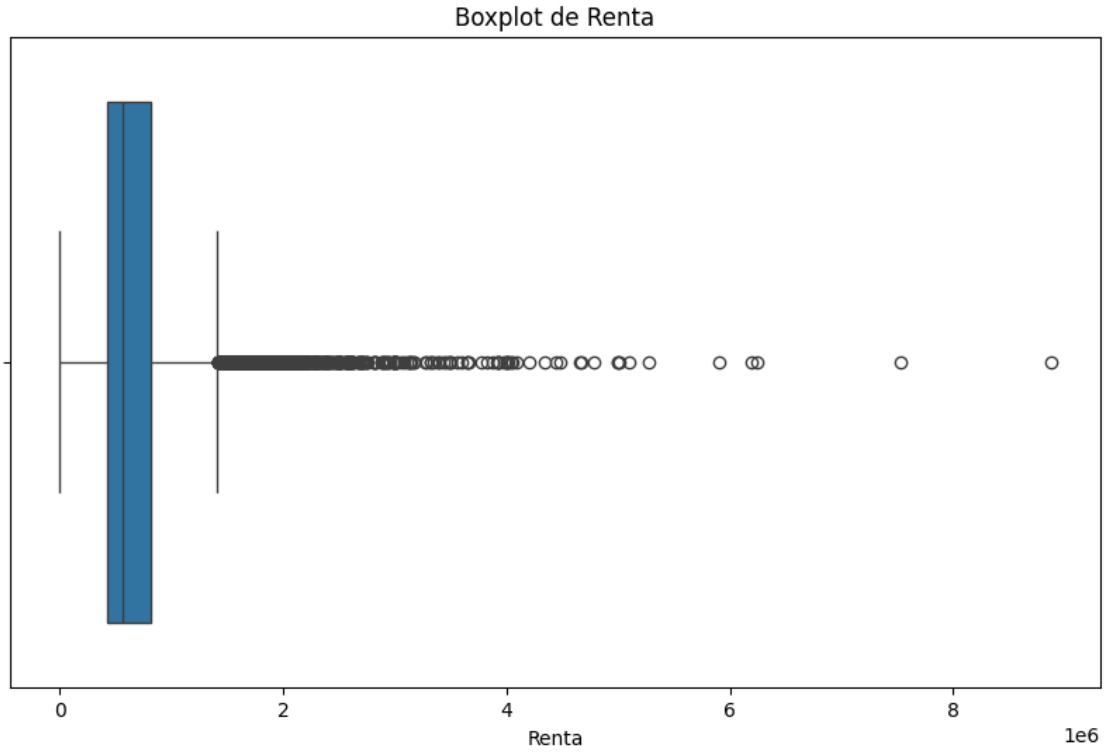
[89]:
```
# Suponiendo que df_acotado_x_region es el dataframe original
df_acotado_x_region_v2 = df_acotado_x_region.copy()

# Listado de columnas numéricas relevantes para detectar outliers
num_columnas = ['Edad', 'Renta', 'Antiguedad', 'CUPO_L1', 'CUPO_MX']

# Función para detectar outliers con el método IQR en cualquier columna numérica
def detectar_outliers(df, columna):
    Q1 = df[columna].quantile(0.25)
    Q3 = df[columna].quantile(0.75)
    IQR = Q3 - Q1
    # Definir los límites para identificar los outliers
    outliers = df[(df[columna] < (Q1 - 1.5 * IQR)) | (df[columna] > (Q3 + 1.5 *␣
 ↪IQR))]
    return outliers

# Visualización de outliers con gráficos de caja para una columna
def visualizar_outliers(df, columna):
    plt.figure(figsize=(10, 6))
    sb.boxplot(x=df[columna])
    plt.title(f'Boxplot de {columna}')
    plt.show()
```

```
# Detección, visualización y eliminación de outliers para todas las columnas␣
 ↪numéricas
all_outliers = pd.DataFrame()  # Para acumular todos los outliers detectados

for columnas in num_columnas:
    # Detectar outliers en la columna actual
    outliers_col = detectar_outliers(df_acotado_x_region_v2, columnas)
    print(f"Outliers detectados en '{columnas}': {outliers_col.shape[0]}")

    # Visualizar los outliers en la columna actual
    visualizar_outliers(df_acotado_x_region_v2, columnas)

    # Acumular los outliers detectados
    all_outliers = pd.concat([all_outliers, outliers_col])

# Eliminar los outliers detectados de todas las columnas
df_acotado_x_region_v2 = df_acotado_x_region_v2[~df_acotado_x_region_v2.index.
 ↪isin(all_outliers.index)]

# Mostrar el número de filas después de eliminar los outliers
print(f"Filas después de eliminar outliers: {df_acotado_x_region_v2.shape[0]}")

# Ver los primeros 25 registros después de eliminar outliers
df_acotado_x_region_v2.head(25)
```

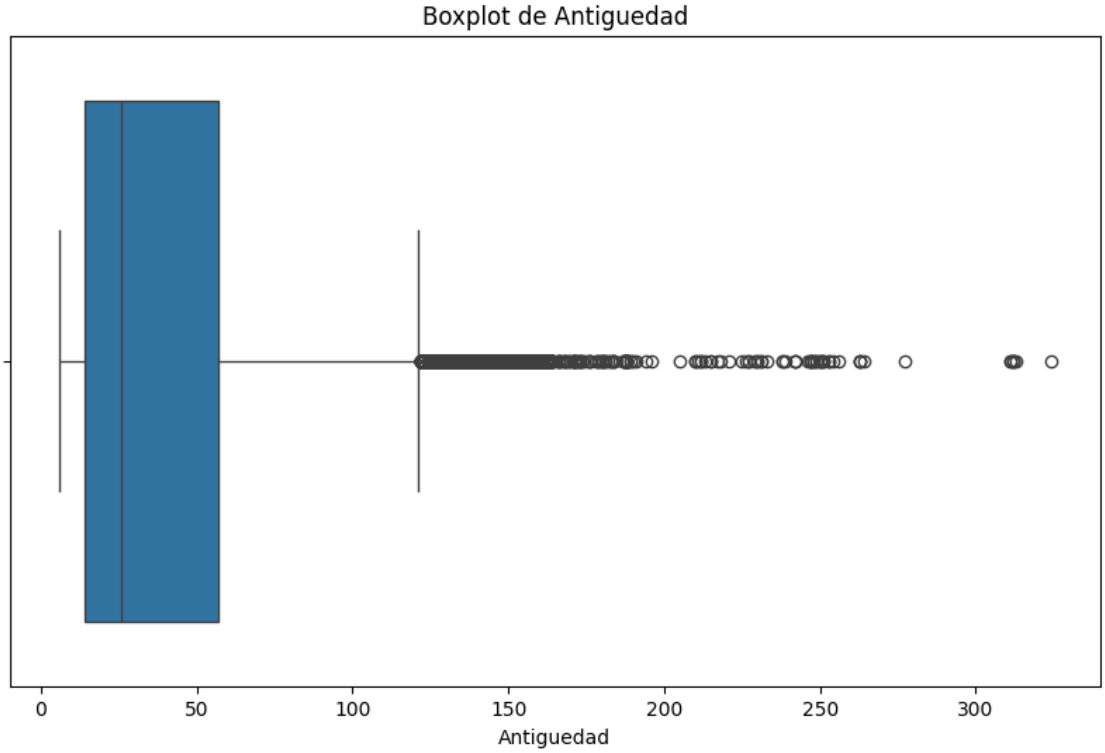
```
Outliers detectados en 'Edad': 737
```



