Python Project Assignment

The difficulty of this assignment has been tuned to provide more open ended goal rather than just giving you the task so that you can polish your problem solving skills along with logic building skills.
Best Of Luck!
Do not take any help from any AI tool. Try to complete it by yourself.

Importing the dataset

- Use of Pandas is restricted for this assignment
- Use the csv library to import the artworks dataset

In [1]:
```
1 from csv import reader
```

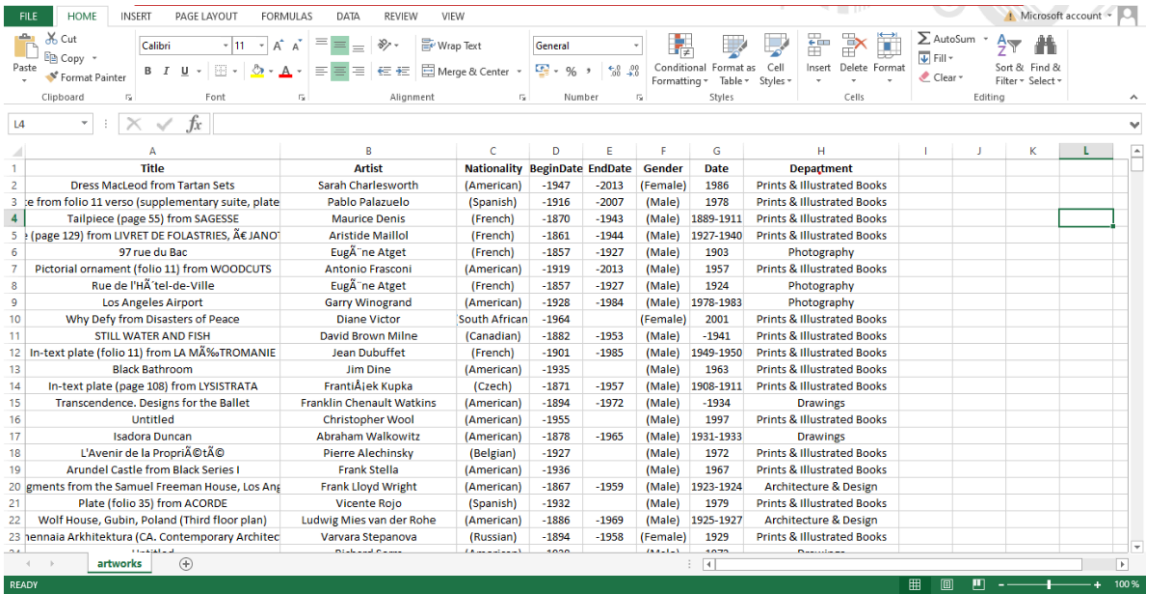
In [2]:
```
1 dataset = list(reader(open('artworks.csv', encoding = 'utf-8')))
```

In [3]:
```
1 header = dataset[0]
2 header
```

Out[3]:
```
['Title',
 'Artist',
 'Nationality',
 'BeginDate',
 'EndDate',
 'Gender',
 'Date',
 'Department']
```

In [4]:
```
1 data = dataset[1:]
2 data
```

Out[4]:
```
[['Dress MacLeod from Tartan Sets',
  'Sarah Charlesworth',
  '(American)',
  '-1947',
  '-2013',
  '(Female)',
  '1986',
  'Prints & Illustrated Books'],
 ['Duplicate of plate from folio 11 verso (supplementary suite, plate 4) from ARDICIA',
  'Pablo Palazuelo',
  '(Spanish)',
  '-1916',
  '-2007',
  '(Male)',
  '1978',
  'Prints & Illustrated Books'],
 ['Tailpiece (page 55) from SAGESSE',
  'Maurice Denis',
```



