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IMPLEMENTACIÓN K-MEANS

REDUCCIÓN DEL ARCHIVO ORIGINAL

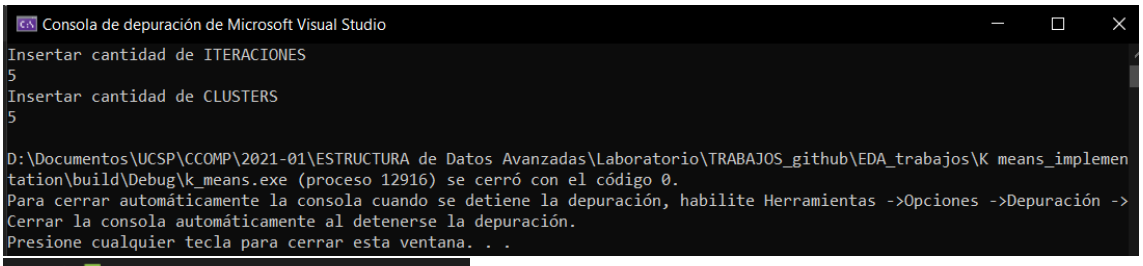
Archivo: source/reducirCSV.ipynb

```
import pandas as pd
data = pd.read_csv('yellow_tripdata_2009-12.csv')
data = data.drop(["vendor_name","Trip_Pickup_DateTime","Trip_Dropoff_DateTime",
"Passenger_Count","Trip_Distance","Rate_Code","store_and_forward","End_Lon",
"End_Lat","Payment_Type","Fare_Amt","surcharge","mta_tax","Tip_Amt","Tolls_Amt",
"Total_Amt"], axis = 1)
data = data.iloc[:500000,]
print(data.info())
data.to_csv("../build/datos_resumidos.csv", index=False, encoding='utf8')
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 500000 entries, 0 to 499999
Data columns (total 2 columns):
 #   Column     Non-Null Count   Dtype
---  ------     --------------   -----
 0   Start_Lon  500000 non-null  float64
 1   Start_Lat  500000 non-null  float64
dtypes: float64(2)
memory usage: 7.6 MB
None
```

GENERACIÓN DE CLUSTER CON K-MEANS

Archivo: source/main.cpp



build > coordenadas.csv

```
longitud,latitud,agrupacion
-73.9879,40.7379,0
-73.956,40.7796,4
-73.9557,40.6895,3
-73.984,40.7546,2
-73.9591,40.7693,4
-73.9822,40.7831,2
0,0,4
-73.9821,40.7768,2
-73.9848,40.7419,1
0,0,4
-73.9912,40.73,0
```

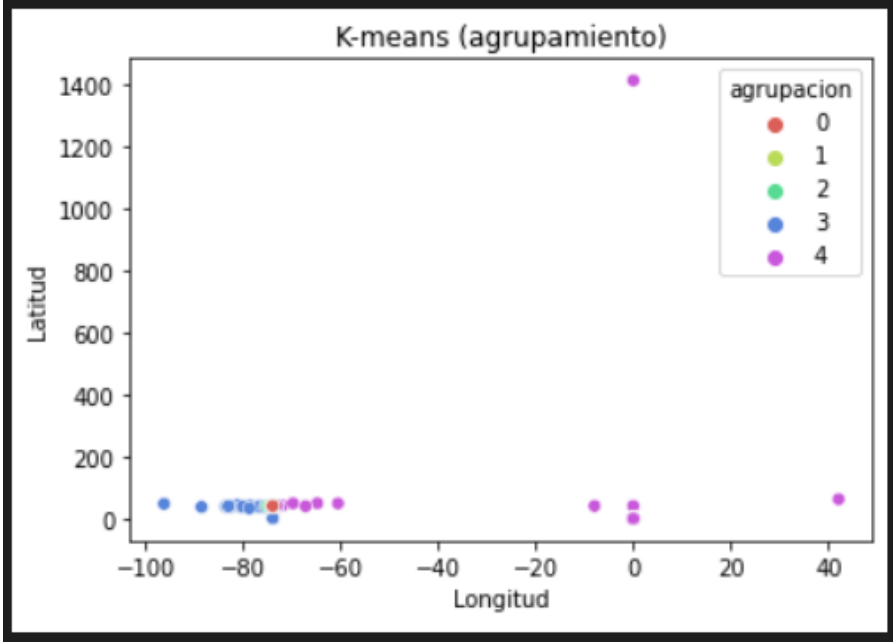
VISUALIZACIÓN DE RESULTADOS

Archivo: source/visualización.ipynb

```
import matplotlib.pyplot as plt
import pandas as pd
import seaborn as sns

plt.figure()
df = pd.read_csv("../build/coordenadas.csv")
sns.scatterplot(x=df.longitud, y=df.latitud,
                hue=df.agrupacion,
                palette=sns.color_palette("hls", n_colors=5))
plt.xlabel("Longitud")
plt.ylabel("Latitud")
plt.title("K-means (agrupamiento)")

plt.show()
```



OTRAS PRUEBAS

Cantidad de datos: 1000000.

```
import pandas as pd
data = pd.read_csv('yellow_tripdata_2009-12.csv')
data = data.drop(["vendor_name","Trip_Pickup_DateTime","Trip_Dropoff_DateTime",
"Passenger_Count","Trip_Distance","Rate_Code","store_and_forward","End_Lon",
"End_Lat","Payment_Type","Fare_Amt","surcharge","mta_tax","Tip_Amt","Tolls_Amt",
"Total_Amt"], axis = 1)
data = data.iloc[:1000000,]
print(data.info())
data.to_csv("../build/datos_resumidos.csv", index=False, encoding='utf8')
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1000000 entries, 0 to 999999
Data columns (total 2 columns):
 #   Column     Non-Null Count    Dtype
---  ------     --------------    -----
 0   Start_Lon  1000000 non-null  float64
 1   Start_Lat  1000000 non-null  float64
dtypes: float64(2)
memory usage: 15.3 MB
None
```

10 iteraciones y 10 clúster. Visualizando con otra gráfica.

```
plt.figure()
df = pd.read_csv("../build/coordenadas.csv")
sns.relplot(x="longitud", y="latitud", data = df, kind = "scatter",
                hue="agrupacion", alpha = 0.4)
#sns.scatterplot(x=df.longitud, y=df.latitud,
#                hue=df.agrupacion,
#                palette=sns.color_palette("hls", n_colors=10))
plt.xlabel("Longitud")
plt.ylabel("Latitud")
plt.title("K-means (agrupamiento)")

plt.show()
```

```
<Figure size 432x288 with 0 Axes>
```