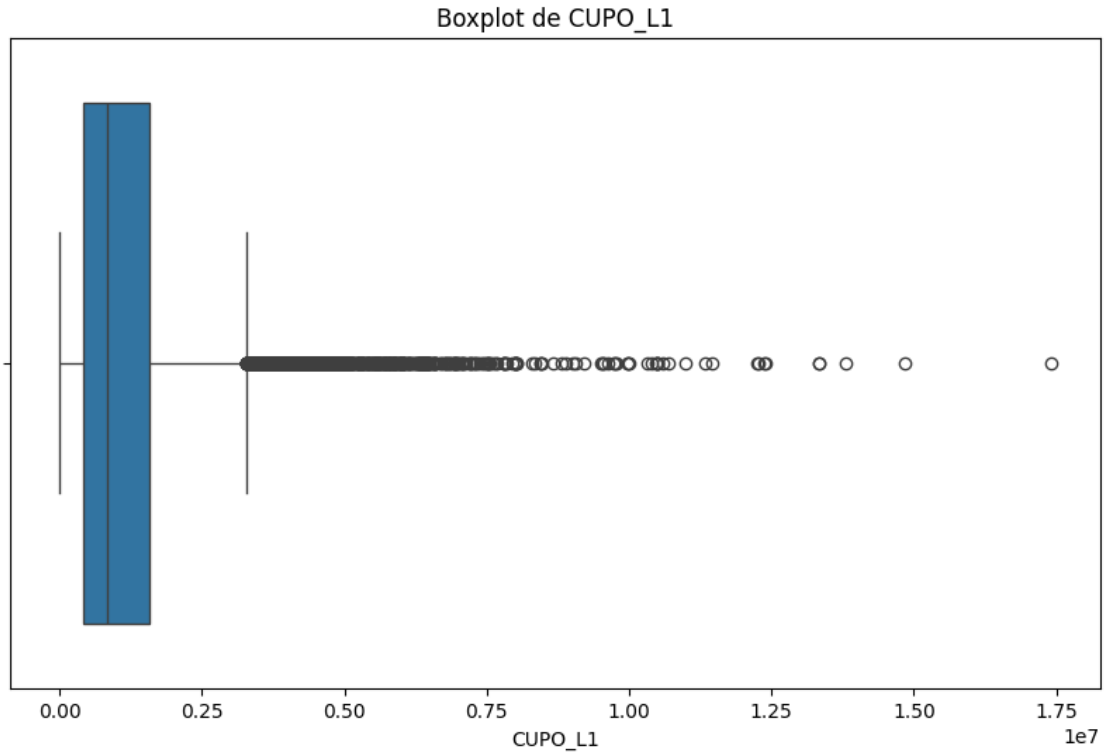

```
Outliers detectados en 'Renta': 999
```



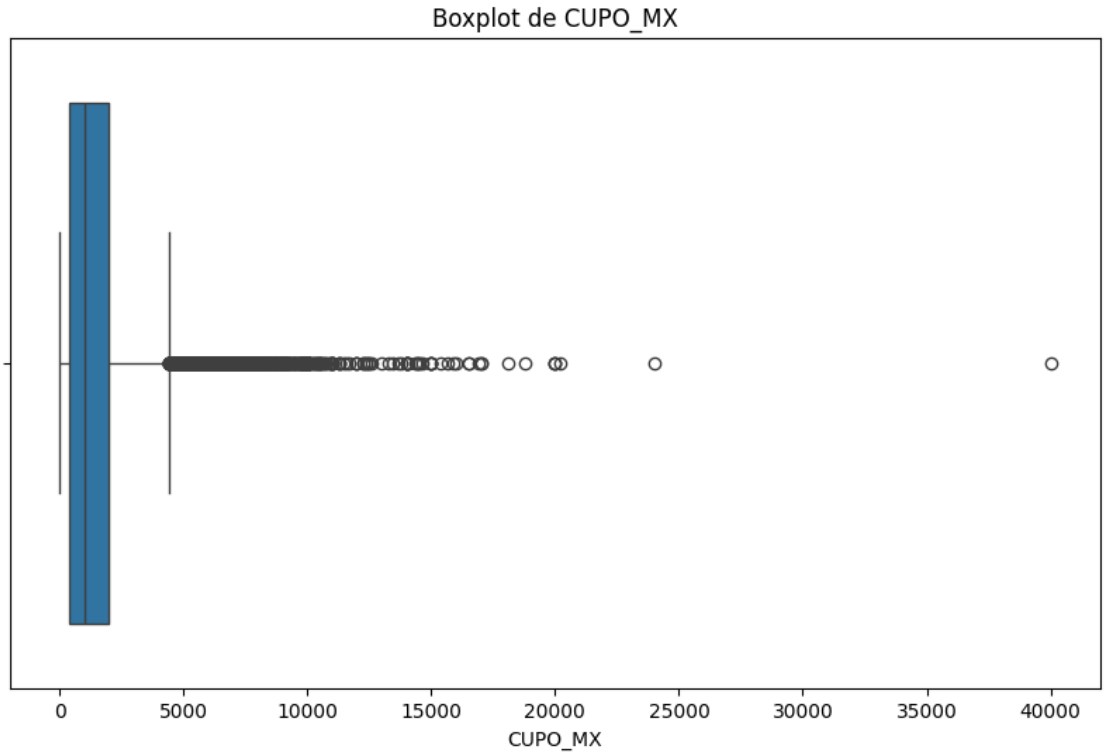
```
Outliers detectados en 'Antiguedad': 1528
```




```
Outliers detectados en 'CUPO_L1': 1547
```




```
Outliers detectados en 'CUPO_MX': 1803
```



```
Filas después de eliminar outliers: 28362
```

[89]:

0	Edad	Renta	Sexo	TC	Cuentas	Antiguedad	CUPO_L1	CUPO_MX	target
1	46	143640.0	H	1	1	69	750000.0	1000.0	0
2	45	929106.0	H	2	1	24	1350000.0	1500.0	0
5	47	707664.0	H	2	1	67	1312500.0	714.0	0
6	48	1022833.0	H	2	2	21	813000.0	600.0	0
7	46	NaN	H	3	2	69	1242000.0	1255.0	0
8	49	1171066.0	H	1	1	33	1996400.0	2000.0	1
9	44	964387.0	M	3	1	23	672000.0	1000.0	0
12	36	1263238.0	H	1	1	80	500000.0	1500.0	0
14	48	592541.0	H	1	1	13	400000.0	1000.0	0
15	46	NaN	H	2	2	7	800000.0	1200.0	0
16	51	752396.0	M	2	2	22	600000.0	400.0	0
20	50	691615.0	M	2	1	18	300000.0	500.0	0
22	48	991751.0	H	1	1	18	1250000.0	2000.0	0
25	43	843556.0	H	4	2	49	1680000.0	1000.0	1
27	43	1309234.0	H	1	1	14	600000.0	1000.0	0
28	45	1400000.0	M	1	1	13	500000.0	800.0	0
29	51	NaN	M	1	1	109	1228000.0	12.0	0
31	47	NaN	H	1	1	72	2872800.0	2850.0	0
35	51	NaN	M	2	2	105	2301000.0	0.0	0
36	48	528152.0	H	2	2	27	2160000.0	2000.0	0
37	48	NaN	M	1	1	78	650000.0	1500.0	0
40	49	860000.0	M	3	1	60	1920000.0	1270.0	0
41	44	1014542.0	H	1	1	38	750000.0	500.0	0
43	50	661022.0	M	2	2	10	1000000.0	1000.0	0
47	39	1169226.0	M	1	1	28	500000.0	500.0	1

5.2.2 Imputamos con el modelo Regresión Lineal, porque es más confiable que la imputación con la media o mediana, y se basa en las relaciones entre múltiples variables del dataset, haciendo que las imputaciones sean más precisas.