	Title	Artist	Nationality	BeginDate	EndDate	Gender	Date	Department
2	Dress MacLeod from Tartan Sets	Sarah Charlesworth	(American)	-1947	-2013	(Female)	1986	Prints & Illustrated Books
3	e from folio 11 verso (supplementary suite, plate	Pablo Palazuelo	(Spanish)	-1916	-2007	(Male)	1978	Prints & Illustrated Books
4	Tailpiece (page 55) from SAGESSE	Maurice Denis	(French)	-1870	-1943	(Male)	1889-1911	Prints & Illustrated Books
5	(page 129) from LIVRET DE FOLASTRIES, Ã€ JANO	Aristide Maillol	(French)	-1861	-1944	(Male)	1927-1940	Prints & Illustrated Books
6	97 rue du Bac	EugÃ¨ne Atget	(French)	-1857	-1927	(Male)	1903	Photography
7	Pictorial ornament (folio 11) from WOODCUTS	Antonio Frasconi	(American)	-1919	-2013	(Male)	1957	Prints & Illustrated Books
8	Rue de l'HÃ´tel-de-Ville	EugÃ¨ne Atget	(French)	-1857	-1927	(Male)	1924	Photography
9	Los Angeles Airport	Garry Winogrand	(American)	-1928	-1984	(Male)	1978-1983	Photography
10	Why Defy from Disasters of Peace	Diane Victor	South African	-1964		(Female)	2001	Prints & Illustrated Books
11	STILL WATER AND FISH	David Brown Milne	(Canadian)	-1882	-1953	(Male)	-1941	Prints & Illustrated Books
12	In-text plate (folio 11) from LA MÃ‰TROMANIE	Jean Dubuffet	(French)	-1901	-1985	(Male)	1949-1950	Prints & Illustrated Books
13	Black Bathroom	Jim Dine	(American)	-1935		(Male)	1963	Prints & Illustrated Books
14	In-text plate (page 108) from LYSISTRATA	FrantiÅ¡ek Kupka	(Czech)	-1871	-1957	(Male)	1908-1911	Prints & Illustrated Books
15	Transcendence. Designs for the Ballet	Franklin Chenault Watkins	(American)	-1894	-1972	(Male)	-1934	Drawings
16	Untitled	Christopher Wool	(American)	-1955		(Male)	1997	Prints & Illustrated Books
17	Isadora Duncan	Abraham Walkowitz	(American)	-1878	-1965	(Male)	1931-1933	Drawings
18	L'Avenir de la PropriÃ©tÃ©	Pierre Alechinsky	(Belgian)	-1927		(Male)	1972	Prints & Illustrated Books
19	Arundel Castle from Black Series I	Frank Stella	(American)	-1936		(Male)	1967	Prints & Illustrated Books
20	gments from the Samuel Freeman House, Los Ang	Frank Lloyd Wright	(American)	-1867	-1959	(Male)	1923-1924	Architecture & Design
21	Plate (folio 35) from ACORDE	Vicente Rojo	(Spanish)	-1932		(Male)	1979	Prints & Illustrated Books
22	Wolf House, Gubin, Poland (Third floor plan)	Ludwig Mies van der Rohe	(American)	-1886	-1969	(Male)	1925-1927	Architecture & Design
23	ennaia Arkhitektura (CA. Contemporary Architec	Varvara Stepanova	(Russian)	-1894	-1958	(Female)	1929	Prints & Illustrated Books

Skill Test - 1

- Using python related functions and attributes, clean the Nationality and Gender Columns

In [5]:

```
for i in data:
    i[2] = i[2].replace('(', '').replace(')', '')
    i[5] = i[5].replace('(', '').replace(')', '')
    print(f'{i[2]} --- {i[5]}')
```

```
American --- Female
Spanish --- Male
French --- Male
French --- Male
French --- Male
American --- Male
French --- Male
American --- Male
South African --- Female
Canadian --- Male
French --- Male
American --- Male
Czech --- Male
American --- Male
American --- Male
American --- Male
Belgian --- Male
American --- Male
American --- Male
```

Skill Test - 2

- Clean BeginDate and EndDate Columns

In [6]:
```
for i in data:
    i[3] = i[3].replace('-', '')
    i[4] = i[4].replace('-', '')
    print(f'{i[3]} --- {i[4]}')
```

```
1947 --- 2013
1916 --- 2007
1870 --- 1943
1861 --- 1944
1857 --- 1927
1919 --- 2013
1857 --- 1927
1928 --- 1984
1964 ---
1882 --- 1953
1901 --- 1985
1935 ---
1871 --- 1957
1894 --- 1972
1955 ---
1878 --- 1965
1927 ---
1936 ---
1867 --- 1959
```

Skill Test - 3

- The BeginDate and EndDate are BirthDate and Day of Death for each Artist
- Find out the age of each artist and add it into the dataset

In [7]:
```
header.append('Age')
```

In [8]:
```
for i in data:
    if i[3] and i[4]:
        value = int(i[4]) - int(i[3])
        i.append(value)
    else:
        i.append('Null')
```

Skill Test - 4

- Clean the Date Column excluding the hyphen (-) in between as it specifies a range of date
- Hint: Make sure to find each possible character in the column which makes the data unclean (you can use Excel filtering for that as well)

