

# assignment1

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## 1 Assignment 1

Name: Chen, Kun

ID: 8977010

## 2 Task 1

### 2.1 0. Import Libarey

```
[2]: import numpy as np
import pandas as pd
```

### 2.2 1. Load Dataset

```
[3]: data = pd.read_csv('Assignment1Data_Sample.csv')
data
```

```
[3]:
```

	Object Number	Object ID	Department \
0	62.16	1674	American Decorative Arts
1	13.7.17	2430	American Decorative Arts
2	33.85.11	6406	American Decorative Arts
3	69.194.109	7616	American Decorative Arts
4	2006.235.20	15012	American Decorative Arts
..	...	...	...
199	63.350.329.701-1.16	779306	Drawings and Prints
200	63.350.244.87.182	785013	Drawings and Prints
201	1980.1119(1)	813925	Drawings and Prints
202	1986.1180.249	820618	Drawings and Prints
203	67.744.50	824428	Drawings and Prints

  

	Object Name	Title \
0	Side Chair	Side Chair
1	Pitcher	Covered Pitcher
2	Plate	Plate
3	Soup bowl	Soup Bowl
4	Painting, miniature	Portrait of a Lady
..	...	...

199	Trade card	Packard-Tourist, from the "Antique Autos" seri...
200	Print; ephemera	Norwegian Air Force In Canada Patrol Bomber (N...
201	Print	Stonehenge
202	Print	Psyche, holding the flask of beauty being tran...
203	Print	Landscape and Cattle

	Culture	Period	Dynasty	Reign		Portfolio	...	\
0	American	NaN	NaN	NaN		NaN	...	
1	American	NaN	NaN	NaN		NaN	...	
2	Dutch	NaN	NaN	NaN		NaN	...	
3	American	NaN	NaN	NaN		NaN	...	
4	American	NaN	NaN	NaN		NaN	...	
..	...	...	...	...		...	...	
199	NaN	NaN	NaN	NaN		NaN	...	
200	NaN	NaN	NaN	NaN		NaN	...	
201	NaN	NaN	NaN	NaN	Ruins and Landscapes	NaN	...	
202	NaN	NaN	NaN	NaN		NaN	...	
203	NaN	NaN	NaN	NaN	New York and Long Island Landscapes	NaN	...	

	Locale	Locus	Excavation	River	Classification	Rights	and	Reproduction	\
0	NaN	NaN	NaN	NaN	Furniture			NaN	
1	NaN	NaN	NaN	NaN	Ceramics			NaN	
2	NaN	NaN	NaN	NaN	Ceramics			NaN	
3	NaN	NaN	NaN	NaN	Ceramics			NaN	
4	NaN	NaN	NaN	NaN	Paintings			NaN	
..	...	...	...	...	...	...		NaN	
199	NaN	NaN	NaN	NaN	Prints Ephemera			NaN	
200	NaN	NaN	NaN	NaN	Prints Ephemera			NaN	
201	NaN	NaN	NaN	NaN	Prints	© Philip Pearlstein		NaN	
202	NaN	NaN	NaN	NaN	Prints			NaN	
203	NaN	NaN	NaN	NaN	Prints			NaN	

	Link	Resource	Metadata	Date	\
0	http://www.metmuseum.org/art/collection/search...		5/13/2019	8:00	
1	http://www.metmuseum.org/art/collection/search...		5/13/2019	8:00	
2	http://www.metmuseum.org/art/collection/search...		5/13/2019	8:00	
3	http://www.metmuseum.org/art/collection/search...		5/13/2019	8:00	
4	http://www.metmuseum.org/art/collection/search...		5/13/2019	8:00	
..	...		...	...	
199	http://www.metmuseum.org/art/collection/search...		5/13/2019	8:00	
200	http://www.metmuseum.org/art/collection/search...		5/13/2019	8:00	
201	http://www.metmuseum.org/art/collection/search...		5/13/2019	8:00	
202	http://www.metmuseum.org/art/collection/search...		5/13/2019	8:00	
203	http://www.metmuseum.org/art/collection/search...		5/13/2019	8:00	

	Repository	Tags
0	Metropolitan Museum of Art, New York, NY	Chairs

```

1    Metropolitan Museum of Art, New York, NY    Pitchers
2    Metropolitan Museum of Art, New York, NY    NaN
3    Metropolitan Museum of Art, New York, NY    Bowls
4    Metropolitan Museum of Art, New York, NY    Pendants|Portraits|Women
..
199  Metropolitan Museum of Art, New York, NY    NaN
200  Metropolitan Museum of Art, New York, NY    NaN
201  Metropolitan Museum of Art, New York, NY    NaN
202  Metropolitan Museum of Art, New York, NY    Adam|Eve
203  Metropolitan Museum of Art, New York, NY    NaN

```

[204 rows x 41 columns]

```
[4]: data.info()
```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 204 entries, 0 to 203
Data columns (total 41 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   Object Number                        204 non-null   object
1   Object ID                           204 non-null   int64
2   Department                          203 non-null   object
3   Object Name                         203 non-null   object
4   Title                              194 non-null   object
5   Culture                             84 non-null   object
6   Period                              31 non-null   object
7   Dynasty                             9 non-null    object
8   Reign                               5 non-null    object
9   Portfolio                           8 non-null    object
10  Artist Role                         127 non-null   object
11  Artist Prefix                       39 non-null   object
12  Artist Display Name                 127 non-null   object
13  Artist Display Bio                 108 non-null   object
14  Artist Suffix                       5 non-null    object
15  Artist Nationality                 87 non-null   object
16  Artist Begin Date                  98 non-null   object
17  Artist End Date                    97 non-null   object
18  Object Date                        199 non-null   object
19  Object Begin Date                  204 non-null   int64
20  Object End Date                    202 non-null   float64
21  Medium                             202 non-null   object
22  Dimensions                         166 non-null   object
23  Credit Line                        204 non-null   object
24  Geography Type                     23 non-null   object
25  City                               14 non-null   object
26  State                              1 non-null    object

```

27	County	3 non-null	object
28	Country	32 non-null	object
29	Region	18 non-null	object
30	Subregion	12 non-null	object
31	Locale	7 non-null	object
32	Locus	4 non-null	object
33	Excavation	7 non-null	object
34	River	2 non-null	object
35	Classification	173 non-null	object
36	Rights and Reproduction	7 non-null	object
37	Link Resource	204 non-null	object
38	Metadata Date	204 non-null	object
39	Repository	204 non-null	object
40	Tags	111 non-null	object

dtypes: float64(1), int64(2), object(38)  
memory usage: 65.5+ KB

## 2.3 2 Data Cleanning

### 2.3.1 2.1 Remove Useless Columns

```
[5]: required_columns = ['Object ID', 'Department', 'Object Name', 'Title',
    ↪ 'Culture', 'Artist Nationality', 'Object Begin Date', 'Object End Date',
    ↪ 'Medium', 'Credit Line', 'Country']
remove_columns = list(set(list(data.columns)).difference(set(required_columns)))
remove_columns
```