[90]:
```python
# Separar los datos con y sin valores faltantes en la columna 'Renta'
con_renta = df_acotado_x_region_v2[df_acotado_x_region_v2['Renta'].notnull()]
sin_renta = df_acotado_x_region_v2[df_acotado_x_region_v2['Renta'].isnull()]

# Definir las columnas predictoras (excluimos 'Renta', 'Unnamed: 0', 'target')
predictores = ['Edad', 'Sexo', 'Cuentas', 'Antiguedad']

# Separar las variables predictoras y la variable objetivo ('Renta')
X = con_renta[predictores]
y = con_renta['Renta']

# Preprocesamiento: OneHotEncoding para la columna 'Sexo' (es categórica)
```

```
preprocesador = ColumnTransformer(transformers=[
    ('cat', OneHotEncoder(drop='first'), ['Sexo'])
], remainder='passthrough')

# Crear un pipeline que combine preprocesamiento y modelo
pipeline = Pipeline(steps=[
    ('preprocessor', preprocesador),
    ('model', LinearRegression())
])

# Entrenar el modelo de regresión
pipeline.fit(X, y)

# Ahora usamos este modelo para predecir los valores faltantes de 'Renta'
X_faltantes = sin_renta[predictores]

# Predecir los valores de Renta faltantes
renta_pred = pipeline.predict(X_faltantes)

# Imputar los valores predichos en el dataframe original
df_acotado_x_region_v2.loc[df_acotado_x_region_v2['Renta'].isnull(), 'Renta'] =␣
 ↪renta_pred

# Mostrar el dataframe con la columna 'Renta' imputada
df_acotado_x_region_v2.head(50)
```

[90]:

0	Edad	Renta	Sexo	TC	Cuentas	Antiguedad	CUPO_L1	CUPO_MX	\
1	46	1.436400e+05	H	1	1	69	750000.0	1000.0	
2	45	9.291060e+05	H	2	1	24	1350000.0	1500.0	
5	47	7.076640e+05	H	2	1	67	1312500.0	714.0	
6	48	1.022833e+06	H	2	2	21	813000.0	600.0	
7	46	6.896734e+05	H	3	2	69	1242000.0	1255.0	
8	49	1.171066e+06	H	1	1	33	1996400.0	2000.0	
9	44	9.643870e+05	M	3	1	23	672000.0	1000.0	
12	36	1.263238e+06	H	1	1	80	500000.0	1500.0	
14	48	5.925410e+05	H	1	1	13	400000.0	1000.0	
15	46	6.449081e+05	H	2	2	7	800000.0	1200.0	
16	51	7.523960e+05	M	2	2	22	600000.0	400.0	
20	50	6.916150e+05	M	2	1	18	300000.0	500.0	
22	48	9.917510e+05	H	1	1	18	1250000.0	2000.0	
25	43	8.435560e+05	H	4	2	49	1680000.0	1000.0	
27	43	1.309234e+06	H	1	1	14	600000.0	1000.0	
28	45	1.400000e+06	M	1	1	13	500000.0	800.0	
29	51	6.657003e+05	M	1	1	109	1228000.0	12.0	
31	47	6.820956e+05	H	1	1	72	2872800.0	2850.0	
35	51	6.756576e+05	M	2	2	105	2301000.0	0.0	
36	48	5.281520e+05	H	2	2	27	2160000.0	2000.0	

37	48	6.340130e+05	M	1	1	78	650000.0	1500.0
40	49	8.600000e+05	M	3	1	60	1920000.0	1270.0
41	44	1.014542e+06	H	1	1	38	750000.0	500.0
43	50	6.610220e+05	M	2	2	10	1000000.0	1000.0
47	39	1.169226e+06	M	1	1	28	500000.0	500.0
48	44	7.048370e+05	M	2	2	24	2160000.0	2000.0
50	47	7.145790e+05	H	1	1	38	1218000.0	1000.0
51	47	8.161170e+05	H	2	1	26	832000.0	400.0
52	47	9.580470e+05	H	3	2	75	2520000.0	500.0
55	45	6.261525e+05	M	1	1	80	600000.0	500.0
56	37	5.941200e+05	M	2	1	70	1300000.0	2600.0
58	39	6.012840e+05	M	1	1	7	500000.0	500.0
60	50	5.334030e+05	M	4	2	14	600000.0	1000.0
62	47	3.828300e+05	H	3	2	13	400000.0	200.0
63	37	1.003000e+06	M	2	2	48	2579700.0	2350.0
64	47	6.280234e+05	M	1	1	74	1170000.0	1500.0
65	42	1.380653e+06	H	4	2	15	1995000.0	3000.0
67	50	7.388910e+05	M	1	1	30	500000.0	350.0
72	49	1.410000e+05	M	1	1	22	650000.0	450.0
76	45	5.239720e+05	H	1	1	36	1913625.0	750.0
77	50	4.423570e+05	H	2	2	8	1400000.0	1200.0
78	40	2.500000e+05	H	2	2	87	1600000.0	2000.0
79	46	5.093260e+05	M	1	1	35	300000.0	0.0
80	38	5.000000e+05	H	1	1	14	725000.0	800.0
82	42	1.118632e+06	H	2	2	16	2000000.0	3200.0
83	32	3.140170e+05	H	1	1	47	300000.0	1000.0
84	34	5.489570e+05	M	2	2	26	1360000.0	2100.0
86	47	4.281360e+05	H	2	2	24	3000000.0	4000.0
87	44	4.039770e+05	M	1	1	33	710000.0	800.0
88	36	7.019710e+05	M	3	2	20	800000.0	1400.0

0	target
1	0
2	0
5	0
6	0
7	0
8	1
9	0
12	0
14	0
15	0
16	0
20	0
22	0
25	1
27	0

```
28      0
29      0
31      0
35      0
36      0
37      0
40      0
41      0
43      0
47      1
48      0
50      0
51      0
52      0
55      1
56      0
58      0
60      1
62      0
63      0
64      0
65      0
67      0
72      0
76      0
77      0
78      0
79      0
80      0
82      0
83      0
84      0
86      0
87      0
88      0
```

5.2.3 Vamos a borrar y verificar los nulos en las columnas del Array.

[91]:
```
columnas_a_checkear = ['Edad', 'Renta', 'Sexo', 'TC', 'Cuentas', 'Antiguedad',␣
 ↪'CUPO_L1', 'CUPO_MX', 'target']

# Mostrar la cantidad de filas antes de la limpieza
filas_iniciales = df_acotado_x_region_v2.shape[0]

# Eliminar las filas que contengan valores nulos en las columnas seleccionadas
df_acotado_x_region_v2 = df_acotado_x_region_v2.
 ↪dropna(subset=columnas_a_checkear)
```

```
# Mostrar la cantidad de filas después de la limpieza
filas_limpias = df_acotado_x_region_v2.shape[0]

print(f"Filas iniciales: {filas_iniciales}")
print(f"Filas después de eliminar valores nulos en las columnas seleccionadas:␣
 ↪{filas_limpias}")

porcentaje_reduccion = ((filas_iniciales / filas_limpias) * 100) - 100
porcentaje_reduccion_redondeado = round(porcentaje_reduccion, 1)

print(f"Porcentaje de reducción de datos: {porcentaje_reduccion_redondeado}%")

df_acotado_x_region_v2.head(50)
```

```
Filas iniciales: 28362
Filas después de eliminar valores nulos en las columnas seleccionadas: 28362
Porcentaje de reducción de datos: 0.0%
```

[91]:

0	Edad	Renta	Sexo	TC	Cuentas	Antiguedad	CUPO_L1	CUPO_MX	\
1	46	1.436400e+05	H	1	1	69	750000.0	1000.0	
2	45	9.291060e+05	H	2	1	24	1350000.0	1500.0	
5	47	7.076640e+05	H	2	1	67	1312500.0	714.0	
6	48	1.022833e+06	H	2	2	21	813000.0	600.0	
7	46	6.896734e+05	H	3	2	69	1242000.0	1255.0	
8	49	1.171066e+06	H	1	1	33	1996400.0	2000.0	
9	44	9.643870e+05	M	3	1	23	672000.0	1000.0	
12	36	1.263238e+06	H	1	1	80	500000.0	1500.0	
14	48	5.925410e+05	H	1	1	13	400000.0	1000.0	
15	46	6.449081e+05	H	2	2	7	800000.0	1200.0	
16	51	7.523960e+05	M	2	2	22	600000.0	400.0	
20	50	6.916150e+05	M	2	1	18	300000.0	500.0	
22	48	9.917510e+05	H	1	1	18	1250000.0	2000.0	
25	43	8.435560e+05	H	4	2	49	1680000.0	1000.0	
27	43	1.309234e+06	H	1	1	14	600000.0	1000.0	
28	45	1.400000e+06	M	1	1	13	500000.0	800.0	
29	51	6.657003e+05	M	1	1	109	1228000.0	12.0	
31	47	6.820956e+05	H	1	1	72	2872800.0	2850.0	
35	51	6.756576e+05	M	2	2	105	2301000.0	0.0	
36	48	5.281520e+05	H	2	2	27	2160000.0	2000.0	
37	48	6.340130e+05	M	1	1	78	650000.0	1500.0	
40	49	8.600000e+05	M	3	1	60	1920000.0	1270.0	
41	44	1.014542e+06	H	1	1	38	750000.0	500.0	
43	50	6.610220e+05	M	2	2	10	1000000.0	1000.0	
47	39	1.169226e+06	M	1	1	28	500000.0	500.0	
48	44	7.048370e+05	M	2	2	24	2160000.0	2000.0	
50	47	7.145790e+05	H	1	1	38	1218000.0	1000.0	