In [9]:
```
clean = [' ', "'", ',', '.', 'c', 's', '(', ')']
```

In [10]:
```
for i in data:
    if i[6] != "":
        for j in clean:
            i[6] = i[6].replace(j,"")
        print(i[6])
```

```
1986
1978
1889-1911
1927-1940
1903
1957
1924
1978-1983
2001
-1941
1949-1950
1963
1908-1911
-1934
1997
1931-1933
1972
1967
1923-1924
```

startswith()

- It returns True if the string starts with the specified value, otherwise False
- Syntax = string.startswith(value, start, end)

In [11]:
```
'-1947'.startswith('-')
```

Out[11]:
```
True
```

The above method can be used as per your ease in any skill test, if you want to. Using it doesn't award you any special remarks.

Skill Test - 5

- After cleaning the Date Column, split it into two columns IF the date has a starting and ending range else don't split.
- For each date being split, calculate the average date and store it in a new column.

In [12]:
```
for i in data:
    if i[6].startswith('-'):
        i[6] = i[6].replace('-', '')
        print(i[6])
```

```
1941
1934
2003
1926
1916
1919
1965
1966
1926
1970
1911
1952
1960
1966
1989
1923
2004
2003
2003
```

In [13]:
```
for i in data:
    if '-' in i[6]:
        value = i[6].split('-')
        F = int(value[0])
        S = int(value[1])
        add = round((F+S)/2)
        i[6] = add
        print(i[6])
```

```
1900
1934
1980
1950
1910
1932
1924
1926
1925
1989
1924
1972
1948
1924
1992
1968
1966
1934
1958
```

Storing the updated dataset

- Use pandas to save the updated dataset in csv format.
- Name the file as 'Artworks_updated.csv'.
- You can look at previous videos and files to find the code for it.

In [14]:

```
import pandas as pd
d = pd.DataFrame(dataset)
d.to_csv('Artworks_updated.csv', index=False, header=False)
```

Python Project Assignment using Pandas Library

The difficulty of this assignment has been tuned to provide more open ended goal rather than just giving you the task so that you can polish your problem solving skills along with logic building skills.
Best Of Luck!
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Importing the dataset

- Use the csv library to import the artworks dataset

In [27]:
```
import csv
import pandas as pd
```

In [28]:
```
dataset = pd.read_csv('artworks.csv', encoding = 'utf-8')
```

In [29]:
```
dataset.head(3)
```

Out[29]:

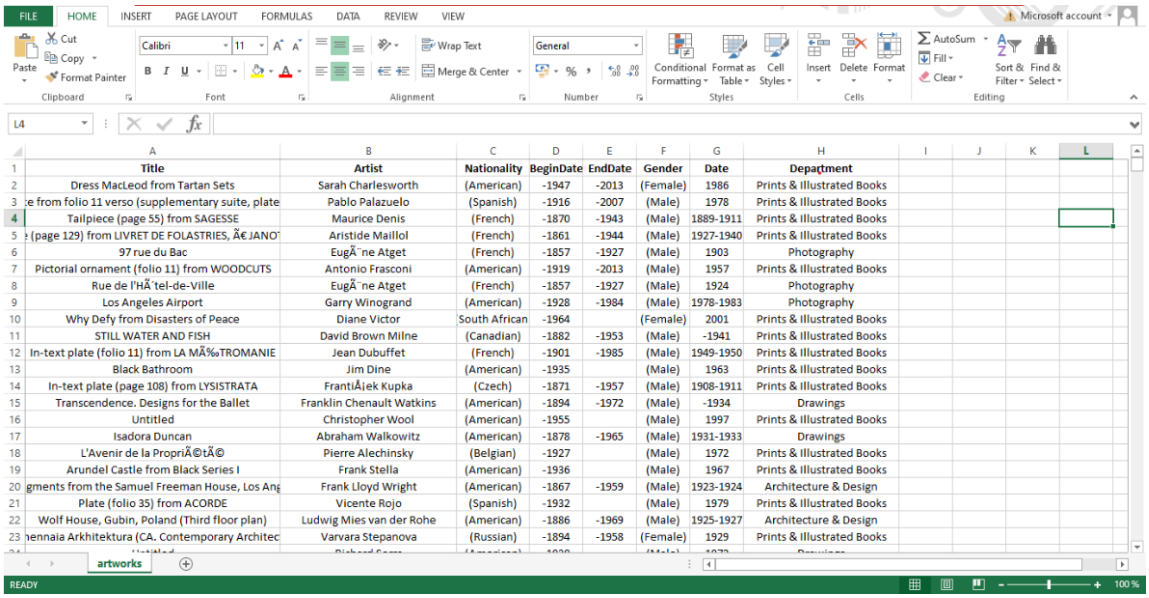
	Title	Artist	Nationality	BeginDate	EndDate	Gender	Date	Department
0	Dress MacLeod from Tartan Sets	Sarah Charlesworth	(American)	-1947.0	-2013.0	(Female)	1986	Prints & Illustrated Books
1	Duplicate of plate from folio 11 verso (supple...	Pablo Palazuelo	(Spanish)	-1916.0	-2007.0	(Male)	1978	Prints & Illustrated Books
2	Tailpiece (page 55) from SAGESSE	Maurice Denis	(French)	-1870.0	-1943.0	(Male)	1889-1911	Prints & Illustrated Books