```
[5]: ['Dimensions',
    'Dynasty',
    'Geography Type',
    'Metadata Date',
    'Object Number',
    'Region',
    'Artist Role',
    'Link Resource',
    'Locus',
    'Artist Display Name',
    'Excavation',
    'Portfolio',
    'Period',
    'Artist Begin Date',
    'Artist End Date',
    'County',
    'City',
    'Artist Suffix',
    'Rights and Reproduction',
    'Locale',
    'Subregion',
```

```
'Artist Display Bio',
'Classification',
'State',
'Object Date',
'Tags',
'Repository',
'Reign',
'Artist Prefix',
'River']
```

```
[6]: data = data.drop(remove_columns, axis=1)
data
```

```
[6]:
```

	Object ID	Department	Object Name \
0	1674	American Decorative Arts	Side Chair
1	2430	American Decorative Arts	Pitcher
2	6406	American Decorative Arts	Plate
3	7616	American Decorative Arts	Soup bowl
4	15012	American Decorative Arts	Painting, miniature
..	...	...	...
199	779306	Drawings and Prints	Trade card
200	785013	Drawings and Prints	Print; ephemera
201	813925	Drawings and Prints	Print
202	820618	Drawings and Prints	Print
203	824428	Drawings and Prints	Print

  

	Title	Culture \
0	Side Chair	American
1	Covered Pitcher	American
2	Plate	Dutch
3	Soup Bowl	American
4	Portrait of a Lady	American
..	...	...
199	Packard-Tourist, from the "Antique Autos" seri...	NaN
200	Norwegian Air Force In Canada Patrol Bomber (N...	NaN
201	Stonehenge	NaN
202	Psyche, holding the flask of beauty being tran...	NaN
203	Landscape and Cattle	NaN

  

	Artist Nationality	Object Begin Date	Object End Date \
0	NaN	1794	1799.0
1	NaN	1700	1900.0
2	NaN	1740	1760.0
3	NaN	1885	1885.0
4	NaN	1840	1840.0
..	...	...	...
199	NaN	1953	1953.0

200	NaN	1942	1942.0
201	NaN	1979	1979.0
202	NaN	1525	1535.0
203	NaN	1875	1885.0

		Medium \	
0	Mahogany, ebony, ash, birch, white pine		
1		Earthenware	
2		Earthenware	
3		Porcelain	
4		Watercolor on ivory	
..		...	
199		Commercial color lithograph	
200		Commercial color lithograph	
201	Sugar-lift aquatint with roulette		
202		Engraving	
203		Etching	

		Credit Line	Country
0		Friends of the American Wing Fund, 1962	United States
1		Rogers Fund, 1913	United States
2		Rogers Fund, 1933	Netherlands
3	Gift of Mr. and Mrs. Franklin Chace, 1969		United States
4		Fletcher Fund, 2006	NaN
..		...	...
199	The Jefferson R. Burdick Collection, Gift of J...		NaN
200	The Jefferson R. Burdick Collection, Gift of J...		NaN
201		Gift of Jerry S. Flum, 1980	NaN
202		Bequest of Grace Pugh, 1985	NaN
203		Gift of Henry Levien, 1967	NaN

[204 rows x 11 columns]

### 2.3.2 2.2 Fill the Null

```
[7]: data.isna().any().any() and data.isnull().any()
```

```
[7]: Object ID      False
      Department    True
      Object Name    True
      Title          True
      Culture        True
      Artist Nationality True
      Object Begin Date False
      Object End Date  True
      Medium         True
      Credit Line     False
```

```
Country          True
dtype: bool
```

```
[8]: data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 204 entries, 0 to 203
Data columns (total 11 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Object ID             204 non-null   int64
1   Department            203 non-null   object
2   Object Name           203 non-null   object
3   Title                 194 non-null   object
4   Culture               84 non-null    object
5   Artist Nationality    87 non-null    object
6   Object Begin Date     204 non-null   int64
7   Object End Date       202 non-null   float64
8   Medium               202 non-null   object
9   Credit Line           204 non-null   object
10  Country               32 non-null    object
dtypes: float64(1), int64(2), object(8)
memory usage: 17.7+ KB
```

```
[9]: data[data.isnull().T.any()]
```

```
[9]:
```

	Object ID	Department	Object Name \
0	1674	American Decorative Arts	Side Chair
1	2430	American Decorative Arts	Pitcher
2	6406	American Decorative Arts	Plate
3	7616	American Decorative Arts	Soup bowl
4	15012	American Decorative Arts	Painting, miniature
..	...	...	...
199	779306	Drawings and Prints	Trade card
200	785013	Drawings and Prints	Print; ephemera
201	813925	Drawings and Prints	Print
202	820618	Drawings and Prints	Print
203	824428	Drawings and Prints	Print

  

	Title	Culture \
0	Side Chair	American
1	Covered Pitcher	American
2	Plate	Dutch
3	Soup Bowl	American
4	Portrait of a Lady	American
..	...	...
199	Packard-Tourist, from the "Antique Autos" seri...	NaN

200	Norwegian Air Force In Canada Patrol Bomber (N...	NaN
201	Stonehenge	NaN
202	Psyche, holding the flask of beauty being tran...	NaN
203	Landscape and Cattle	NaN

	Artist Nationality	Object Begin Date	Object End Date \
0	NaN	1794	1799.0
1	NaN	1700	1900.0
2	NaN	1740	1760.0
3	NaN	1885	1885.0
4	NaN	1840	1840.0
..	...	...	...
199	NaN	1953	1953.0
200	NaN	1942	1942.0
201	NaN	1979	1979.0
202	NaN	1525	1535.0
203	NaN	1875	1885.0

	Medium \
0	Mahogany, ebony, ash, birch, white pine
1	Earthenware
2	Earthenware
3	Porcelain
4	Watercolor on ivory
..	...
199	Commercial color lithograph
200	Commercial color lithograph
201	Sugar-lift aquatint with roulette
202	Engraving
203	Etching

	Credit Line	Country
0	Friends of the American Wing Fund, 1962	United States
1	Rogers Fund, 1913	United States
2	Rogers Fund, 1933	Netherlands
3	Gift of Mr. and Mrs. Franklin Chace, 1969	United States
4	Fletcher Fund, 2006	NaN
..	...	...
199	The Jefferson R. Burdick Collection, Gift of J...	NaN
200	The Jefferson R. Burdick Collection, Gift of J...	NaN
201	Gift of Jerry S. Flum, 1980	NaN
202	Bequest of Grace Pugh, 1985	NaN
203	Gift of Henry Levien, 1967	NaN

[204 rows x 11 columns]



```
[10]: data['Department'] = data['Department'].fillna('Unknown Department')
data['Object Name'] = data['Object Name'].fillna('Untitled Object')
data['Title'] = data['Title'].fillna('Untitled')
data['Culture'] = data['Culture'].fillna('Unknown Culture')
data['Artist Nationality'] = data['Artist Nationality'].fillna('Unknown_
↳Nationality')
data['Object End Date'] = data['Object End Date'].fillna(data['Object Begin_
↳Date'])
data['Medium'] = data['Medium'].fillna('Unknown Medium')
data['Country'] = data['Country'].fillna('Unknown Country')
```

