

DSC350 - Term Project - Milestone 2

Cleaning/Formatting a Flat File Source

Perform at least 5 data transformation and/or cleansing steps to your flat file data.

```
===== ; Title: Term Project - Milestone 2 ; Author: Gavin Rehkemper ;  
Date: 26 June 2024 ; Modified By: Tyler Heflin ; Description: This program demonstrates the use of Python for ; modification and  
transformations to flat files. ;===== */
```

We begin the assignment by importing the necessary libraries for completion.

```
In [1]: import pandas as pd
```

Read the original CSV file

```
In [2]: # Define the path to read the file  
file = (r'C:\Users\thefli0\Downloads\mls.csv')  
  
# Read the file to a dataframe  
df = pd.read_csv(file)  
  
# Print the contents  
print(df)
```

	team	city	state	latitude	\
0	Atlanta United FC	Atlanta	Georgia	33.755556	
1	Austin FC	Austin	Texas	30.387700	
2	CF Montréal	Montreal	Quebec	45.563056	
3	Charlotte FC	Charlotte	North Carolina	35.225833	
4	Chicago Fire FC	Chicago	Illinois	41.862300	
5	Colorado Rapids	Commerce City	Colorado	39.805556	
6	Columbus Crew	Columbus	Ohio	39.968461	
7	D.C. United	Washington	D.C.	38.868411	
8	FC Cincinnati	Cincinnati	Ohio	39.111389	
9	FC Dallas	Frisco	Texas	33.154444	
10	Houston Dynamo FC	Houston	Texas	29.752200	
11	Inter Miami CF	Fort Lauderdale	Florida	26.193056	
12	LA Galaxy	Carson	California	33.864000	
13	Los Angeles FC	Los Angeles	California	34.013000	
14	Minnesota United FC	Saint Paul	Minnesota	44.952778	
15	Nashville SC	Nashville	Tennessee	36.130278	
16	New England Revolution	Foxborough	Massachusetts	42.091000	
17	New York City FC	New York City	New York	40.829167	
18	New York Red Bulls	Harrison	New Jersey	40.736667	
19	Orlando City SC	Orlando	Florida	28.541100	
20	Philadelphia Union	Chester	Pennsylvania	39.832222	
21	Portland Timbers	Portland	Oregon	45.521389	
22	Real Salt Lake	Sandy	Utah	40.582900	
23	San Jose Earthquakes	San Jose	California	37.351389	
24	Seattle Sounders FC	Seattle	Washington	47.595200	
25	Sporting Kansas City	Kansas City	Kansas	39.121400	
26	St. Louis City SC	St. Louis	Missouri	38.631389	
27	Toronto FC	Toronto	Ontario	43.632778	
28	Vancouver Whitecaps FC	Vancouver	British Columbia	49.276667	

	longitude	stadium	stadium_capacity	joined	\
0	-84.400000	Mercedes-Benz Stadium	42500	2017	
1	-97.719500	Q2 Stadium	20738	2021	
2	-73.552500	Saputo Stadium	19619	2012	
3	-80.852778	Bank of America Stadium	38000	2022	
4	-87.616700	Soldier Field	24995	1998	
5	-104.891944	Dick's Sporting Goods Park	18061	1996	
6	-83.017089	Lower.com Field	20371	1996	
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12	-118.261000	Dignity Health Sports Park	27000	1996	
13	-118.285000	BMO Stadium	22000	2018	
14	-93.165000	Allianz Field	19400	2017	
15	-86.765556	Geodis Park	30000	2020	
16	-71.264000	Gillette Stadium	20000	1996	
17	-73.926389	Yankee Stadium	30321	2015	
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25	-94.821000	Children's Mercy Park	18467	1996
26	-90.210278	CityPark	22423	2023
27	-79.418611	BMO Field	28351	2007
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		head_coach	url	\
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1	Josh Wolff	https://www.austinfc.com/		
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20	Jim Curtin	https://www.philadelphiaunion.com/		
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24	Brian Schmetzer	https://www.soundersfc.com/		
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26	Bradley Carnell	https://www.stlcitysc.com/		
27	John Herdman	https://www.torontofc.ca/		
28	Vanni Sartini	https://www.whitecapsfc.com/		

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```

Adding a New Column

```
In [3]: # Define the path to read the file
file = (r'C:\Users\thefli0\Downloads\mls.csv')

# Read the file to a dataframe
df = pd.read_csv(file)

# Add 'ID' column with unique identifier
df['ID'] = range(1, len(df) + 1)
# Move 'ID' column for readability
columns = ['ID'] + [col for col in df.columns if col != 'ID']
```

```
df = df[columns]
```

```
# Print contents
```

```
print(df)
```

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28 https://upload.wikimedia.org/wikipedia/en/thum...
```

Replacing Headers