In [30]:
```
dataset.columns
```

Out[30]:
```
Index(['Title', 'Artist', 'Nationality', 'BeginDate', 'EndDate', 'Gender',
       'Date', 'Department'],
      dtype='object')
```

In [31]:
```
dataset.isnull().sum()
```

Out[31]:
```
Title            1
Artist           0
Nationality      0
BeginDate      942
EndDate       6254
Gender           0
Date             0
Department       0
dtype: int64
```



	Title	Artist	Nationality	BeginDate	EndDate	Gender	Date	Department
2	Dress MacLeod from Tartan Sets	Sarah Charlesworth	(American)	-1947	-2013	(Female)	1986	Prints & Illustrated Books
3	e from folio 11 verso (supplementary suite, plate	Pablo Palazuelo	(Spanish)	-1916	-2007	(Male)	1978	Prints & Illustrated Books
4	Tailpiece (page 55) from SAGESSE	Maurice Denis	(French)	-1870	-1943	(Male)	1889-1911	Prints & Illustrated Books
5	(page 129) from LIVRET DE FOLASTRIES, Ã€ JANO	Aristide Maillol	(French)	-1861	-1944	(Male)	1927-1940	Prints & Illustrated Books
6	97 rue du Bac	EugÃ¨ne Atget	(French)	-1857	-1927	(Male)	1903	Photography
7	Pictorial ornament (folio 11) from WOODCUTS	Antonio Frasconi	(American)	-1919	-2013	(Male)	1957	Prints & Illustrated Books
8	Rue de l'HÃ´tel-de-Ville	EugÃ¨ne Atget	(French)	-1857	-1927	(Male)	1924	Photography
9	Los Angeles Airport	Garry Winogrand	(American)	-1928	-1984	(Male)	1978-1983	Photography
10	Why Defy from Disasters of Peace	Diane Victor	South African	-1964		(Female)	2001	Prints & Illustrated Books
11	STILL WATER AND FISH	David Brown Milne	(Canadian)	-1882	-1953	(Male)	-1941	Prints & Illustrated Books
12	In-text plate (folio 11) from LA MÃ‰TROMANIE	Jean Dubuffet	(French)	-1901	-1985	(Male)	1949-1950	Prints & Illustrated Books
13	Black Bathroom	Jim Dine	(American)	-1935		(Male)	1963	Prints & Illustrated Books
14	In-text plate (page 108) from LYSISTRATA	FrantiÅ¡ek Kupka	(Czech)	-1871	-1957	(Male)	1908-1911	Prints & Illustrated Books
15	Transcendence. Designs for the Ballet	Franklin Chenault Watkins	(American)	-1894	-1972	(Male)	-1934	Drawings
16	Untitled	Christopher Wool	(American)	-1955		(Male)	1997	Prints & Illustrated Books
17	Isadora Duncan	Abraham Walkowitz	(American)	-1878	-1965	(Male)	1931-1933	Drawings
18	L'Avenir de la PropriÃ©tÃ©	Pierre Alechinsky	(Belgian)	-1927		(Male)	1972	Prints & Illustrated Books
19	Arundel Castle from Black Series I	Frank Stella	(American)	-1936		(Male)	1967	Prints & Illustrated Books
20	gments from the Samuel Freeman House, Los Ang	Frank Lloyd Wright	(American)	-1867	-1959	(Male)	1923-1924	Architecture & Design
21	Plate (folio 35) from ACORDE	Vicente Rojo	(Spanish)	-1932		(Male)	1979	Prints & Illustrated Books
22	Wolf House, Gubin, Poland (Third floor plan)	Ludwig Mies van der Rohe	(American)	-1886	-1969	(Male)	1925-1927	Architecture & Design
23	ennaia Arkhitektura (CA. Contemporary Architec	Varvara Stepanova	(Russian)	-1894	-1958	(Female)	1929	Prints & Illustrated Books