```
[11]: data
```

```
[11]:
```

	Object ID	Department	Object Name \
0	1674	American Decorative Arts	Side Chair
1	2430	American Decorative Arts	Pitcher
2	6406	American Decorative Arts	Plate
3	7616	American Decorative Arts	Soup bowl
4	15012	American Decorative Arts	Painting, miniature
..	...	...	...
199	779306	Drawings and Prints	Trade card
200	785013	Drawings and Prints	Print; ephemera
201	813925	Drawings and Prints	Print
202	820618	Drawings and Prints	Print
203	824428	Drawings and Prints	Print

  

	Title	Culture \
0	Side Chair	American
1	Covered Pitcher	American
2	Plate	Dutch
3	Soup Bowl	American
4	Portrait of a Lady	American
..	...	...
199	Packard-Tourist, from the "Antique Autos" seri...	Unknown Culture
200	Norwegian Air Force In Canada Patrol Bomber (N...	Unknown Culture
201	Stonehenge	Unknown Culture
202	Psyche, holding the flask of beauty being tran...	Unknown Culture
203	Landscape and Cattle	Unknown Culture

  

	Artist Nationality	Object Begin Date	Object End Date \
0	Unknown Nationality	1794	1799.0
1	Unknown Nationality	1700	1900.0
2	Unknown Nationality	1740	1760.0
3	Unknown Nationality	1885	1885.0
4	Unknown Nationality	1840	1840.0
..	...	...	...
199	Unknown Nationality	1953	1953.0

200	Unknown Nationality	1942	1942.0
201	Unknown Nationality	1979	1979.0
202	Unknown Nationality	1525	1535.0
203	Unknown Nationality	1875	1885.0

	Medium \
0	Mahogany, ebony, ash, birch, white pine
1	Earthenware
2	Earthenware
3	Porcelain
4	Watercolor on ivory
..	...
199	Commercial color lithograph
200	Commercial color lithograph
201	Sugar-lift aquatint with roulette
202	Engraving
203	Etching

	Credit Line	Country
0	Friends of the American Wing Fund, 1962	United States
1	Rogers Fund, 1913	United States
2	Rogers Fund, 1933	Netherlands
3	Gift of Mr. and Mrs. Franklin Chace, 1969	United States
4	Fletcher Fund, 2006	Unknown Country
..	...	...
199	The Jefferson R. Burdick Collection, Gift of J...	Unknown Country
200	The Jefferson R. Burdick Collection, Gift of J...	Unknown Country
201	Gift of Jerry S. Flum, 1980	Unknown Country
202	Bequest of Grace Pugh, 1985	Unknown Country
203	Gift of Henry Levien, 1967	Unknown Country

[204 rows x 11 columns]

### 2.3.3 2.3 Drop Duplicates

```
[12]: data[data['Object ID'].duplicated(keep=False)]
```

```
[12]:
```

	Object ID	Department	Object Name \
30	100359	Costume Institute	Hat
31	100359	Costume Institute	Hat
74	316760	Arts of Africa, Oceania, and the Americas	Painting
75	316760	Arts of Africa, Oceania, and the Americas	Painting
138	486599	Modern and Contemporary Art	Bowl
139	486599	Modern and Contemporary Art	Bowl
147	563318	Egyptian Art	Jar Label
148	563318	Egyptian Art	Jar Label

	Title	Culture	Artist Nationality \
30	Hat	French	French French
31	Hat	French	French French
74	Painting	Abelam people	Unknown Nationality
75	Painting	Abelam people	Unknown Nationality
138	"Tard la Nuit" Bowl	Unknown Culture	Italian
139	"Tard la Nuit" Bowl	Unknown Culture	Italian
147	Jar label fragments	Unknown Culture	Unknown Nationality
148	Jar label fragments	Unknown Culture	Unknown Nationality

	Object Begin Date	Object End Date	Medium \
30	1949	1949.0	wool, cotton
31	1949	1949.0	wool, cotton
74	1900	2000.0	Paper, paint
75	1900	2000.0	Paper, paint
138	1989	1989.0	Glass
139	1989	1989.0	Glass
147	-1390	-1390.0	Pottery and ink, paint
148	-1390	-1390.0	Pottery and ink, paint

	Credit Line	Country
30	Gift of Mary S. Ryan, 1981	Unknown Country
31	Gift of Mary S. Ryan, 1981	Unknown Country
74	Gift of Lita Osmundsen, 1992	Papua New Guinea
75	Gift of Lita Osmundsen, 1992	Papua New Guinea
138	Gift of Peter T. Joseph, 1995	Unknown Country
139	Gift of Peter T. Joseph, 1995	Unknown Country
147	Rogers Fund, 1917	Egypt
148	Rogers Fund, 1917	Egypt

```
[13]: data = data.drop_duplicates()
data
```

```
[13]:
```

	Object ID	Department	Object Name \
0	1674	American Decorative Arts	Side Chair
1	2430	American Decorative Arts	Pitcher
2	6406	American Decorative Arts	Plate
3	7616	American Decorative Arts	Soup bowl
4	15012	American Decorative Arts	Painting, miniature
..	...	...	...
199	779306	Drawings and Prints	Trade card
200	785013	Drawings and Prints	Print; ephemera
201	813925	Drawings and Prints	Print
202	820618	Drawings and Prints	Print
203	824428	Drawings and Prints	Print

Title	Culture \
-------	-----------

0	Side Chair	American
1	Covered Pitcher	American
2	Plate	Dutch
3	Soup Bowl	American
4	Portrait of a Lady	American
..	...	...
199	Packard-Tourist, from the "Antique Autos" seri...	Unknown Culture
200	Norwegian Air Force In Canada Patrol Bomber (N...	Unknown Culture
201	Stonehenge	Unknown Culture
202	Psyche, holding the flask of beauty being tran...	Unknown Culture
203	Landscape and Cattle	Unknown Culture

	Artist Nationality	Object Begin Date	Object End Date \
0	Unknown Nationality	1794	1799.0
1	Unknown Nationality	1700	1900.0
2	Unknown Nationality	1740	1760.0
3	Unknown Nationality	1885	1885.0
4	Unknown Nationality	1840	1840.0
..	...	...	...
199	Unknown Nationality	1953	1953.0
200	Unknown Nationality	1942	1942.0
201	Unknown Nationality	1979	1979.0
202	Unknown Nationality	1525	1535.0
203	Unknown Nationality	1875	1885.0

	Medium \
0	Mahogany, ebony, ash, birch, white pine
1	Earthenware
2	Earthenware
3	Porcelain
4	Watercolor on ivory
..	...
199	Commercial color lithograph
200	Commercial color lithograph
201	Sugar-lift aquatint with roulette
202	Engraving
203	Etching

	Credit Line	Country
0	Friends of the American Wing Fund, 1962	United States
1	Rogers Fund, 1913	United States
2	Rogers Fund, 1933	Netherlands
3	Gift of Mr. and Mrs. Franklin Chace, 1969	United States
4	Fletcher Fund, 2006	Unknown Country
..	...	...
199	The Jefferson R. Burdick Collection, Gift of J...	Unknown Country
200	The Jefferson R. Burdick Collection, Gift of J...	Unknown Country

201	Gift of Jerry S. Flum, 1980	Unknown Country
202	Bequest of Grace Pugh, 1985	Unknown Country
203	Gift of Henry Levien, 1967	Unknown Country

[200 rows x 11 columns]