51	47	8.161170e+05	H	2	1	26	832000.0	400.0
52	47	9.580470e+05	H	3	2	75	2520000.0	500.0
55	45	6.261525e+05	M	1	1	80	600000.0	500.0
56	37	5.941200e+05	M	2	1	70	1300000.0	2600.0
58	39	6.012840e+05	M	1	1	7	500000.0	500.0
60	50	5.334030e+05	M	4	2	14	600000.0	1000.0
62	47	3.828300e+05	H	3	2	13	400000.0	200.0
63	37	1.003000e+06	M	2	2	48	2579700.0	2350.0
64	47	6.280234e+05	M	1	1	74	1170000.0	1500.0
65	42	1.380653e+06	H	4	2	15	1995000.0	3000.0
67	50	7.388910e+05	M	1	1	30	500000.0	350.0
72	49	1.410000e+05	M	1	1	22	650000.0	450.0
76	45	5.239720e+05	H	1	1	36	1913625.0	750.0
77	50	4.423570e+05	H	2	2	8	1400000.0	1200.0
78	40	2.500000e+05	H	2	2	87	1600000.0	2000.0
79	46	5.093260e+05	M	1	1	35	300000.0	0.0
80	38	5.000000e+05	H	1	1	14	725000.0	800.0
82	42	1.118632e+06	H	2	2	16	2000000.0	3200.0
83	32	3.140170e+05	H	1	1	47	300000.0	1000.0
84	34	5.489570e+05	M	2	2	26	1360000.0	2100.0
86	47	4.281360e+05	H	2	2	24	3000000.0	4000.0
87	44	4.039770e+05	M	1	1	33	710000.0	800.0
88	36	7.019710e+05	M	3	2	20	800000.0	1400.0

0	target
1	0
2	0
5	0
6	0
7	0
8	1
9	0
12	0
14	0
15	0
16	0
20	0
22	0
25	1
27	0
28	0
29	0
31	0
35	0
36	0
37	0
40	0

```
41      0
43      0
47      1
48      0
50      0
51      0
52      0
55      1
56      0
58      0
60      1
62      0
63      0
64      0
65      0
67      0
72      0
76      0
77      0
78      0
79      0
80      0
82      0
83      0
84      0
86      0
87      0
88      0
```

5.3 Codificación de Variables Categóricas

5.3.1 Para poder utilizar las variables categóricas en modelos de Machine Learning, es necesario transformarlas en representaciones numéricas. Para esto, utilizamos Label Encoding para variables categóricas con pocos valores (como 'Sexo')

[92]:
```
# Ver los valores únicos de la columna 'Region'
print(df_acotado_x_region_v2['Sexo'].unique())

# Ver la cantidad de valores únicos
print(f"Cantidad de valores únicos: {df_acotado_x_region_v2['Sexo'].nunique()}")

# Revisar si hay valores nulos en la columna 'Region'
print(f"Cantidad de valores nulos: {df_acotado_x_region_v2['Sexo'].isnull().
 ↪sum()}")

# Hacer un conteo de la cantidad de veces que aparece cada valor único en la␣
 ↪columna 'Region'
```

```
print(df_acotado_x_region_v2['Sexo'].value_counts())
```

```
['H' 'M']
Cantidad de valores únicos: 2
Cantidad de valores nulos: 0
Sexo
H    14685
M    13677
Name: count, dtype: int64
```

[93]:
```
# Usamos Label Encoding para 'Sexo', ya que solo tiene unos pocos valores
label_encoder = LabelEncoder()
df_acotado_x_region_v2['Sexo'] = label_encoder.
 ↪fit_transform(df_acotado_x_region_v2['Sexo'])
df_preparado = df_acotado_x_region_v2

df_preparado.head(20)
```

[93]:

0	Edad	Renta	Sexo	TC	Cuentas	Antiguedad	CUPO_L1	CUPO_MX	\
1	46	1.436400e+05	0	1	1	69	750000.0	1000.0	
2	45	9.291060e+05	0	2	1	24	1350000.0	1500.0	
5	47	7.076640e+05	0	2	1	67	1312500.0	714.0	
6	48	1.022833e+06	0	2	2	21	813000.0	600.0	
7	46	6.896734e+05	0	3	2	69	1242000.0	1255.0	
8	49	1.171066e+06	0	1	1	33	1996400.0	2000.0	
9	44	9.643870e+05	1	3	1	23	672000.0	1000.0	
12	36	1.263238e+06	0	1	1	80	500000.0	1500.0	
14	48	5.925410e+05	0	1	1	13	400000.0	1000.0	
15	46	6.449081e+05	0	2	2	7	800000.0	1200.0	
16	51	7.523960e+05	1	2	2	22	600000.0	400.0	
20	50	6.916150e+05	1	2	1	18	300000.0	500.0	
22	48	9.917510e+05	0	1	1	18	1250000.0	2000.0	
25	43	8.435560e+05	0	4	2	49	1680000.0	1000.0	
27	43	1.309234e+06	0	1	1	14	600000.0	1000.0	
28	45	1.400000e+06	1	1	1	13	500000.0	800.0	
29	51	6.657003e+05	1	1	1	109	1228000.0	12.0	
31	47	6.820956e+05	0	1	1	72	2872800.0	2850.0	
35	51	6.756576e+05	1	2	2	105	2301000.0	0.0	
36	48	5.281520e+05	0	2	2	27	2160000.0	2000.0	

0	target
1	0
2	0
5	0
6	0
7	0
8	1

```
9        0
12       0
14       0
15       0
16       0
20       0
22       0
25       1
27       0
28       0
29       0
31       0
35       0
36       0
```

5.3.2 Ahora salió una incógnita, ya que utilizamos el label encoding para las columnas, necesitamos primeramente identificar qué valores entre 0 y 1 serán los sexos "Masculino" y "Femenino"

[94]:
```
columnas_interes = ['Sexo']

conteo_ceros = df_preparado[columnas_interes].apply(lambda x: (x == True).sum())
conteo_unos = df_preparado[columnas_interes].apply(lambda x: (x == False).sum())
conteo_dos = df_preparado[columnas_interes].apply(lambda x: (x.isna()).sum())

resultados_conteo = pd.DataFrame({
    '0': conteo_ceros, # Femenino
    '1': conteo_unos, # Masculino
    '2': conteo_dos # EN el caso de haber quedado valores nulos.

})

print(resultados_conteo)
print("El valor con mayor cantidad serán los hombres ya que logramos apreciar␣
 ↪anteriormente que hay más clientes de sexo masculino")
resultados_conteo.head(50)
```

```
          0      1  2
0
Sexo  13677  14685  0
El valor con mayor cantidad serán los hombres ya que logramos apreciar
anteriormente que hay más clientes de sexo masculino
```