Skill Test - 1

- Using python related functions and attributes, clean the Nationality and Gender Columns

In [32]:
```
dataset['Nationality'] = dataset['Nationality'].str.replace('(', '', re
```

In [33]:
```
dataset['Nationality']
```

Out[33]:
```
0         American
1          Spanish
2           French
3           French
4           French
             ...
16724      British
16725      Chilean
16726     American
16727
16728     American
Name: Nationality, Length: 16729, dtype: object
```

In [34]:
```
dataset['Gender'] = dataset['Gender'].str.replace('(', '', regex=False)
```

In [35]:
```
1 dataset['Gender']
```

Out[35]:
```
0        Female
1          Male
2          Male
3          Male
4          Male
          ...
16724      Male
16725      Male
16726      Male
16727
16728      Male
Name: Gender, Length: 16729, dtype: object
```

Skill Test - 2

- Clean BeginDate and EndDate Columns

In [36]:
```
1 dataset['BeginDate'] = dataset['BeginDate'].astype(str).str.replace('-'
```

In [37]:
```
1 # pd.to_numeric = Converts the column to numeric values
2 # error='coerce' = It tells pandas how to handle errors that occur duri
3 dataset['BeginDate'] = pd.to_numeric(dataset['BeginDate'], errors='coer
4 dataset['BeginDate'].head(20)
```

Out[37]:
```
0     1947
1     1916
2     1870
3     1861
4     1857
5     1919
6     1857
7     1928
8     1964
9     1882
10    1901
11    1935
12    1871
13    1894
14    1955
15    1878
16    1927
17    1936
18    1867
19    1932
Name: BeginDate, dtype: Int64
```

In [38]:
```
1 dataset['EndDate'] = dataset['EndDate'].astype(str).str.replace('-','')
```

In [39]:
```
dataset['EndDate'] = pd.to_numeric(dataset['EndDate'], errors='coerce')
dataset['EndDate'].head(20)
```

Out[39]:
```
0     2013
1     2007
2     1943
3     1944
4     1927
5     2013
6     1927
7     1984
8     <NA>
9     1953
10    1985
11    <NA>
12    1957
13    1972
14    <NA>
15    1965
16    <NA>
17    <NA>
18    1959
19    <NA>
Name: EndDate, dtype: Int64
```

Skill Test - 3

- The BeginDate and EndDate are BirthDate and Day of Death for each Artist
- Find out the age of each artist and add it into the dataset

In [40]:
```
dataset['Age'] = dataset['EndDate'] - dataset['BeginDate']
```

In [41]:
```
dataset['Age'] = dataset['Age'].astype(str).str.replace('-', '')
```

In [42]:
```
dataset['Age']
```

Out[42]:
```
0          66
1          91
2          73
3          83
4          70
          ...
16724      88
16725    <NA>
16726      85
16727    <NA>
16728    <NA>
Name: Age, Length: 16729, dtype: object
```

Skill Test - 4

- Clean the Date Column excluding the hyphen (-) in between as it specifies a range of date

Hint: Make sure to find each possible character in the column which makes the data

In [43]:
```
dataset['Date'] = (dataset['Date'].str.replace(' ', '', regex=False).st
```

In [44]:
```
dataset['Date'].head(20)
```

Out[44]:
```
0          1986
1          1978
2     1889-1911
3     1927-1940
4          1903
5          1957
6          1924
7     1978-1983
8          2001
9         -1941
10    1949-1950
11         1963
12    1908-1911
13        -1934
14         1997
15    1931-1933
16         1972
17         1967
18    1923-1924
19         1979
Name: Date, dtype: object
```

startswith()

- It returns True if the string starts with the specified value, otherwise False
- Syntax = string.startswith(value, start, end)

In [45]:
```
'-1947'.startswith('-')
```

Out[45]:
```
True
```

The above method can be used as per your ease in any skill test, if you want to. Using it doesn't award you any special remarks.

Skill Test - 5

- After cleaning the Date Column, split it into two columns IF the date has a starting and ending range else don't split.
- For each date being split, calculate the average date and store it in a new column.