```
[14]: for column in data.columns[1:]:
        unique_values = data[column].unique()
        print(f"Column: {column}")
        for value in unique_values:
            print(' ',value)
        print("\n")
```

Column: Department

American Decorative Arts  
 Arms and Armor  
 Asian Art  
 Costume Institute  
 European Sculpture and Decorative Arts  
 Greek and Roman Art  
 Photographs  
 Arts of Africa, Oceania, and the Americas  
 Unknown Department  
 Ancient Near Eastern Art  
 Drawings and Prints  
 Islamic Art  
 Robert Lehman Collection  
 Medieval Art  
 The Cloisters  
 Modern and Contemporary Art  
 Egyptian Art

Column: Object Name

Side Chair  
 Pitcher  
 Plate  
 Soup bowl  
 Painting, miniature  
 Arrowhead (Yanonē)  
 Knife handle (Kozuka)  
 Coin (Thaler)  
 Two drawings  
 Partisan  
 Sword guard (Tsuba)  
 Dirk with sheath  
 Hanging scroll mounted as handscroll

Girdle ornament  
Bracelet  
Print  
Album leaf  
Inrō  
Basket  
Piece  
Hanging scroll  
Drawing  
Belt  
Pumps  
Evening dress  
Shoes  
Earrings  
Cap  
Hat  
Mules  
Gloves  
Ensemble  
Necklace  
Jacket  
Chemisette  
Fan  
Undersleeves  
Evening shoes  
Knife and fork with case  
Swags  
Jug with cover  
Plaque  
Snuffbox  
Chess set  
Toy  
Souvenir spoon  
Border  
Fragment  
Borders  
Panel  
Statuette of a seated goddess  
Axehead  
Fibula, boat-shaped type  
Statuette of a woman, seated  
Seal  
Photograph  
Glass positive  
Negative  
Horn  
Snake figure  
Pendant

Painting  
Cloth  
Ritual stone  
Costume element  
Sherd  
Sculpture  
Bead  
Print; Poster  
Book  
Drawing Ornament & Architecture  
Drawing ; Ornament and architecture  
Baseball card  
Baseball card, print  
Dado panel  
Folio from an illustrated manuscript  
Hilt  
Capital  
Roundel  
Glass  
Design  
Bowl  
Figurine, female, fragmentary  
Ostrakon, hieratic  
Figurine, seated woman  
Beaker, white cross-lined ware  
Club  
Basket, coil, lid  
Jar Label  
Jar Label, meat  
Relief fragment  
Linen, from Wah's Mummy  
Print, baseball card  
Untitled Object  
Books Prints Ornament & Architecture  
Photograph; Photomicrograph  
Album  
Kylix fragment  
Prints Ornament & Architecture  
Column-krater fragment  
Ephemera  
Oinochoe fragment  
Book Print Ornament & Architecture  
Skyphos fragment  
Print, baseball  
Vase  
Dish  
Trade card  
Print; ephemera

Column: Title

Side Chair  
Covered Pitcher  
Plate  
Soup Bowl  
Portrait of a Lady  
Arrowhead (Yanonē)  
Knife Handle (Kozuka)  
Coin (Thaler) Showing August I (The Pious) of Saxony  
Drawings Showing Combat on Foot (Champ Clos)  
Partisan  
Sword Guard (Tsuba)  
Dirk with Sheath  
Untitled  
|Bamboo and Cicada  
Belt  
Pumps  
Evening dress  
Shoes  
Earrings  
Cap  
Hat  
Mules  
Gloves  
Ensemble  
Necklace  
Jacket  
Chemisette  
Fan  
Undersleeves  
Evening shoes  
Knife and fork with case  
Set of five swags  
Jug with cover  
Marriage of Peleus and Thetis  
Snuffbox  
Chess set  
Partridges in wheatsheaf  
Souvenir spoon  
Border  
Fragment  
Borders  
Panel  
Head described as that of Saint James the Elder  
Terracotta statuette of a seated goddess  
Axehead



Fibula, boat-shaped type  
 Terracotta statuette of a seated woman  
 Jasper amygdaloid seal  
 Seal  
 [Detail of Vanitas Figures Carved on the Choir Stalls at Amiens Cathedral]  
 Robert Motherwell  
 [Graffiti on Backstage Door of the School of American Ballet]  
 [Study of Australian Grapes]  
 Sous bois  
 Margaret Eakins  
 [Peggy Bacon]  
 [Two 35mm Film Frames: Boys Playing on Stoop Near Elevated Train Tracks, New York City]  
 Rouen, Place Eau-de-Robec  
 Horn  
 Coiled Serpent  
 Figure Pendant  
 Painting  
 Carrying Cloth  
 Stone Pulidor  
 Ceremonial Costume Element  
 Sherd  
 Bird standard  
 Bead  
 New York Ledger: Bicycle Number  
 Figure Studies  
 Reciprocated Love  
 Rest on the flight into Egypt, Mary holding and looking at the infant Christ while St. Joseph reads  
 Meubles Modernes  
 Blossoms of Childhood  
 The Comical History of Lord Flutter, Lord Spindle and Sir Harry Hopscotch; or, the Bee, the Wasp, and the Ant  
 Seamless Plain Solid Gold Rings, Engraved Rings, Diamond Rings, Mountings, Ladies' Stone Rings, Chains, Diamond Cutters  
 Performing Tea Ceremony, The Miyako Odori for 1935, and eight stage sets  
 Plates in Missel de Notre-Dame de France  
 Exposition Lorraine. L'École de Nancy au Musée de l'Union Centrale des Arts Décoratifs. Pavillon de Marsan, A Paris. Ier Série: Le Moblier  
 Enoch Arden  
 St. Peter's, exterior, tabernacle, elevation and section at base with details of pedestal and railing, (recto) St. Peter's, exterior, tabernacle, elevation and section at arched opening (verso)  
 Head of a muscular old man in profile to left with flowing hair  
 View of the Basilica of San Sebastiano fuori delle mura [St. Sebastian outside the Walls] on the Appian Way, from Vedute di Roma (Roman Views)  
 Design for Pointed Utensil with an Egyptian Style Figure on the Handle  
 Saint Paul

Francis W. Little House: Furniture Plan  
Theodoric IV from the series Counts and Countesses of Holland, Zeeland, and West-Frisia  
L'Art de bâtir des maisons de Campagne  
Design for Vis-à-vis, no. 3223  
Design for Pony Phaeton, no. 3162  
Ceiling Design, Half of a Circle  
Canal with an Angler and Two Swans  
GERYON  
Syzygy or the Conjunction of the Macrocosmic Unity with the Microcosmic  
Triunity from Heinrich Khunrath, Amphiteatrum sapientiae aeternae  
Horse Group #17  
Whither Mankind  
The dream of St Joseph, who is sleeping at the right, the Virgin and Child by a cross surrounded by angels and many putti and with God the Father above  
Sullivan, Left Field, Chicago, from the Gold Coin series (N284) for Gold Coin  
Chewing Tobacco  
Section and elevation of the Colosseum in Rome  
Chairing the Members, Plate IV: Four Prints of an Election  
George Bubear, Oarsman, from World's Champions, Series 1 (N28) for Allen & Ginter Cigarettes  
Louis Chiozza; verso: Diamond Stars, No. 80 (1934 Averages)  
Prise de la Ville de Bone (Capture of the City of Bonne), from La Vie de Ferdinand Ier de Médicis série appelée aussi Les Batailles des Médicis (The Life of Ferdinand I de'Medici also called The Medici Battles)  
The Impossibility  
S. Antioche, médecin (St. Antiochus, Doctor), July 15th, from Les Images De Tous Les Saints et Saintes de L'Année (Images of All of the Saints and Religious Events of the Year)  
Sea-Bass Fisherman  
Reverse Copy of Madame Bouthillier (Marie de Bragelogne)  
Reconnoitering, from the Boy Scouts series (E42) for the Fisher Candy Co.  
Vues de St. Petersburg  
Fitzgerald, Sacramento, Pacific Coast League, from the "Obak Baseball Players" set (T212), issued by the American Tobacco Company to promote Obak Mouthpiece Cigarettes  