```
In [4]: # Rename the columns for readability
df.rename(columns={
    'team': 'Official_Team_Name',
    'city': 'Team_City',
    'state': 'Team_State',
    'latitude': 'Latitude',
    'longitude': 'Longitude',
    'stadium': 'Stadium_Name',
    'stadium_capacity': 'Stadium_Capacity',
    'joined': 'Year_Joined',
```

```
'head_coach': 'Head_Coach',
'url': 'Website_URL',
'wikipedia_url': 'Wikipedia_URL',
'logo_url': 'Logo_URL'
}, inplace=True)

# Display results
print(df)
```

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15	Gary Smith	https://www.nashvillesc.com/
16	Caleb Porter	https://www.revolutionsoccer.net/
17	Nick Cushing	https://www.nycfc.com/
18	Sandro Schwarz	https://www.newyorkredbulls.com/
19	Óscar Pareja	https://www.orlandocitysc.com/
20	Jim Curtin	https://www.philadelphiaunion.com/
21	Phil Neville	https://www.timbers.com/
22	Pablo Mastroeni	https://www.rsl.com/
23	Luchi Gonzalez	https://www.sjearthquakes.com/
24	Brian Schmetzer	https://www.soundersfc.com/
25	Peter Vermes	https://www.sportingkc.com/
26	Bradley Carnell	https://www.stlcitysc.com/
27	John Herdman	https://www.torontofc.ca/
28	Vanni Sartini	https://www.whitecapsfc.com/

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3	https://en.wikipedia.org/wiki/Charlotte_FC
4	https://en.wikipedia.org/wiki/Chicago_Fire_FC
5	https://en.wikipedia.org/wiki/Colorado_Rapids
6	https://en.wikipedia.org/wiki/Columbus_Crew
7	https://en.wikipedia.org/wiki/D.C._United
8	https://en.wikipedia.org/wiki/FC_Cincinnati
9	https://en.wikipedia.org/wiki/FC_Dallas
10	https://en.wikipedia.org/wiki/Houston_Dynamo_FC
11	https://en.wikipedia.org/wiki/Inter_Miami_CF
12	https://en.wikipedia.org/wiki/LA_Galaxy
13	https://en.wikipedia.org/wiki/Los_Angeles_FC
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17	https://en.wikipedia.org/wiki/New_York_City_FC

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18 https://en.wikipedia.org/wiki/New_York_Red_Bulls
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24 https://en.wikipedia.org/wiki/Seattle_Sounders_FC
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```

Identifying and Handling Missing Values

```
In [5]: # Fill numeric columns with 0 and string columns with "Unknown"
df.fillna({
    'Official_Team_Name': 'Unknown',
    'Team_City': 'Unknown',
    'Team_State': 'Unknown',
    'Latitude': 0.0,
    'Longitude': 0.0,
    'Stadium_Name': 'Unknown',
    'Stadium_Capacity': 0,
    'Year_Joined': 0,
```

```
'Head_Coach': 'Unknown',
'Website_URL': 'Unknown',
'Wikipedia_URL': 'Unknown',
'Logo_URL': 'Unknown',
}, inplace=True)