[94]:
```
          0      1  2
0
Sexo  13677  14685  0
```

[95]:
```
df_preparado.apply(lambda col: print(f"\nDescripción de la columna '{col.name}':
  ↪\n", col.describe()))
```

```
Descripción de la columna 'Edad':
 count    28362.000000
mean        36.684543
std         11.344304
min         19.000000
25%         28.000000
50%         33.000000
75%         43.000000
max         71.000000
Name: Edad, dtype: float64

Descripción de la columna 'Renta':
 count    2.836200e+04
mean     5.998911e+05
std      2.351658e+05
min      1.000000e+00
25%      4.495662e+05
50%      5.675099e+05
75%      7.022698e+05
max      1.414396e+06
Name: Renta, dtype: float64

Descripción de la columna 'Sexo':
 count    28362.000000
mean         0.482230
std          0.499693
min          0.000000
25%          0.000000
50%          0.000000
75%          1.000000
max          1.000000
Name: Sexo, dtype: float64

Descripción de la columna 'TC':
 count    28362.000000
mean         1.729109
std          0.862701
min          1.000000
25%          1.000000
50%          2.000000
75%          2.000000
max         12.000000
Name: TC, dtype: float64
```

```
Descripción de la columna 'Cuentas':
 count    28362.000000
mean         1.391545
std          0.528744
min          1.000000
25%          1.000000
50%          1.000000
75%          2.000000
max          5.000000
Name: Cuentas, dtype: float64

Descripción de la columna 'Antiguedad':
 count    28362.000000
mean        32.570764
std         26.166142
min          6.000000
25%         14.000000
50%         24.000000
75%         40.000000
max        121.000000
Name: Antiguedad, dtype: float64

Descripción de la columna 'CUPO_L1':
 count    2.836200e+04
mean     9.195203e+05
std      6.936253e+05
min      0.000000e+00
25%      4.000000e+05
50%      7.500000e+05
75%      1.281112e+06
max      3.276000e+06
Name: CUPO_L1, dtype: float64

Descripción de la columna 'CUPO_MX':
 count    28362.000000
mean      1102.173965
std        940.156354
min          0.000000
25%        400.000000
50%        850.000000
75%       1550.000000
max       4400.000000
Name: CUPO_MX, dtype: float64

Descripción de la columna 'target':
 count    28362.000000
mean         0.085995
```

```
std          0.280362
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max          1.000000
Name: target, dtype: float64
```

[95]:
```
0
Edad          None
Renta         None
Sexo          None
TC            None
Cuentas       None
Antiguedad    None
CUPO_L1       None
CUPO_MX       None
target        None
dtype: object
```

[96]:
```
# Filtrar filas que no contengan valores negativos
df_filtrado = df_preparado[(df_preparado >= 0).all(axis=1)]


# Mostrar las primeras filas del dataframe filtrado
df_filtrado.head(50)
```

[96]:

0	Edad	Renta	Sexo	TC	Cuentas	Antiguedad	CUPO_L1	CUPO_MX	\
1	46	1.436400e+05	0	1	1	69	750000.0	1000.0	
2	45	9.291060e+05	0	2	1	24	1350000.0	1500.0	
5	47	7.076640e+05	0	2	1	67	1312500.0	714.0	
6	48	1.022833e+06	0	2	2	21	813000.0	600.0	
7	46	6.896734e+05	0	3	2	69	1242000.0	1255.0	
8	49	1.171066e+06	0	1	1	33	1996400.0	2000.0	
9	44	9.643870e+05	1	3	1	23	672000.0	1000.0	
12	36	1.263238e+06	0	1	1	80	500000.0	1500.0	
14	48	5.925410e+05	0	1	1	13	400000.0	1000.0	
15	46	6.449081e+05	0	2	2	7	800000.0	1200.0	
16	51	7.523960e+05	1	2	2	22	600000.0	400.0	
20	50	6.916150e+05	1	2	1	18	300000.0	500.0	
22	48	9.917510e+05	0	1	1	18	1250000.0	2000.0	
25	43	8.435560e+05	0	4	2	49	1680000.0	1000.0	
27	43	1.309234e+06	0	1	1	14	600000.0	1000.0	
28	45	1.400000e+06	1	1	1	13	500000.0	800.0	
29	51	6.657003e+05	1	1	1	109	1228000.0	12.0	
31	47	6.820956e+05	0	1	1	72	2872800.0	2850.0	
35	51	6.756576e+05	1	2	2	105	2301000.0	0.0	

36	48	5.281520e+05	0	2	2	27	2160000.0	2000.0
37	48	6.340130e+05	1	1	1	78	650000.0	1500.0
40	49	8.600000e+05	1	3	1	60	1920000.0	1270.0
41	44	1.014542e+06	0	1	1	38	750000.0	500.0
43	50	6.610220e+05	1	2	2	10	1000000.0	1000.0
47	39	1.169226e+06	1	1	1	28	500000.0	500.0
48	44	7.048370e+05	1	2	2	24	2160000.0	2000.0
50	47	7.145790e+05	0	1	1	38	1218000.0	1000.0
51	47	8.161170e+05	0	2	1	26	832000.0	400.0
52	47	9.580470e+05	0	3	2	75	2520000.0	500.0
55	45	6.261525e+05	1	1	1	80	600000.0	500.0
56	37	5.941200e+05	1	2	1	70	1300000.0	2600.0
58	39	6.012840e+05	1	1	1	7	500000.0	500.0
60	50	5.334030e+05	1	4	2	14	600000.0	1000.0
62	47	3.828300e+05	0	3	2	13	400000.0	200.0
63	37	1.003000e+06	1	2	2	48	2579700.0	2350.0
64	47	6.280234e+05	1	1	1	74	1170000.0	1500.0
65	42	1.380653e+06	0	4	2	15	1995000.0	3000.0
67	50	7.388910e+05	1	1	1	30	500000.0	350.0
72	49	1.410000e+05	1	1	1	22	650000.0	450.0
76	45	5.239720e+05	0	1	1	36	1913625.0	750.0
77	50	4.423570e+05	0	2	2	8	1400000.0	1200.0
78	40	2.500000e+05	0	2	2	87	1600000.0	2000.0
79	46	5.093260e+05	1	1	1	35	300000.0	0.0
80	38	5.000000e+05	0	1	1	14	725000.0	800.0
82	42	1.118632e+06	0	2	2	16	2000000.0	3200.0
83	32	3.140170e+05	0	1	1	47	300000.0	1000.0
84	34	5.489570e+05	1	2	2	26	1360000.0	2100.0
86	47	4.281360e+05	0	2	2	24	3000000.0	4000.0
87	44	4.039770e+05	1	1	1	33	710000.0	800.0
88	36	7.019710e+05	1	3	2	20	800000.0	1400.0

0	target
1	0
2	0
5	0
6	0
7	0
8	1
9	0
12	0
14	0
15	0
16	0
20	0
22	0
25	1

```
27       0
28       0
29       0
31       0
35       0
36       0
37       0
40       0
41       0
43       0
47       1
48       0
50       0
51       0
52       0
55       1
56       0
58       0
60       1
62       0
63       0
64       0
65       0
67       0
72       0
76       0
77       0
78       0
79       0
80       0
82       0
83       0
84       0
86       0
87       0
88       0
```