Spencer, Catcher, Boston, American League, from the Baseball Players (Ramlys) series (T204) issued by the Mentor Company to promote Ramly and T.T.T. Turkish Cigarettes  
Fragment of a Bowl  
Dado Panel  
"Yusuf and Zulaikha", Folio 51r from a Bustan of Sa'di  
Head of a Man in Profile  
Glass Fragment  
Eagle-Headed Hilt  
Grisaille Panel  
Capital  
Roundel with Saint John the Baptist

Glass  
 Design for a Washstand for the Blue Bedroom, Hous'hill  
 "Tard la Nuit" Bowl  
 Alvin Langdon Coburn  
 Upper Half of a Female Figurine  
 Hieratic ostrakon  
 Figurine of a Seated Woman  
 White cross-lined ware beaker decorated with zigzags  
 Club  
 Cylindrical Coil Basket with Lid  
 Jar label fragments  
 Jar Label  
 Relief fragment  
 Linen, from Wah's Mummy  
 Discover Dry Dock Country: Madison Avenue between 63rd and 65th  
 St. Agatha, from 'Di Tutti gli Affresco del Correggio e di Quattro del  
 Parmigianino'  
 Walter Switzer, Cornell Quarterback shown being grounded by three Columbia  
 Players, from the "Baseball and Football" set (R311), issued by the National  
 Chiclé Company to promote Diamond Stars Gum  
 The Virgin and Child with St. John the Baptist, St. Francis, and St.  
 Catherine of Siena  
 Card Number 28, Harry "The Cat" Brecheen, Pitcher, St. Louis Cardinals, from  
 the Topps Red/ Blue Backs series (R414-5) issued by Topps Chewing Gum Company  
 Card No. 145, U.S. Luscombe "Silvaire," from the Aviation Gum series (V356),  
 issued by World Wide Gum Company, Ltd.  
 Officer Gordon F. Wilson Shows Mug Pictures to a Woman  
 Card Number 22, Jim Greengrass, Outfield, Cincinnati Redlegs, from "1954  
 Topps Regular Issue" series (R414-8), issued by Topps Chewing Gum Company.  
 Mary, Queen of Scots at the execution block (from The History of England)  
 Happy Easter (Frohe Ostern)  
 Portrait, bust-length, with bow  
 Stripper with bare breasts sitting in her dressing room, Atlantic City, N.J.  
 Virginia Hurned, from the Actresses series (N245) issued by Kinney Brothers  
 to promote Sweet Caporal Cigarettes  
 New York City 2[unfinished, formerly New York City III]  
 The woodcutter  
 Ornamento delle belle & virtuose donne, page 8 (verso)  
 Souvenir of New York with Manhattan from West Hoboken, New Jersey  
 [Snow Crystal]  
 [Album]  
 Scene 14, from Jack and the Giant Killer, Scenes for a Toy Theater  
 The Boston Tea Party, bakery card from the Frontiers of Freedom series  
 (D39-4), issued by the Gordon Bread Company  
 Honduras, bakery card from the Flags series (D34), issued by the Ward-Mackey  
 Company  
 Terracotta rim fragment of a kylix (drinking cup)  
 Frederick II The Great, King of Prussia (1712-1786)

Desert near Alexandria  
 Terracotta fragment of a kylix (drinking cup)  
 Jo-Jo White, from the Goudey Wide Pen Premiums series (R314) issued by the  
 Goudey Gum Company  
 "Cy" Blanton, from the National Chicle Fine Pen Premiums series (R313) issued  
 by the National Chicle Gum Company  
 Album 324, Page 86  
 Silenus being carried by Satyrs, after Mantegna  
 Coupé/Brougham #3887  
 Ancient Temple  
 Terracotta fragment of a column-krater (bowl for mixing wine and water)  
 An indulgence with an image of Our Lord of Chalma  
 Card 44, John Morrissey, from the Prizefighters series (N269) issued by P.  
 Lorillard Company to promote Mechanics Delight Long Cut Tobacco  
 [Rusted Metal Sign: "Slow, Children"]  
 Terracotta fragment of an oinochoe (jug)  
 The Historian Animating The Mind of A Young Painter  
 Robes Modèles Historiques, Viennoise  
 Terracotta fragment of a skyphos (deep drinking cup)  
 Silas K. Johnson, Cincinnati Reds, from the Baseball Players Match Cover  
 design series (U1) issued by Diamond Match Company  
 Thrifty villagers, satisfied watching the presentation from the outside, from  
 'A celebration in the neighboring village,' published in Le Petit Journal pour  
 Rire, June 24, 1865  
 Vase with flowering branch motif (one of a pair)  
 Metal Dish  
 Card Number 164, Bob Owchinko, San Diego Padres  
 Packard-Tourist, from the "Antique Autos" series (R701-1), issued by Bowman  
 Gum Company  
 Norwegian Air Force In Canada Patrol Bomber (Northrup N3PB), from the "Modern  
 Airplanes" series (T87), issued with Wings Cigarettes by Brown and Williamson  
 Tobacco Company  
 Stonehenge  
 Psyche, holding the flask of beauty being transported by three putti  
 Landscape and Cattle

Column: Culture

American  
 Dutch  
 Japanese  
 German  
 possibly Spanish  
 China  
 Thailand  
 Japan  
 India (Guler, Punjab Hills)  
 British

Italian  
 European, Eastern  
 French  
 probably French  
 Romanian  
 European  
 possibly Greek  
 German, Silesia (Bunzlau)  
 Italian, Venice  
 German, Hanau  
 probably German  
 British, Chelsea  
 Spanish  
 Cypriot  
 Italic  
 Greek, Attic  
 Minoan  
 Minoan, Crete  
 Unknown Culture  
 Asmat people  
 Aztec  
 Atlantic Watershed  
 Abelam people  
 Quechua  
 Mexican  
 Timor  
 Iran  
 Byzantine  
 Catalan  
 South Netherlandish  
 European or Middle Eastern  
 British, Stoke-on-Trent, Staffordshire

Column: Artist Nationality

Unknown Nationality  
 Chinese  
 Japanese  
 Japanese|Japanese  
 British  
 American|American  
 Italian  
 French, born Italy  
 French|French  
 American  
 British|British  
 Belgian  
 French

French|French|French|French|French|French  
 American|American|American  
 French|French?|French  
 British|British|British|British|British|British|British  
 Italian|Bohemian  
 Dutch|Dutch|Dutch  
 French|French|French|French|French  
 Dutch  
 Netherlandish|German  
 Italian|Italian  
 French|British  
 French|Italian  
 German  
 American, born Russia  
 Finnish|Finnish  
 British, Scottish  
 Mexican  
 Italian|Italian|Italian|Italian|Italian  
 Italian|Italian|German  
 Canadian  
 Scottish|British|British, Scottish|British|British  
 Austrian  
 Italian|British  
 German|American|American|American

Column: Object Begin Date

1794  
 1700  
 1740  
 1885  
 1840  
 1701  
 1770  
 1580  
 1501  
 1590  
 1800  
 1037  
 -206  
 -300  
 1877  
 1838  
 1966  
 1790  
 1983  
 1980  
 1949

1959  
1950  
1976  
1967  
2003  
1875  
1776  
1848  
1938  
1755  
1570  
1750  
1600  
1775  
-325  
-3200  
-800  
-524  
-1600  
-2000  
1860  
1981  
1945  
1858  
1922  
1880  
1934  
1933  
1908  
1900  
1400  
300  
1200  
1850  
-3505  
-2500  
-7000  
1895  
1696  
1584  
1632  
1902  
1930  
1899  
1866  
1500  
1677  
1745

1548  
1591  
1650  
1743  
1876  
1643  
1957  
1535  
1935  
1887  
1581  
1758  
1614  
1636  
1810  
1910  
1909  
1300  
1490  
1250  
1100  
1510  
1940  
1904  
1989  
-1981  
-1295  
-3450  
-3900  
-1473  
-2124  
-1390  
1972  
1841  
1936  
1585  
1951  
1970  
1954  
1795  
1912  
1961  
1890  
1941  
1921  
1554  
1851  
1870



-500  
1125  
1782  
1842  
-530  
1530  
1884  