# Display results
print(df)
```

	ID	Official_Team_Name	Team_City	Team_State	Latitude	\
0	1	Atlanta United FC	Atlanta	Georgia	33.755556	
1	2	Austin FC	Austin	Texas	30.387700	
2	3	CF Montréal	Montreal	Quebec	45.563056	
3	4	Charlotte FC	Charlotte	North Carolina	35.225833	
4	5	Chicago Fire FC	Chicago	Illinois	41.862300	
5	6	Colorado Rapids	Commerce City	Colorado	39.805556	
6	7	Columbus Crew	Columbus	Ohio	39.968461	
7	8	D.C. United	Washington	D.C.	38.868411	
8	9	FC Cincinnati	Cincinnati	Ohio	39.111389	
9	10	FC Dallas	Frisco	Texas	33.154444	
10	11	Houston Dynamo FC	Houston	Texas	29.752200	
11	12	Inter Miami CF	Fort Lauderdale	Florida	26.193056	
12	13	LA Galaxy	Carson	California	33.864000	
13	14	Los Angeles FC	Los Angeles	California	34.013000	
14	15	Minnesota United FC	Saint Paul	Minnesota	44.952778	
15	16	Nashville SC	Nashville	Tennessee	36.130278	
16	17	New England Revolution	Foxborough	Massachusetts	42.091000	
17	18	New York City FC	New York City	New York	40.829167	
18	19	New York Red Bulls	Harrison	New Jersey	40.736667	
19	20	Orlando City SC	Orlando	Florida	28.541100	
20	21	Philadelphia Union	Chester	Pennsylvania	39.832222	
21	22	Portland Timbers	Portland	Oregon	45.521389	
22	23	Real Salt Lake	Sandy	Utah	40.582900	
23	24	San Jose Earthquakes	San Jose	California	37.351389	
24	25	Seattle Sounders FC	Seattle	Washington	47.595200	
25	26	Sporting Kansas City	Kansas City	Kansas	39.121400	
26	27	St. Louis City SC	St. Louis	Missouri	38.631389	
27	28	Toronto FC	Toronto	Ontario	43.632778	
28	29	Vancouver Whitecaps FC	Vancouver	British Columbia	49.276667	

	Longitude	Stadium_Name	Stadium_Capacity	Year_Joined	\
0	-84.400000	Mercedes-Benz Stadium	42500	2017	
1	-97.719500	Q2 Stadium	20738	2021	
2	-73.552500	Saputo Stadium	19619	2012	
3	-80.852778	Bank of America Stadium	38000	2022	
4	-87.616700	Soldier Field	24995	1998	
5	-104.891944	Dick's Sporting Goods Park	18061	1996	
6	-83.017089	Lower.com Field	20371	1996	
7	-77.012869	Audi Field	20000	1996	
8	-84.522222	TQL Stadium	26000	2019	
9	-96.835278	Toyota Stadium	19096	1996	
10	-95.352400	Shell Energy Stadium	22039	2006	
11	-80.161111	DRV PNK Stadium	21000	2020	
12	-118.261000	Dignity Health Sports Park	27000	1996	
13	-118.285000	BMO Stadium	22000	2018	
14	-93.165000	Allianz Field	19400	2017	
15	-86.765556	Geodis Park	30000	2020	
16	-71.264000	Gillette Stadium	20000	1996	
17	-73.926389	Yankee Stadium	30321	2015	
18	-74.150278	Red Bull Arena	25000	1996	
19	-81.389300	Inter&Co Stadium	25500	2015	
20	-75.378889	Subaru Park	18500	2010	
21	-122.691667	Providence Park	25218	2011	
22	-111.893400	America First Field	20213	2005	
23	-121.925000	PayPal Park	18000	1996	

24	-122.331600	Lumen Field	37722	2009
25	-94.821000	Children's Mercy Park	18467	1996
26	-90.210278	CityPark	22423	2023
27	-79.418611	BMO Field	28351	2007
28	-123.111944	BC Place	22120	2011

	Head_Coach	Website_URL \
0	Gonzalo Pineda	https://www.atlutd.com/
1	Josh Wolff	https://www.austinfc.com/
2	Laurent Courtois	https://www.cfmontreal.com/
3	Dean Smith	https://www.charlottefootballclub.com/
4	Frank Klopas	https://www.chicagofirefc.com/
5	Chris Armas	https://www.coloradorapids.com/
6	Wilfried Nancy	http://columbuscrew.com/
7	Troy Lesesne	https://www.dcunited.com/
8	Pat Noonan	https://www.fccincinnati.com/
9	Nico Estévez	https://www.fcdallas.com/
10	Ben Olsen	https://www.houstondynamo.com/
11	Gerardo Martino	https://www.intermiamicf.com/
12	Greg Vanney	https://www.lagalaxy.com/
13	Steve Cherundolo	https://www.lafc.com/
14	Cameron Knowles	https://www.mnufc.com/
15	Gary Smith	https://www.nashvillesc.com/
16	Caleb Porter	https://www.revolutionsoccer.net/
17	Nick Cushing	https://www.nycfc.com/
18	Sandro Schwarz	https://www.newyorkredbulls.com/
19	Óscar Pareja	https://www.orlandocitysc.com/
20	Jim Curtin	https://www.philadelphiaunion.com/
21	Phil Neville	https://www.timbers.com/
22	Pablo Mastroeni	https://www.rsl.com/
23	Luchi Gonzalez	https://www.sjearthquakes.com/
24	Brian Schmetzer	https://www.soundersfc.com/
25	Peter Vermes	https://www.sportingkc.com/
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5	https://en.wikipedia.org/wiki/Colorado_Rapids
6	https://en.wikipedia.org/wiki/Columbus_Crew
7	https://en.wikipedia.org/wiki/D.C._United
8	https://en.wikipedia.org/wiki/FC_Cincinnati
9	https://en.wikipedia.org/wiki/FC_Dallas
10	https://en.wikipedia.org/wiki/Houston_Dynamo_FC
11	https://en.wikipedia.org/wiki/Inter_Miami_CF
12	https://en.wikipedia.org/wiki/LA_Galaxy
13	https://en.wikipedia.org/wiki/Los_Angeles_FC
14	https://en.wikipedia.org/wiki/Minnesota_United_FC
15	https://en.wikipedia.org/wiki/Nashville_SC
16	https://en.wikipedia.org/wiki/New_England_Revo...
17	https://en.wikipedia.org/wiki/New_York_City_FC

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18 https://en.wikipedia.org/wiki/New_York_Red_Bulls
19     https://en.wikipedia.org/wiki/Orlando_City_SC
20 https://en.wikipedia.org/wiki/Philadelphia_Union
21     https://en.wikipedia.org/wiki/Portland_Timbers
22     https://en.wikipedia.org/wiki/Real_Salt_Lake
23 https://en.wikipedia.org/wiki/San_Jose_Earthqu...
24 https://en.wikipedia.org/wiki/Seattle_Sounders_FC
25 https://en.wikipedia.org/wiki/Sporting_Kansas_...
26     https://en.wikipedia.org/wiki/St._Louis_City_SC
27         https://en.wikipedia.org/wiki/Toronto_FC
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```

Identifying and Handling Duplicates