[97]:
```
df_filtrado.apply(lambda col: print(f"\nDescripción de la columna '{col.name}':
  ↪\n", col.describe()))
df_filtrado['Renta'].astype(np.int64).count()
```

```
Descripción de la columna 'Edad':
 count    28362.000000
mean        36.684543
std         11.344304
min         19.000000
```

```
25%         28.000000
50%         33.000000
75%         43.000000
max         71.000000
Name: Edad, dtype: float64

Descripción de la columna 'Renta':
 count    2.836200e+04
mean     5.998911e+05
std      2.351658e+05
min      1.000000e+00
25%      4.495662e+05
50%      5.675099e+05
75%      7.022698e+05
max      1.414396e+06
Name: Renta, dtype: float64

Descripción de la columna 'Sexo':
 count    28362.000000
mean         0.482230
std          0.499693
min          0.000000
25%          0.000000
50%          0.000000
75%          1.000000
max          1.000000
Name: Sexo, dtype: float64

Descripción de la columna 'TC':
 count    28362.000000
mean         1.729109
std          0.862701
min          1.000000
25%          1.000000
50%          2.000000
75%          2.000000
max         12.000000
Name: TC, dtype: float64

Descripción de la columna 'Cuentas':
 count    28362.000000
mean         1.391545
std          0.528744
min          1.000000
25%          1.000000
50%          1.000000
75%          2.000000
max          5.000000
```

```
Name: Cuentas, dtype: float64

Descripción de la columna 'Antiguedad':
 count    28362.000000
mean        32.570764
std         26.166142
min          6.000000
25%         14.000000
50%         24.000000
75%         40.000000
max        121.000000
Name: Antiguedad, dtype: float64

Descripción de la columna 'CUPO_L1':
 count    2.836200e+04
mean     9.195203e+05
std      6.936253e+05
min      0.000000e+00
25%      4.000000e+05
50%      7.500000e+05
75%      1.281112e+06
max      3.276000e+06
Name: CUPO_L1, dtype: float64

Descripción de la columna 'CUPO_MX':
 count    28362.000000
mean      1102.173965
std        940.156354
min          0.000000
25%        400.000000
50%        850.000000
75%       1550.000000
max       4400.000000
Name: CUPO_MX, dtype: float64

Descripción de la columna 'target':
 count    28362.000000
mean         0.085995
std          0.280362
min          0.000000
25%          0.000000
50%          0.000000
75%          0.000000
max          1.000000
Name: target, dtype: float64
```

[97]: 28362

[98]:
```python
# Revisamos cuántos valores faltantes hay por columna
# Iterar por cada columna del DataFrame
for columna in df_filtrado.columns:
    total_faltantes = df_filtrado[columna].isna().sum()
    porcentaje_faltantes = (df_filtrado[columna].isna().mean() * 100)
    tipo_dato = df_filtrado[columna].dtype

    # Mostrar la información de la columna actual
    print(f"Columna: {columna}")
    print(f"  - Total Faltantes: {total_faltantes}")
    print(f"  - Porcentaje Faltantes: {porcentaje_faltantes:.2f}%")
    print(f"  - Tipo de Dato: {tipo_dato}")
    print("-" * 40)

df_filtrado.head(50)
```

```
Columna: Edad
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
Columna: Renta
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: float64
----------------------------------------
Columna: Sexo
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int32
----------------------------------------
Columna: TC
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
Columna: Cuentas
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
Columna: Antiguedad
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
Columna: CUPO_L1
```

```
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: float64
----------------------------------------
Columna: CUPO_MX
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: float64
----------------------------------------
Columna: target
  - Total Faltantes: 0
  - Porcentaje Faltantes: 0.00%
  - Tipo de Dato: int64
----------------------------------------
```

[98]:

0	Edad	Renta	Sexo	TC	Cuentas	Antiguedad	CUPO_L1	CUPO_MX	\
1	46	1.436400e+05	0	1	1	69	750000.0	1000.0	
2	45	9.291060e+05	0	2	1	24	1350000.0	1500.0	
5	47	7.076640e+05	0	2	1	67	1312500.0	714.0	
6	48	1.022833e+06	0	2	2	21	813000.0	600.0	
7	46	6.896734e+05	0	3	2	69	1242000.0	1255.0	
8	49	1.171066e+06	0	1	1	33	1996400.0	2000.0	
9	44	9.643870e+05	1	3	1	23	672000.0	1000.0	
12	36	1.263238e+06	0	1	1	80	500000.0	1500.0	
14	48	5.925410e+05	0	1	1	13	400000.0	1000.0	
15	46	6.449081e+05	0	2	2	7	800000.0	1200.0	
16	51	7.523960e+05	1	2	2	22	600000.0	400.0	
20	50	6.916150e+05	1	2	1	18	300000.0	500.0	
22	48	9.917510e+05	0	1	1	18	1250000.0	2000.0	
25	43	8.435560e+05	0	4	2	49	1680000.0	1000.0	
27	43	1.309234e+06	0	1	1	14	600000.0	1000.0	
28	45	1.400000e+06	1	1	1	13	500000.0	800.0	
29	51	6.657003e+05	1	1	1	109	1228000.0	12.0	
31	47	6.820956e+05	0	1	1	72	2872800.0	2850.0	
35	51	6.756576e+05	1	2	2	105	2301000.0	0.0	
36	48	5.281520e+05	0	2	2	27	2160000.0	2000.0	
37	48	6.340130e+05	1	1	1	78	650000.0	1500.0	
40	49	8.600000e+05	1	3	1	60	1920000.0	1270.0	
41	44	1.014542e+06	0	1	1	38	750000.0	500.0	
43	50	6.610220e+05	1	2	2	10	1000000.0	1000.0	
47	39	1.169226e+06	1	1	1	28	500000.0	500.0	
48	44	7.048370e+05	1	2	2	24	2160000.0	2000.0	
50	47	7.145790e+05	0	1	1	38	1218000.0	1000.0	
51	47	8.161170e+05	0	2	1	26	832000.0	400.0	
52	47	9.580470e+05	0	3	2	75	2520000.0	500.0	
55	45	6.261525e+05	1	1	1	80	600000.0	500.0	
56	37	5.941200e+05	1	2	1	70	1300000.0	2600.0	

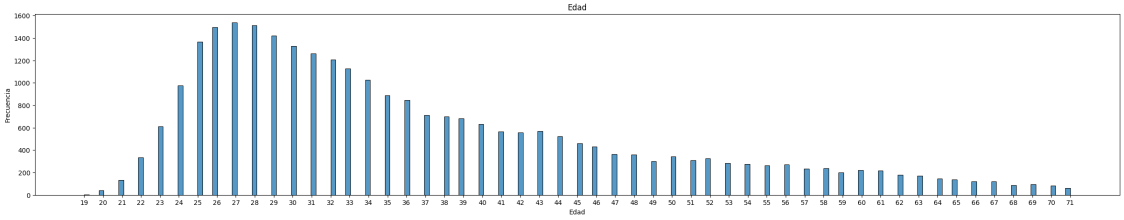
58	39	6.012840e+05	1	1	1	7	500000.0	500.0
60	50	5.334030e+05	1	4	2	14	600000.0	1000.0
62	47	3.828300e+05	0	3	2	13	400000.0	200.0
63	37	1.003000e+06	1	2	2	48	2579700.0	2350.0
64	47	6.280234e+05	1	1	1	74	1170000.0	1500.0
65	42	1.380653e+06	0	4	2	15	1995000.0	3000.0
67	50	7.388910e+05	1	1	1	30	500000.0	350.0
72	49	1.410000e+05	1	1	1	22	650000.0	450.0
76	45	5.239720e+05	0	1	1	36	1913625.0	750.0
77	50	4.423570e+05	0	2	2	8	1400000.0	1200.0
78	40	2.500000e+05	0	2	2	87	1600000.0	2000.0
79	46	5.093260e+05	1	1	1	35	300000.0	0.0
80	38	5.000000e+05	0	1	1	14	725000.0	800.0
82	42	1.118632e+06	0	2	2	16	2000000.0	3200.0
83	32	3.140170e+05	0	1	1	47	300000.0	1000.0
84	34	5.489570e+05	1	2	2	26	1360000.0	2100.0
86	47	4.281360e+05	0	2	2	24	3000000.0	4000.0
87	44	4.039770e+05	1	1	1	33	710000.0	800.0
88	36	7.019710e+05	1	3	2	20	800000.0	1400.0