1545  
1960  
1784  
1865  
1872  
0  
1978  
1953  
1942  
1979  
1525

Column: Object End Date

1799.0  
1900.0  
1760.0  
1885.0  
1840.0  
1800.0  
1852.0  
1580.0  
1600.0  
1850.0  
1101.0  
-206.0  
400.0  
1899.0  
1897.0  
1838.0  
1966.0  
1810.0  
1987.0  
1989.0  
1984.0  
1967.0  
1949.0  
1959.0  
1939.0  
1980.0  
2004.0

1943.0  
1950.0  
1750.0  
1765.0  
1780.0  
1699.0  
1815.0  
-275.0  
-2000.0  
-501.0  
-475.0  
-1450.0  
1869.0  
1981.0  
1945.0  
1862.0  
1922.0  
1889.0  
1934.0  
1908.0  
2000.0  
800.0  
-3100.0  
-2500.0  
-5000.0  
1895.0  
1770.0  
1642.0  
1890.0  
1902.0  
1940.0  
1910.0  
1866.0  
1560.0  
1625.0  
1755.0  
1612.0  
1666.0  
1914.0  
1650.0  
1743.0  
1876.0  
1875.0  
1653.0  
1957.0  
1611.0  
1887.0  
1581.0

1758.0  
1935.0  
1620.0  
1548.0  
1636.0  
1931.0  
1820.0  
1909.0  
1499.0  
1999.0  
1299.0  
1270.0  
1150.0  
1520.0  
1904.0  
-1981.0  
-1295.0  
-3300.0  
-3650.0  
-1458.0  
-2124.0  
-1390.0  
-1640.0  
-1975.0  
1972.0  
1851.0  
1936.0  
1585.0  
1951.0  
1970.0  
1954.0  
1795.0  
1912.0  
1961.0  
1941.0  
1554.0  
1929.0  
1879.0  
-450.0  
1275.0  
1782.0  
1842.0  
1550.0  
1884.0  
1545.0  
-400.0  
1905.0  
1975.0

-300.0  
1784.0  
1865.0  
1872.0  
0.0  
1978.0  
1953.0  
1942.0  
1979.0  
1535.0

Column: Medium

Mahogany, ebony, ash, birch, white pine  
Earthenware  
Porcelain  
Watercolor on ivory  
Steel  
Copper-gold alloy (shakudō), copper-silver alloy (shibuichi), gold  
Silver  
Pen, ink and watercolor on paper  
Steel, wood, textile, metallic thread  
Iron, gold, silver, copper  
Steel, horn, brass, leather, copper wire  
Hanging scroll mounted as a handscroll; ink on paper  
Jade  
Bronze  
Polychrome woodblock print (surimono); ink and color on paper  
Album leaf; ink and color on silk  
Polychrome woodblock print; ink and color on paper  
Lacquer, hiramame ground, gold, red, silver and brown hiramame, raden inlay;  
Interior: nashiji and fundame  
Bamboo  
Silk / Brocaded  
Hanging scroll; ink and color on paper  
Ink on paper  
leather, metal  
leather  
rayon  
synthetic  
metal  
[no medium available]  
wool  
wool, cotton  
leather, wood, metal glass  
linen, wool  
a) leather; b) leather, metal  
synthetic, metal

leather, wool  
Cotton  
Ivory, paper  
Linen  
Leather, metallic  
Wool  
Steel, silver, niello; case: leather, silver, niello  
Gilt bronze  
Stoneware  
Gold  
Metal  
Soft-paste porcelain  
Gilt and enamel  
Needle lace  
Machine net  
Silk  
Iron  
Terracotta  
Jasper  
Haemaetite  
Albumen silver print from glass negative  
Gelatin silver print  
Bromoil print  
Glass positive  
Film negative  
Matte albumen silver print from glass negative  
Stone, pigment  
Jadeite  
Paper, paint  
Camelid hair  
Stone  
Cotton, glass beads  
Ceramic, paint  
Copper alloy  
Calcite  
Lithograph  
Pen and brown ink, over black chalk, on beige paper  
Engraving  
Etching  
Chromolithography  
Illustrations: wood engraving  
Wood engraving, hand colored  
Illustrations: photomechanical process  
Illustrations: photographic method and color prints  
Unknown Medium  
Heliotype print  
Dark brown ink, black chalk, and incised lines  
Etching; only state

Etching; first state of four (Hind)  
 Pen and brown ink, brush and brown wash, over black chalk.  
 Pen and brown ink, brush and brown ink, over lead point or graphite.  
 Graphite and orange and brown pencil  
 Engraving and etching; second state of three  
 Printed book with engraved illustrations  
 Pen and black ink, watercolor and gouache with gum arabic  
 Pen and black ink, watercolor and gouache  
 Watercolor with gold  
 Etching and drypoint; second of two states  
 Etching, aquatint and drypoint; states 1-8  
 Engraving from a circular plate  
 Silkscreen  
 Commercial color lithography reproducing drawings  
 Etching and engraving; third state of three  
 Commercial color lithograph  
 Engraving; first state of two (Lieure)  
 Etching; second state of two (Lieure)  
 Lithography, hand-colored  
 Photolithograph  
 Earthenware; incised decoration through a white slip and coloring under a transparent glaze.  
 Cotton; painted  
 Plaster; cast  
 Ink, opaque watercolor, and gold on paper  
 Black chalk, pen and brown ink, heightened with white.  
 Colorless glass  
 White and pot-metal glass with vitreous paint  
 Marble  
 Colorless glass, silver stain, vitreous paint  
 Graphite on paper  
 Glass  
 Watercolor and graphite on paper  
 Ink, watercolor, metallic paint, and graphite on paper  
 Pottery  
 Limestone, ink, paint  
 Limestone, organic material, paint, malachite  
 Pottery, paint  
 Wood  
 Grasses  
 Pottery and ink, paint  
 Granite  
 Commercial printing in color  
 Albumen print (glossy finish)  
 Chiaroscuro woodcut from four blocks printed in orange  
 Etching and engraving  
 Color lithograph  
 Drypoint

Albumen photograph  
 Oil and tape on canvas  
 Woodcut  
 Hand-colored lithograph with tint stone  
 Glass, ceramic  
 Etching and stipple  
 Daguerreotype  
 Commercial Lithographs  
 Graphite and red crayon on wove paper with perforated linen tape adhered to  
 left edge for binding  
 Photo-relief and letterpress on buff paper  
 Painted metal  
 Hand-colored etching  
 Design: Lithography  
 Printed matchbook  
 Lithograph on newsprint; third state of three (Delteil)  
 Bone china  
 Commercial Color Lithograph  
 Sugar-lift aquatint with roulette

Column: Credit Line

Friends of the American Wing Fund, 1962  
 Rogers Fund, 1913  
 Rogers Fund, 1933  
 Gift of Mr. and Mrs. Franklin Chace, 1969  
 Fletcher Fund, 2006  
 The Collection of Giovanni P. Morosini, presented by his daughter Giulia,  
 1932  
 The Howard Mansfield Collection, Gift of Howard Mansfield, 1936  
 Gift of Bashford Dean, 1923  
 Bashford Dean Memorial Collection, Funds from various donors, 1929  
 Bashford Dean Memorial Collection, Gift of Edward S. Harkness, 1929  
 H. O. Havemeyer Collection, Bequest of Mrs. H. O. Havemeyer, 1929  
 Gift of Rutherford Stuyvesant, 1891  
 Bequest of John M. Crawford Jr., 1988  
 Gift of Samuel T. Peters, 1913  
 Samuel Eilenberg Collection, Bequest of Samuel Eilenberg, 1998  
 Charles Stewart Smith Collection, Gift of Mrs. Charles Stewart Smith, Charles  
 Stewart Smith Jr., and Howard Caswell Smith, in memory of Charles Stewart Smith,  
 1914  
 Rogers Fund, 1922  
 The Howard Mansfield Collection, Purchase, Rogers Fund, 1936  
 Edward C. Moore Collection, Bequest of Edward C. Moore, 1891  
 Rogers Fund, 1909  
 The Lin Yutang Family Collection, Gift of Richard M. Lai, Jill Lai Miller,  
 and Larry C. Lai, in memory of Taiyi Lin Lai, 2005  
 Gift of Cynthia Hazen Polsky, 2011

Gift of Linda A. Rosenthal, 1993  
 Gift of Holly Solomon, 1999  
 Gift of Calvin Klein, Inc., 1998  
 Gift of Muriel Kallis Newman, 2002  