```
In [6]: # Identify duplicates based only on the 'Official_Team_Name' column
df.drop_duplicates(subset='Official_Team_Name', inplace=True)

# Display results
print(df)
```

	ID	Official_Team_Name	Team_City	Team_State	Latitude	\
0	1	Atlanta United FC	Atlanta	Georgia	33.755556	
1	2	Austin FC	Austin	Texas	30.387700	
2	3	CF Montréal	Montreal	Quebec	45.563056	
3	4	Charlotte FC	Charlotte	North Carolina	35.225833	
4	5	Chicago Fire FC	Chicago	Illinois	41.862300	
5	6	Colorado Rapids	Commerce City	Colorado	39.805556	
6	7	Columbus Crew	Columbus	Ohio	39.968461	
7	8	D.C. United	Washington	D.C.	38.868411	
8	9	FC Cincinnati	Cincinnati	Ohio	39.111389	
9	10	FC Dallas	Frisco	Texas	33.154444	
10	11	Houston Dynamo FC	Houston	Texas	29.752200	
11	12	Inter Miami CF	Fort Lauderdale	Florida	26.193056	
12	13	LA Galaxy	Carson	California	33.864000	
13	14	Los Angeles FC	Los Angeles	California	34.013000	
14	15	Minnesota United FC	Saint Paul	Minnesota	44.952778	
15	16	Nashville SC	Nashville	Tennessee	36.130278	
16	17	New England Revolution	Foxborough	Massachusetts	42.091000	
17	18	New York City FC	New York City	New York	40.829167	
18	19	New York Red Bulls	Harrison	New Jersey	40.736667	
19	20	Orlando City SC	Orlando	Florida	28.541100	
20	21	Philadelphia Union	Chester	Pennsylvania	39.832222	
21	22	Portland Timbers	Portland	Oregon	45.521389	
22	23	Real Salt Lake	Sandy	Utah	40.582900	
23	24	San Jose Earthquakes	San Jose	California	37.351389	
24	25	Seattle Sounders FC	Seattle	Washington	47.595200	
25	26	Sporting Kansas City	Kansas City	Kansas	39.121400	
26	27	St. Louis City SC	St. Louis	Missouri	38.631389	
27	28	Toronto FC	Toronto	Ontario	43.632778	
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	Longitude	Stadium_Name	Stadium_Capacity	Year_Joined	\
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3	-80.852778	Bank of America Stadium	38000	2022	
4	-87.616700	Soldier Field	24995	1998	
5	-104.891944	Dick's Sporting Goods Park	18061	1996	
6	-83.017089	Lower.com Field	20371	1996	
7	-77.012869	Audi Field	20000	1996	
8	-84.522222	TQL Stadium	26000	2019	
9	-96.835278	Toyota Stadium	19096	1996	
10	-95.352400	Shell Energy Stadium	22039	2006	
11	-80.161111	DRV PNK Stadium	21000	2020	
12	-118.261000	Dignity Health Sports Park	27000	1996	
13	-118.285000	BMO Stadium	22000	2018	
14	-93.165000	Allianz Field	19400	2017	
15	-86.765556	Geodis Park	30000	2020	
16	-71.264000	Gillette Stadium	20000	1996	
17	-73.926389	Yankee Stadium	30321	2015	
18	-74.150278	Red Bull Arena	25000	1996	
19	-81.389300	Inter&Co Stadium	25500	2015	
20	-75.378889	Subaru Park	18500	2010	
21	-122.691667	Providence Park	25218	2011	
22	-111.893400	America First Field	20213	2005	
23	-121.925000	PayPal Park	18000	1996	

24	-122.331600	Lumen Field	37722	2009
25	-94.821000	Children's Mercy Park	18467	1996
26	-90.210278	CityPark	22423	2023
27	-79.418611	BMO Field	28351	2007
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4	Frank Klopas	https://www.chicagofirefc.com/		
5	Chris Armas	https://www.coloradorapids.com/		
6	Wilfried Nancy	http://columbuscrew.com/		
7	Troy Lesesne	https://www.dcunited.com/		
8	Pat Noonan	https://www.fccincinnati.com/		
9	Nico Estévez	https://www.fcdallas.com/		
10	Ben Olsen	https://www.houstondynamo.com/		
11	Gerardo Martino	https://www.intermiamicf.com/		
12	Greg Vanney	https://www.lagalaxy.com/		
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14	Cameron Knowles	https://www.mnufc.com/		
15	Gary Smith	https://www.nashvillessc.com/		
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21	Phil Neville	https://www.timbers.com/		
22	Pablo Mastroeni	https://www.rsl.com/		
23	Luchi Gonzalez	https://www.sjearthquakes.com/		
24	Brian Schmetzer	https://www.soundersfc.com/		
25	Peter Vermes	https://www.sportingkc.com/		
26	Bradley Carnell	https://www.stlcitysc.com/		
27	John Herdman	https://www.torontofc.ca/		
28	Vanni Sartini	https://www.whitecapsfc.com/		

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4		https://en.wikipedia.org/wiki/Chicago_Fire_FC	
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7		https://en.wikipedia.org/wiki/D.C._United	
8		https://en.wikipedia.org/wiki/FC_Cincinnati	
9		https://en.wikipedia.org/wiki/FC_Dallas	
10		https://en.wikipedia.org/wiki/Houston_Dynamo_FC	
11		https://en.wikipedia.org/wiki/Inter_Miami_CF	
12		https://en.wikipedia.org/wiki/LA_Galaxy	
13		https://en.wikipedia.org/wiki/Los_Angeles_FC	
14		https://en.wikipedia.org/wiki/Minnesota_United_FC	
15		https://en.wikipedia.org/wiki/Nashville_SC	
16		https://en.wikipedia.org/wiki/New_England_Revo...	
17		https://en.wikipedia.org/wiki/New_York_City_FC	

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18 https://en.wikipedia.org/wiki/New_York_Red_Bulls
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22 https://en.wikipedia.org/wiki/Real_Salt_Lake
23 https://en.wikipedia.org/wiki/San_Jose_Earthqu...
24 https://en.wikipedia.org/wiki/Seattle_Sounders_FC
25 https://en.wikipedia.org/wiki/Sporting_Kansas_...
26 https://en.wikipedia.org/wiki/St._Louis_City_SC
27 https://en.wikipedia.org/wiki/Toronto_FC
28 https://en.wikipedia.org/wiki/Vancouver_Whitec...

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```

Formatting Dates