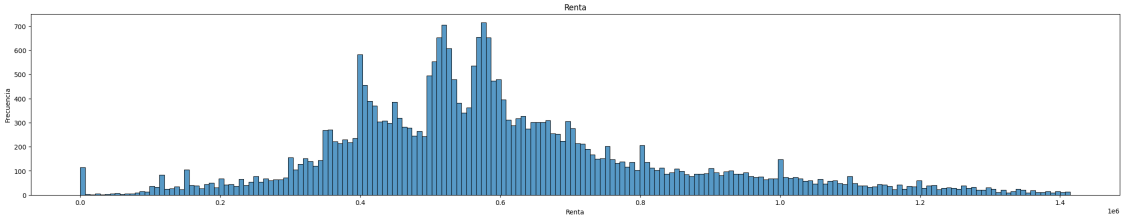
0	target
1	0
2	0
5	0
6	0
7	0
8	1
9	0
12	0
14	0
15	0
16	0
20	0
22	0
25	1
27	0
28	0
29	0
31	0
35	0
36	0
37	0
40	0
41	0
43	0
47	1
48	0

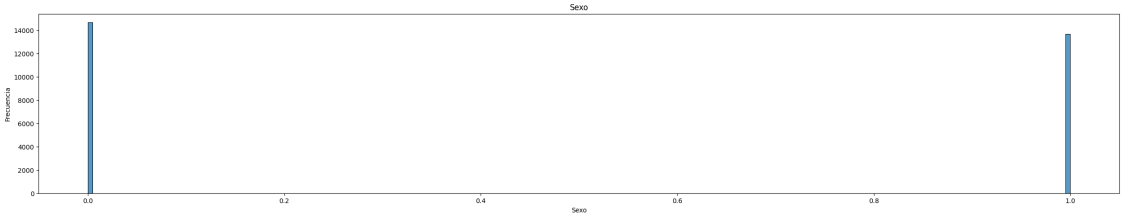
```
50       0
51       0
52       0
55       1
56       0
58       0
60       1
62       0
63       0
64       0
65       0
67       0
72       0
76       0
77       0
78       0
79       0
80       0
82       0
83       0
84       0
86       0
87       0
88       0
```

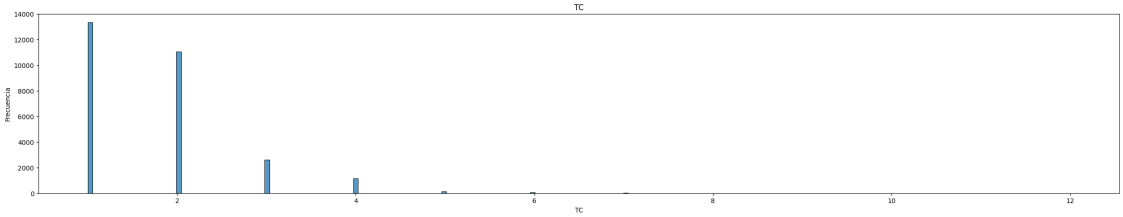
5.3.3 Revisaremos con gráficas el dataframe para guiarnos en los siguientes pasos.

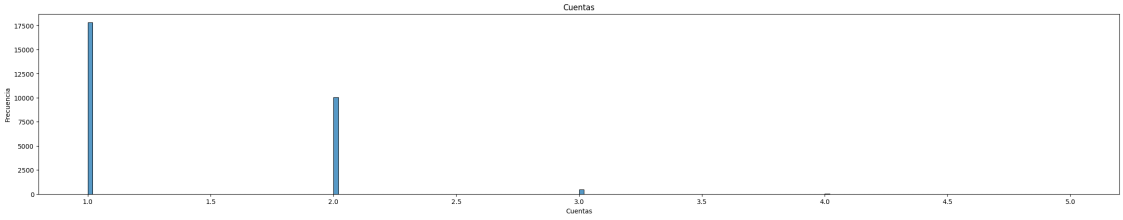
[99]:
```
# Definimos las columnas que queremos analizar en detalle
columnas_para_filtrar = ['Edad', 'Region', 'Antiguedad']

# Iteramos sobre cada columna del DataFrame, excluyendo un gran conjunto de␣
 ↪columnas
for columna in df_filtrado.drop(df_filtrado[['target']], axis=1):
    plt.figure(figsize=(30, 5))
    sb.histplot(df_filtrado[columna], bins=200)
    plt.title(columna)
    plt.xlabel(columna)
    plt.ylabel('Frecuencia')

    # Si la columna está en la lista de columnas a filtrar, ajustamos los␣
 ↪límites de los ejes x
    if columna in columnas_para_filtrar:
        valor_max = df_filtrado[columna].max()
        valor_min = df_filtrado[columna].min()
        plt.xticks(np.arange(valor_min, valor_max + 1, step=1))
        plt.show()
```

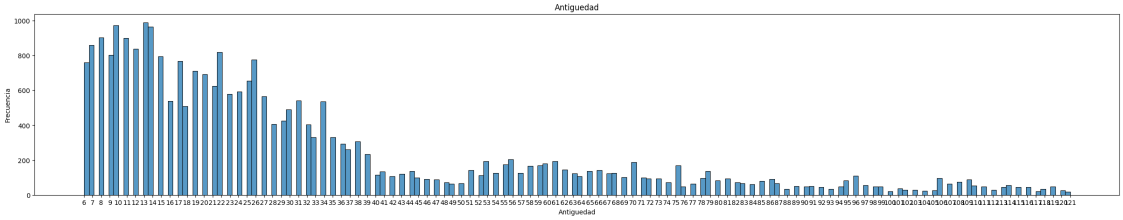

Edad
Frecuencia
Edad

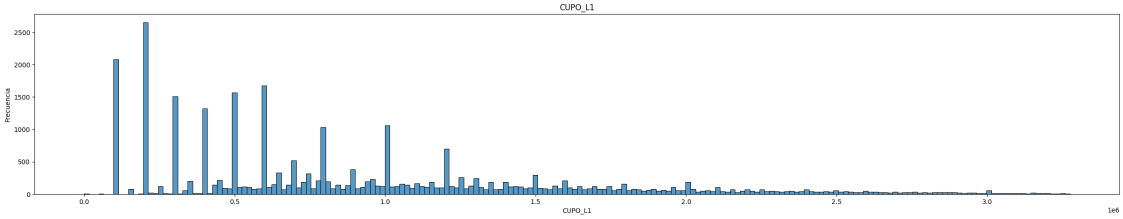

Renta
Frecuencia
Renta
1e6

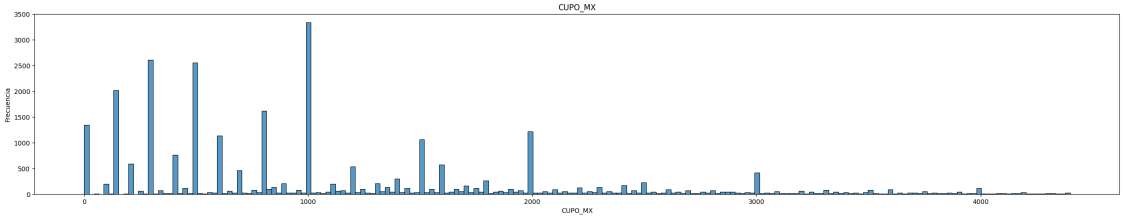

Sexo
Frecuencia
Sexo


TC
Frecuencia
TC


Cuentas
Frecuencia
Cuentas







5.4 Seleccionaremos características

[100]:
```
df_filtrado.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 28362 entries, 1 to 51123
Data columns (total 9 columns):
 #   Column      Non-Null Count  Dtype
---  ------      --------------  -----
 0   Edad        28362 non-null  int64
 1   Renta       28362 non-null  float64
 2   Sexo        28362 non-null  int32
 3   TC          28362 non-null  int64
 4   Cuentas     28362 non-null  int64
 5   Antiguedad  28362 non-null  int64
 6   CUPO_L1     28362 non-null  float64
 7   CUPO_MX     28362 non-null  float64
 8   target      28362 non-null  int64
dtypes: float64(3), int32(1), int64(5)
memory usage: 2.1 MB
```

[101]:
```
df_filtrado_v2 = df_filtrado.copy()

X = df_filtrado_v2.drop(columns=['Renta'])
y = df_filtrado_v2['Renta']
```

5.4.1 Mostramos las 12 características más relevantes para la predicción de la variable objetivo "y" en un conjunto de datos "X" utilizando una prueba estadística de regresión.