 Gift of Mrs. William Rand, 1975  
 Museum Accession  
 Gift of Mary S. Ryan, 1981  
 Gift of Beth and Herbert Levine, 1977  
 Gift of Mrs. Stowe C. Phelps, 1980  
 Gift of Miss Irene Lewisohn and Alice Lewisohn Crowley, 1939  
 Purchase, Richard Martin Bequest and Friends of The Costume Institute Gifts,  
 2006  
 Gift of Martin F. Price, 2017  
 Catharine Breyer Van Bomel Foundation Fund, 2008  
 Brooklyn Museum Costume Collection at The Metropolitan Museum of Art, Gift of  
 the Brooklyn Museum, 2009; Gift of Louise M. Coleman, 1941  
 Brooklyn Museum Costume Collection at The Metropolitan Museum of Art, Gift of  
 the Brooklyn Museum, 2009; Gift of George Arents in memory of Annie Walter  
 Arents, 1949  
 Brooklyn Museum Costume Collection at The Metropolitan Museum of Art, Gift of  
 the Brooklyn Museum, 2009; Gift of The Jason and Peggy Westerfield Collection,  
 1969  
 Brooklyn Museum Costume Collection at The Metropolitan Museum of Art, Gift of  
 the Brooklyn Museum, 2009; Gift of Colonel and Mrs. Horace Figuers, 1973  
 Brooklyn Museum Costume Collection at The Metropolitan Museum of Art, Gift of  
 the Brooklyn Museum, 2009; Gift of Mrs. Albert Ogden in memory of Sheldon  
 Stewart, 1964  
 Gift of R. Stuyvesant, 1893  
 Gift of J. Pierpont Morgan, 1906  
 Gift of Mrs. Robert W. de Forest, 1920  
 Samuel D. Lee Fund, 1939  
 Bequest of Catherine D. Wentworth, 1948  
 Gift of Gustavus A. Pfeiffer, 1953  
 Gift of Irwin Untermyer, 1964  
 Gift of Sir William H. Redding, in memory of his wife, 1907  
 Purchase by subscription, 1909  
 Gift of Ann Payne Blumenthal, 1936  
 Gift of Mrs. Janet S. Kaffenburgh in memory of her grandmother Mrs. Joseph  
 Garson of Rochester, N.Y., 1976  
 Gift of Martin and Roberta Lerner, 2009  
 The Cesnola Collection, Purchased by subscription, 1874-76  
 Purchase, 1896  
 Gift of Henry S. Washington, 1919  
 Bequest of Richard B. Seager, 1926  
 Gift of Lucien Goldschmidt, 1981  
 Gift of the artist, 1983  
 Gift of Paul F. Walter, in memory of Christopher Hemphill, 1987  
 Purchase, The Horace W. Goldsmith Foundation Gift, through Joyce and Robert



Menschel, 1989

Gift of Clarence McK. Lewis, 1954

Gift of Charles Bregler, 1947

Walker Evans Archive, 1994

Gilman Collection, Purchase, Sam Salz Foundation Gift, 2005

The Michael C. Rockefeller Memorial Collection; Gift of Nelson A. Rockefeller and Mrs. Mary C. Rockefeller, 1965

The Michael C. Rockefeller Memorial Collection, Bequest of Nelson A. Rockefeller, 1979

Gift of Lita Osmundsen, 1992

Bequest of Arthur M. Bullowa, 1993

Bequest of John B. Elliott, 1997

Rogers Fund, 1938

Purchase, Schimmel Foundation Inc. Gift, 1965

Gift of Sheldon and Barbara Breitbart, 1985

Gift of Bessie Potter Vonnoh, 1941

Rogers Fund, 1964

Harris Brisbane Dick Fund, 1927

Harris Brisbane Dick Fund, 1926

A. Hyatt Mayor Purchase Fund, Marjorie Phelps Starr Bequest, 1987

Anonymous Gift, 1941

Gift of Lincoln Kirstein, 1964

The Elisha Whittelsey Collection, The Elisha Whittelsey Fund, 1960

Gift of Lincoln Kirstein, 1986

The Elisha Whittelsey Collection, The Elisha Whittelsey Fund, 1963

The Elisha Whittelsey Collection, The Elisha Whittelsey Fund, 1962

The Elisha Whittelsey Collection, The Elisha Whittelsey Fund, 1966

Gift of Janos Scholz and Anne Bigelow Scholz, in memory of Flying Officer Walter Bigelow Rosen, RCAF, 1949

Purchase, Joseph Pulitzer Bequest, 1917

Gift of Mrs. David Keppel, 1960

Mrs. Regina Slatkin, 1963

Gift of Cornelius Vanderbilt, 1880

Purchase, Emily Crane Chadborne Bequest, 1972

Gift of Mrs. Hugo Elliot, 1941

Rogers Fund, 1952

Gift of William Brewster, 1923

Gift of the Royal Institute of British Architects, 1961

John B. Turner Fund, 2011

Purchase, C. G. Boerner Gift, 2011

Gift of the Work Projects Administration, Allocation Unit, Chicago, 1943

The Elisha Whittelsey Collection, The Elisha Whittelsey Fund, 1951

The Jefferson R. Burdick Collection, Gift of Jefferson R. Burdick

Bequest of Phyllis Massar, 2011

Gift of Sarah Lazarus, 1891

Gift of Harry G. Friedman, 1959

Robert B. Dodson Fund, 1931

Gift of Georgiana W. Sargent, in memory of John Osborne Sargent, 1924

Gift of Robert D. Brewster, 1951  
 Rogers Fund, 1926  
 Rogers Fund, 1937  
 Purchase, Louis V. Bell Fund and The Vincent Astor Foundation Gift, 1974  
 Robert Lehman Collection, 1975  
 Gift of Dr. Bashford Dean, 1923  
 Gift of Lawrence J. Majewski, 1963  
 The Cloisters Collection, 1982  
 The Cloisters Collection, 1925  
 The Cloisters Collection, 1932  
 Gift of Mr. and Mrs. Meyer Schapiro, 1983  
 Purchase, Theodore R. Gamble Jr. Gift, in honor of his mother, Mrs. Theodore Robert Gamble, 1988  
 Purchase, Lila Acheson Wallace Gift, 1994  
 Gift of Peter T. Joseph, 1995  
 Alfred Stieglitz Collection, 1949  
 Gift of Albert M. Lythgoe, 1917  
 Gift of Theodore M. Davis, 1909  
 Rogers Fund, 1907  
 Rogers Fund, 1936  
 Rogers Fund, 1931  
 Rogers Fund, 1917  
 Rogers Fund and Edward S. Harkness Gift, 1920  
 Gift of Dry Dock Savings Bank, 1973  
 Gift of Lucy Chauncey, in memory of her father, Henry Chauncey, 1935  
 Anonymous Gift, 2014  
 Gift of Susan Dwight Bliss, 1958  
 Museum Accession, transferred from the Library  
 Purchase, Jade Lau Gift, 2015  
 San Francisco Museum of Modern Art, Purchase through a gift of Phyllis Wattis  
 Gift of Carl Zigrosser, 1930  
 Rogers Fund, 1921  
 The Edward W. C. Arnold Collection of New York Prints, Maps and Pictures,  
 Bequest of Edward W. C. Arnold, 1954  
 Purchase, Alfred Stieglitz Society Gifts, 2015  
 Gift of Eva Kasiska, 1947  
 The Elisha Whittelsey Collection, The Elisha Whittelsey Fund, 1952  
 Gift of Dietrich von Bothmer, Distinguished Research Curator, Greek and Roman  
 Art, 2011  
 Gift of Clarence H. Mackay, Archer M. Huntington, Stephen H. P. Pell and  
 Bashford Dean, 1928  
 Harris Brisbane Dick Fund, 1917  
 Purchase, Philippe de Montebello Fund, Mr. and Mrs. John A. Moran Gift, in  
 memory of Louise Chisholm Moran, Joyce F. Menschel and Annette de la Renta  
 Gifts, and funds from various donors, 2016 (2016.97)  
 Harris Brisbane Dick Fund, 1947  
 The Elisha Whittelsey Collection, The Elisha Whittelsey Fund, 1946  
 The Elisha Whittelsey Collection, The Elisha Whittelsey Fund, 1959

Harris Brisbane Dick Fund, 1932  
Harris Brisbane Dick Fund, 1936  
Gift of Helene Fortunoff and Robert Grossman, 2017  
Gift of George R. Goldner, in honor of Stewart Goldner, 2016  
Gift of Jerry S. Flum, 1980  
Bequest of Grace Pugh, 1985  
Gift of Henry Levien, 1967

Column: Country  
United States  
Netherlands  
Unknown Country  
Indonesia  
Mexico  
Costa Rica  
Papua New Guinea  
Peru  
Egypt  
India  
Iran  
present-day Uzbekistan  
France  
present-day France  
USA

#### 2.3.4 2.4 Convert the Object End Date column from float to int.