```
In [7]: # Format the 'Year_Joined' column to ensure proper format
df['Year_Joined'] = pd.to_numeric(df['Year_Joined'], errors='coerce').fillna(0).ast
# If different format, try to convert to correct format
# Handle any invalid years
df['Year_Joined'] = df['Year_Joined'].apply(lambda x: x if x > 0 else None)

# Display results
print(df)
```

	ID	Official_Team_Name	Team_City	Team_State	Latitude	\
0	1	Atlanta United FC	Atlanta	Georgia	33.755556	
1	2	Austin FC	Austin	Texas	30.387700	
2	3	CF Montréal	Montreal	Quebec	45.563056	
3	4	Charlotte FC	Charlotte	North Carolina	35.225833	
4	5	Chicago Fire FC	Chicago	Illinois	41.862300	
5	6	Colorado Rapids	Commerce City	Colorado	39.805556	
6	7	Columbus Crew	Columbus	Ohio	39.968461	
7	8	D.C. United	Washington	D.C.	38.868411	
8	9	FC Cincinnati	Cincinnati	Ohio	39.111389	
9	10	FC Dallas	Frisco	Texas	33.154444	
10	11	Houston Dynamo FC	Houston	Texas	29.752200	
11	12	Inter Miami CF	Fort Lauderdale	Florida	26.193056	
12	13	LA Galaxy	Carson	California	33.864000	
13	14	Los Angeles FC	Los Angeles	California	34.013000	
14	15	Minnesota United FC	Saint Paul	Minnesota	44.952778	
15	16	Nashville SC	Nashville	Tennessee	36.130278	
16	17	New England Revolution	Foxborough	Massachusetts	42.091000	
17	18	New York City FC	New York City	New York	40.829167	
18	19	New York Red Bulls	Harrison	New Jersey	40.736667	
19	20	Orlando City SC	Orlando	Florida	28.541100	
20	21	Philadelphia Union	Chester	Pennsylvania	39.832222	
21	22	Portland Timbers	Portland	Oregon	45.521389	
22	23	Real Salt Lake	Sandy	Utah	40.582900	
23	24	San Jose Earthquakes	San Jose	California	37.351389	
24	25	Seattle Sounders FC	Seattle	Washington	47.595200	
25	26	Sporting Kansas City	Kansas City	Kansas	39.121400	
26	27	St. Louis City SC	St. Louis	Missouri	38.631389	
27	28	Toronto FC	Toronto	Ontario	43.632778	
28	29	Vancouver Whitecaps FC	Vancouver	British Columbia	49.276667	

	Longitude	Stadium_Name	Stadium_Capacity	Year_Joined	\
0	-84.400000	Mercedes-Benz Stadium	42500	2017	
1	-97.719500	Q2 Stadium	20738	2021	
2	-73.552500	Saputo Stadium	19619	2012	
3	-80.852778	Bank of America Stadium	38000	2022	
4	-87.616700	Soldier Field	24995	1998	
5	-104.891944	Dick's Sporting Goods Park	18061	1996	
6	-83.017089	Lower.com Field	20371	1996	
7	-77.012869	Audi Field	20000	1996	
8	-84.522222	TQL Stadium	26000	2019	
9	-96.835278	Toyota Stadium	19096	1996	
10	-95.352400	Shell Energy Stadium	22039	2006	
11	-80.161111	DRV PNK Stadium	21000	2020	
12	-118.261000	Dignity Health Sports Park	27000	1996	
13	-118.285000	BMO Stadium	22000	2018	
14	-93.165000	Allianz Field	19400	2017	
15	-86.765556	Geodis Park	30000	2020	
16	-71.264000	Gillette Stadium	20000	1996	
17	-73.926389	Yankee Stadium	30321	2015	
18	-74.150278	Red Bull Arena	25000	1996	
19	-81.389300	Inter&Co Stadium	25500	2015	
20	-75.378889	Subaru Park	18500	2010	
21	-122.691667	Providence Park	25218	2011	
22	-111.893400	America First Field	20213	2005	
23	-121.925000	PayPal Park	18000	1996	

24	-122.331600	Lumen Field	37722	2009
25	-94.821000	Children's Mercy Park	18467	1996