[102]:
```
mejores_cat = SelectKBest(score_func=f_regression, k=12)
fit = mejores_cat.fit(X, y)

puntaje_df = pd.DataFrame(fit.scores_)
columnas_df = pd.DataFrame(X.columns)

puntajes_cat = pd.concat([columnas_df, puntaje_df], axis=1)
puntajes_cat.columns = ['Descripción', 'Resultado']

puntajes_cat.nlargest(12, 'Resultado')
```

```
C:\Users\new11\AppData\Local\Packages\PythonSoftwareFoundation.Python.3.12_qbz5n
2kfra8p0\LocalCache\local-packages\Python312\site-
packages\sklearn\feature_selection\_univariate_selection.py:776: UserWarning:
k=12 is greater than n_features=8. All the features will be returned.
  warnings.warn(
```

[102]:

	Descripción	Resultado
5	CUPO_L1	2419.667116
6	CUPO_MX	2018.981429
0	Edad	999.742218
4	Antiguedad	565.746145
1	Sexo	406.118257
2	TC	47.843271
3	Cuentas	27.879612
7	target	0.364288

5.4.2 Obtenemos importancia de características.

[103]:
```
modelo = ExtraTreesRegressor()
modelo.fit(X, y)
```

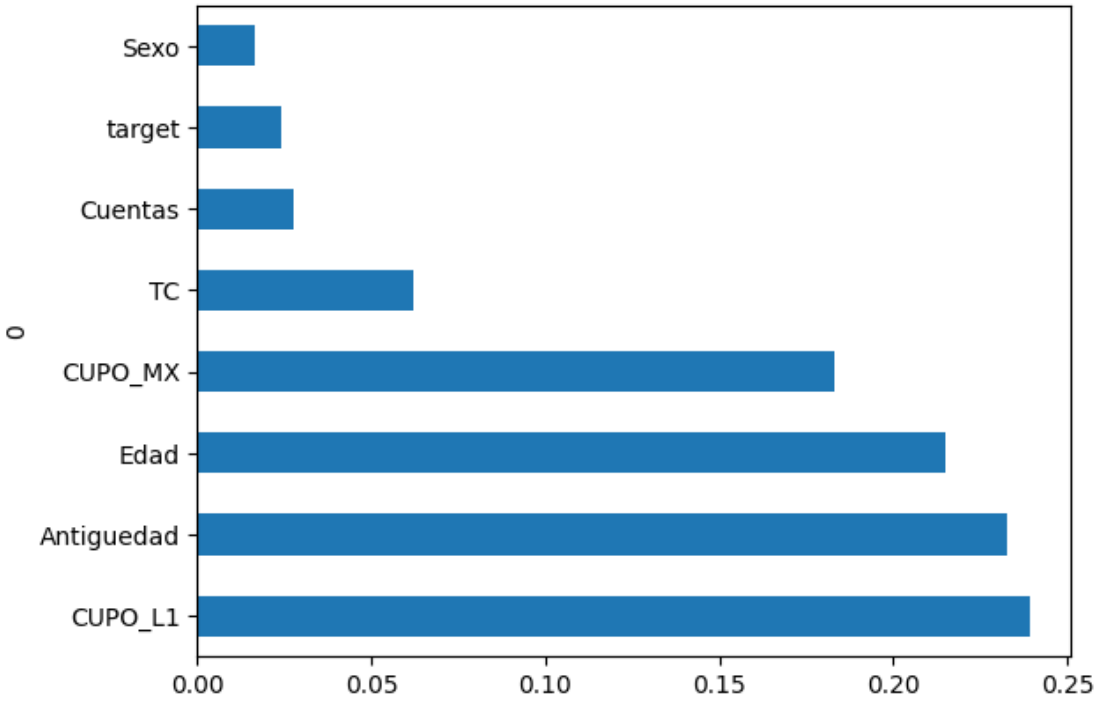
[103]:
```
ExtraTreesRegressor()
```

[104]:
```
print(modelo.feature_importances_)
```

```
[0.21507554 0.01654247 0.06190841 0.02741572 0.23265262 0.2391879
 0.1833439  0.02387345]
```

Mostramos gráficamente.

[109]:
```
importancia_cat = pd.Series(modelo.feature_importances_, index=X.columns)
importancia_cat.nlargest(14).plot(kind='barh')
plt.show()
```



5.4.3 Normalizaremos el dataset.

[110]:
```
# Copia del DataFrame original
df_normalizado = df_filtrado_v2.copy()

# Separar las columnas que van a usarse con StandardScaler
col_standard = ['Edad', 'Antiguedad', 'CUPO_L1', 'CUPO_MX', 'Cuentas', 'Sexo',␣
 ↪'TC']

# Inicializar los escaladores
scaler_standard = StandardScaler()
#scaler_minmax = MinMaxScaler()

# Aplicar StandardScaler
df_normalizado[col_standard] = scaler_standard.
 ↪fit_transform(df_normalizado[col_standard])

# Aplicar MinMaxScaler
```

```
#df_normalizado[col_minmax] = scaler_minmax.
 ↪fit_transform(df_normalizado[col_minmax])

#df_normalizado.to_csv('/Users/herna/Desktop/df_normalizado.csv')
```

[111]:
```
df_normalizado.head(20)
```

[111]:

	Edad	Renta	Sexo	TC	Cuentas	Antiguedad	CUPO_L1	CUPO_MX	target
1	0.821172	1.436400e+05	-0.965069	-0.845162	-0.740532	1.392253	-0.244402	-0.108680	0
2	0.733020	9.291060e+05	-0.965069	0.314009	-0.740532	-0.327557	0.620634	0.423156	0
5	0.909323	7.076640e+05	-0.965069	0.314009	-0.740532	1.315817	0.566569	-0.412890	0
6	0.997475	1.022833e+06	-0.965069	0.314009	1.150776	-0.442211	-0.153573	-0.534148	0
7	0.821172	6.896734e+05	-0.965069	1.473179	1.150776	1.392253	0.464927	0.162557	0
8	1.085626	1.171066e+06	-0.965069	-0.845162	-0.740532	0.016405	1.552565	0.954992	1
9	0.644869	9.643870e+05	1.036195	1.473179	-0.740532	-0.365775	-0.356856	-0.108680	0
12	-0.060343	1.263238e+06	-0.965069	-0.845162	-0.740532	1.812651	-0.604833	0.423156	0
14	0.997475	5.925410e+05	-0.965069	-0.845162	-0.740532	-0.747955	-0.749006	-0.108680	0
15	0.821172	6.449081e+05	-0.965069	0.314009	1.150776	-0.977263	-0.172315	0.104055	0
16	1.261929	7.523960e+05	1.036195	0.314009	1.150776	-0.403993	-0.460661	-0.746883	0
20	1.173778	6.916150e+05	1.036195	0.314009	-0.740532	-0.556865	-0.893178	-0.640515	0
22	0.997475	9.917510e+05	-0.965069	-0.845162	-0.740532	-0.556865	0.476461	0.954992	0
25	0.556717	8.435560e+05	-0.965069	2.632350	1.150776	0.627893	1.096403	-0.108680	1
27	0.556717	1.309234e+06	-0.965069	-0.845162	-0.740532	-0.709737	-0.460661	-0.108680	0
28	0.733020	1.400000e+06	1.036195	-0.845162	-0.740532	-0.747955	-0.604833	-0.321414	0
29	1.261929	6.657003e+05	1.036195	-0.845162	-0.740532	2.920973	0.444743	-1.159587	0
31	0.909323	6.820956e+05	-0.965069	-0.845162	-0.740532	1.506907			
35	1.261929	6.756576e+05	1.036195	0.314009	1.150776	2.768101			
36	0.997475	5.281520e+05	-0.965069	0.314009	1.150776	-0.212903			

```
31  2.816094  1.859113       0
35  1.991715 -1.172351       0
36  1.788432  0.954992       0
```

6 Modeling

7 Evaluation

8 Deployment