In [46]:
```
def clean_date(value):
    if value.startswith('-'):
        return value.replace('-', '')
    return value
```

In [47]:
```
dataset['Date'] = dataset['Date'].apply(clean_date)
```

In [48]:
```
dataset['Date'].head(20)
```

Out[48]:
```
0          1986
1          1978
2     1889-1911
3     1927-1940
4          1903
5          1957
6          1924
7     1978-1983
8          2001
9          1941
10    1949-1950
11         1963
12    1908-1911
13         1934
14         1997
15    1931-1933
16         1972
17         1967
18    1923-1924
19         1979
Name: Date, dtype: object
```

In [49]:
```
def avg_date(date):
    avg_values = []
    for i in date:
        if '-' in i:
            value = i.split('-')
            F = int(value[0])
            S = int(value[1])
            value = round((F + S) / 2)
            avg_values.append(value)
        else:
            avg_values.append(i)
    return avg_values
```

In [50]:
```
dataset['Avg_date'] = avg_date(dataset['Date'])
```

In [51]:
```
1 dataset['Avg_date'].head(20)
```

Out[51]:
```
0     1986
1     1978
2     1900
3     1934
4     1903
5     1957
6     1924
7     1980
8     2001
9     1941
10    1950
11    1963
12    1910
13    1934
14    1997
15    1932
16    1972
17    1967
18    1924
19    1979
Name: Avg_date, dtype: object
```

Storing the updated dataset

- Use pandas to save the updated dataset in csv format.
- Name the file as 'Artworks_updated.csv'.
- You can look at previous videos and files to find the code for it.

In [52]:

```
1 dataset.head(20)
```

Out[52]:

	Title	Artist	Nationality	BeginDate	EndDate	Gender	Date	Department
0	Dress MacLeod from Tartan Sets	Sarah Charlesworth	American	1947	2013	Female	1986	Prints & Illustrated Books
1	Duplicate of plate from folio 11 verso (supple...	Pablo Palazuelo	Spanish	1916	2007	Male	1978	Prints & Illustrated Books
2	Tailpiece (page 55) from SAGESSE	Maurice Denis	French	1870	1943	Male	1889-1911	Prints & Illustrated Books
3	Headpiece (page 129) from LIVRET DE FOLASTRIES...	Aristide Maillol	French	1861	1944	Male	1927-1940	Prints & Illustrated Books
4	97 rue du Bac	Eugène Atget	French	1857	1927	Male	1903	Photography
5	Pictorial ornament (folio 11) from WOODCUTS	Antonio Frasconi	American	1919	2013	Male	1957	Prints & Illustrated Books
6	Rue de l'Hôtel-de-Ville	Eugène Atget	French	1857	1927	Male	1924	Photography
7	Los Angeles Airport	Garry Winogrand	American	1928	1984	Male	1978-1983	Photography
8	Why Defy from Disasters of Peace	Diane Victor	South African	1964	<NA>	Female	2001	Prints & Illustrated Books
9	STILL WATER AND FISH	David Brown Milne	Canadian	1882	1953	Male	1941	Prints & Illustrated Books
10	In-text plate (folio 11) from LA MÉTROMANIE	Jean Dubuffet	French	1901	1985	Male	1949-1950	Prints & Illustrated Books
11	Black Bathroom	Jim Dine	American	1935	<NA>	Male	1963	Prints & Illustrated Books
12	In-text plate (page 108) from LYSISTRATA	František Kupka	Czech	1871	1957	Male	1908-1911	Prints & Illustrated Books
13	Transcendence. Designs for the Ballet	Franklin Chenault Watkins	American	1894	1972	Male	1934	Drawings
14	Untitled	Christopher Wool	American	1955	<NA>	Male	1997	Prints & Illustrated Books
15	Isadora Duncan	Abraham Walkowitz	American	1878	1965	Male	1931-1933	Drawings
16	L'Avenir de la Propriété	Pierre Alechinsky	Belgian	1927	<NA>	Male	1972	Prints & Illustrated Books
17	Arundel Castle from Black Series I	Frank Stella	American	1936	<NA>	Male	1967	Prints & Illustrated Books

	Title	Artist	Nationality	BeginDate	EndDate	Gender	Date	Department
18	Block fragments from the Samuel Freeman House,...	Frank Lloyd Wright	American	1867	1959	Male	1923-1924	Architecture & Design
19	Plate (folio 35) from ACORDE	Vicente Rojo	Spanish	1932	<NA>	Male	1979	Prints & Illustrated Books

In [53]:
```
1 dataset.to_csv( 'Artworks_updated.csv', index=False)
```