26	-90.210278	CityPark	22423	2023
27	-79.418611	BMO Field	28351	2007
28	-123.111944	BC Place	22120	2011

		Head_Coach	Website_URL	\
0	Gonzalo Pineda	https://www.atlutd.com/		
1	Josh Wolff	https://www.austinfc.com/		
2	Laurent Courtois	https://www.cfmontreal.com/		
3	Dean Smith	https://www.charlottefootballclub.com/		
4	Frank Klopas	https://www.chicagofirefc.com/		
5	Chris Armas	https://www.coloradorapids.com/		
6	Wilfried Nancy	http://columbuscrew.com/		
7	Troy Lesesne	https://www.dcunited.com/		
8	Pat Noonan	https://www.fccincinnati.com/		
9	Nico Estévez	https://www.fcdallas.com/		
10	Ben Olsen	https://www.houstondynamo.com/		
11	Gerardo Martino	https://www.intermiamicf.com/		
12	Greg Vanney	https://www.lagalaxy.com/		
13	Steve Cherundolo	https://www.lafc.com/		
14	Cameron Knowles	https://www.mnufc.com/		
15	Gary Smith	https://www.nashvillessc.com/		
16	Caleb Porter	https://www.revolutionsoccer.net/		
17	Nick Cushing	https://www.nycfc.com/		
18	Sandro Schwarz	https://www.newyorkredbulls.com/		
19	Óscar Pareja	https://www.orlandocitysc.com/		
20	Jim Curtin	https://www.philadelphiaunion.com/		
21	Phil Neville	https://www.timbers.com/		
22	Pablo Mastroeni	https://www.rsl.com/		
23	Luchi Gonzalez	https://www.sjearthquakes.com/		
24	Brian Schmetzer	https://www.soundersfc.com/		
25	Peter Vermes	https://www.sportingkc.com/		
26	Bradley Carnell	https://www.stlcitysc.com/		
27	John Herdman	https://www.torontofc.ca/		
28	Vanni Sartini	https://www.whitecapsfc.com/		

		Wikipedia_URL	\
0		https://en.wikipedia.org/wiki/Atlanta_United_FC	
1		https://en.wikipedia.org/wiki/Austin_FC	
2		https://en.wikipedia.org/wiki/CF_Montr%C3%A9al	
3		https://en.wikipedia.org/wiki/Charlotte_FC	
4		https://en.wikipedia.org/wiki/Chicago_Fire_FC	
5		https://en.wikipedia.org/wiki/Colorado_Rapids	
6		https://en.wikipedia.org/wiki/Columbus_Crew	
7		https://en.wikipedia.org/wiki/D.C._United	
8		https://en.wikipedia.org/wiki/FC_Cincinnati	
9		https://en.wikipedia.org/wiki/FC_Dallas	
10		https://en.wikipedia.org/wiki/Houston_Dynamo_FC	
11		https://en.wikipedia.org/wiki/Inter_Miami_CF	
12		https://en.wikipedia.org/wiki/LA_Galaxy	
13		https://en.wikipedia.org/wiki/Los_Angeles_FC	
14		https://en.wikipedia.org/wiki/Minnesota_United_FC	
15		https://en.wikipedia.org/wiki/Nashville_SC	
16		https://en.wikipedia.org/wiki/New_England_Revo...	
17		https://en.wikipedia.org/wiki/New_York_City_FC	

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19 https://en.wikipedia.org/wiki/Orlando_City_SC
20 https://en.wikipedia.org/wiki/Philadelphia_Union
21 https://en.wikipedia.org/wiki/Portland_Timbers
22 https://en.wikipedia.org/wiki/Real_Salt_Lake
23 https://en.wikipedia.org/wiki/San_Jose_Earthqu...
24 https://en.wikipedia.org/wiki/Seattle_Sounders_FC
25 https://en.wikipedia.org/wiki/Sporting_Kansas_...
26 https://en.wikipedia.org/wiki/St._Louis_City_SC
27 https://en.wikipedia.org/wiki/Toronto_FC
28 https://en.wikipedia.org/wiki/Vancouver_Whitec...

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```

Combine Latitude and Longitude Columns

```
In [8]: # Combine the two columns
df['Stadium_Coordinates'] = df['Latitude'].astype(str) + ', ' + df['Longitude'].ast

# Remove the individual columns for each
df.drop(columns=['Latitude', 'Longitude'], inplace=True)

# Rearrange new column for readability
columns = df.columns.tolist()
columns.insert(4, columns.pop(columns.index('Stadium_Coordinates')))
df = df[columns]
```

```
# Display results  
print(df)
```

	ID	Official_Team_Name	Team_City	Team_State	\
0	1	Atlanta United FC	Atlanta	Georgia	
1	2	Austin FC	Austin	Texas	
2	3	CF Montréal	Montreal	Quebec	
3	4	Charlotte FC	Charlotte	North Carolina	
4	5	Chicago Fire FC	Chicago	Illinois	
5	6	Colorado Rapids	Commerce City	Colorado	
6	7	Columbus Crew	Columbus	Ohio	
7	8	D.C. United	Washington	D.C.	
8	9	FC Cincinnati	Cincinnati	Ohio	
9	10	FC Dallas	Frisco	Texas	
10	11	Houston Dynamo FC	Houston	Texas	
11	12	Inter Miami CF	Fort Lauderdale	Florida	
12	13	LA Galaxy	Carson	California	
13	14	Los Angeles FC	Los Angeles	California	
14	15	Minnesota United FC	Saint Paul	Minnesota	
15	16	Nashville SC	Nashville	Tennessee	
16	17	New England Revolution	Foxborough	Massachusetts	
17	18	New York City FC	New York City	New York	
18	19	New York Red Bulls	Harrison	New Jersey	
19	20	Orlando City SC	Orlando	Florida	
20	21	Philadelphia Union	Chester	Pennsylvania	
21	22	Portland Timbers	Portland	Oregon	
22	23	Real Salt Lake	Sandy	Utah	
23	24	San Jose Earthquakes	San Jose	California	
24	25	Seattle Sounders FC	Seattle	Washington	
25	26	Sporting Kansas City	Kansas City	Kansas	
26	27	St. Louis City SC	St. Louis	Missouri	
27	28	Toronto FC	Toronto	Ontario	
28	29	Vancouver Whitecaps FC	Vancouver	British Columbia	

	Stadium_Coordinates	Stadium_Name	Stadium_Capacity	\
0	33.75555556, -84.4	Mercedes-Benz Stadium	42500	
1	30.3877, -97.7195	Q2 Stadium	20738	
2	45.56305556, -73.5525	Saputo Stadium	19619	
3	35.22583333, -80.85277778	Bank of America Stadium	38000	
4	41.8623, -87.6167	Soldier Field	24995	
5	39.80555556, -104.89194444	Dick's Sporting Goods Park	18061	
6	39.96846111, -83.01708889	Lower.com Field	20371	
7	38.868411, -77.012869	Audi Field	20000	
8	39.11138889, -84.52222222	TQL Stadium	26000	
9	33.15444444, -96.83527778	Toyota Stadium	19096	
10	29.7522, -95.3524	Shell Energy Stadium	22039	
11	26.19305556, -80.16111111	DRV PNK Stadium	21000	
12	33.864, -118.261	Dignity Health Sports Park	27000	
13	34.013, -118.285	BMO Stadium	22000	
14	44.95277778, -93.165	Allianz Field	19400	
15	36.13027778, -86.76555556	Geodis Park	30000	
16	42.091, -71.264	Gillette Stadium	20000	
17	40.82916667, -73.92638889	Yankee Stadium	30321	
18	40.73666667, -74.15027778	Red Bull Arena	25000	
19	28.5411, -81.3893	Inter&Co Stadium	25500	
20	39.83222222, -75.37888889	Subaru Park	18500	
21	45.52138889, -122.69166667	Providence Park	25218	
22	40.5829, -111.8934	America First Field	20213	
23	37.35138889, -121.925	PayPal Park	18000	

24	47.5952, -122.3316	Lumen Field	37722
25	39.1214, -94.821	Children's Mercy Park	18467
26	38.63138889, -90.21027778	CityPark	22423
27	43.63277778, -79.41861111	BMO Field	28351
28	49.27666667, -123.11194444	BC Place	22120

	Year_Joined	Head_Coach	Website_URL \
0	2017	Gonzalo Pineda	https://www.atlutd.com/
1	2021	Josh Wolff	https://www.austinfc.com/
2	2012	Laurent Courtois	https://www.cfmontreal.com/
3	2022	Dean Smith	https://www.charlottefootballclub.com/
4	1998	Frank Klopas	https://www.chicagofirefc.com/
5	1996	Chris Armas	https://www.coloradorapids.com/
6	1996	Wilfried Nancy	http://columbuscrew.com/
7	1996	Troy Lesesne	https://www.dcunited.com/
8	2019	Pat Noonan	https://www.fccincinnati.com/
9	1996	Nico Estévez	https://www.fcdallas.com/
10	2006	Ben Olsen	https://www.houstondynamo.com/
11	2020	Gerardo Martino	https://www.intermiamicf.com/
12	1996	Greg Vanney	https://www.lagalaxy.com/
13	2018	Steve Cherundolo	https://www.lafc.com/
14	2017	Cameron Knowles	https://www.mnufc.com/
15	2020	Gary Smith	https://www.nashvillesc.com/
16	1996	Caleb Porter	https://www.revolutionsoccer.net/
17	2015	Nick Cushing	https://www.nycfc.com/
18	1996	Sandro Schwarz	https://www.newyorkredbulls.com/
19	2015	Óscar Pareja	https://www.orlandocitysc.com/
20	2010	Jim Curtin	https://www.philadelphiaunion.com/
21	2011	Phil Neville	https://www.timbers.com/
22	2005	Pablo Mastroeni	https://www.rsl.com/
23	1996	Luchi Gonzalez	https://www.sjearthquakes.com/
24	2009	Brian Schmetzer	https://www.soundersfc.com/
25	1996	Peter Vermes	https://www.sportingkc.com/
26	2023	Bradley Carnell	https://www.stlcitysc.com/
27	2007	John Herdman	https://www.torontofc.ca/
28	2011	Vanni Sartini	https://www.whitecapsfc.com/

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3	https://en.wikipedia.org/wiki/Charlotte_FC
4	https://en.wikipedia.org/wiki/Chicago_Fire_FC
5	https://en.wikipedia.org/wiki/Colorado_Rapids
6	https://en.wikipedia.org/wiki/Columbus_Crew
7	https://en.wikipedia.org/wiki/D.C._United
8	https://en.wikipedia.org/wiki/FC_Cincinnati
9	https://en.wikipedia.org/wiki/FC_Dallas
10	https://en.wikipedia.org/wiki/Houston_Dynamo_FC
11	https://en.wikipedia.org/wiki/Inter_Miami_CF
12	https://en.wikipedia.org/wiki/LA_Galaxy
13	https://en.wikipedia.org/wiki/Los_Angeles_FC
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17	https://en.wikipedia.org/wiki/New_York_City_FC

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19     https://en.wikipedia.org/wiki/Orlando_City_SC
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24 https://en.wikipedia.org/wiki/Seattle_Sounders_FC
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26     https://en.wikipedia.org/wiki/St._Louis_City_SC
27         https://en.wikipedia.org/wiki/Toronto_FC
28 https://en.wikipedia.org/wiki/Vancouver_Whitec...
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28 https://upload.wikimedia.org/wikipedia/en/thum...
```

Save Updated DataFrame to New File

```
In [9]: # Save updated DataFrame that has been cleaned and transformed
output_file = r'C:\Users\thefli0\Downloads\mls_cleaned.csv'
df.to_csv(output_file, index=False)

# Display result and ensure file creation
print(f"New cleaned and transformed DataFrame saved as {output_file}")
```

```
New cleaned and transformed DataFrame saved as C:\Users\thefli0\Downloads\mls_cleaned.csv
```