```
[15]: data['Object End Date'] = data['Object End Date'].astype(int)
```

/tmp/ipykernel\_6874/31033456.py:1: 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](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)  
data['Object End Date'] = data['Object End Date'].astype(int)

```
[16]: data
```

```
[16]:
```

	Object ID	Department	Object Name \
0	1674	American Decorative Arts	Side Chair
1	2430	American Decorative Arts	Pitcher
2	6406	American Decorative Arts	Plate
3	7616	American Decorative Arts	Soup bowl

4	15012	American Decorative Arts	Painting, miniature
..	...	...	...
199	779306	Drawings and Prints	Trade card
200	785013	Drawings and Prints	Print; ephemera
201	813925	Drawings and Prints	Print
202	820618	Drawings and Prints	Print
203	824428	Drawings and Prints	Print

		Title	Culture \
0		Side Chair	American
1		Covered Pitcher	American
2		Plate	Dutch
3		Soup Bowl	American
4		Portrait of a Lady	American
..		...	...
199	Packard-Tourist, from the "Antique Autos" seri...	Unknown	Culture
200	Norwegian Air Force In Canada Patrol Bomber (N...	Unknown	Culture
201		Stonehenge	Unknown Culture
202	Psyche, holding the flask of beauty being tran...	Unknown	Culture
203		Landscape and Cattle	Unknown Culture

	Artist Nationality	Object Begin Date	Object End Date \
0	Unknown Nationality	1794	1799
1	Unknown Nationality	1700	1900
2	Unknown Nationality	1740	1760
3	Unknown Nationality	1885	1885
4	Unknown Nationality	1840	1840
..	...	...	...
199	Unknown Nationality	1953	1953
200	Unknown Nationality	1942	1942
201	Unknown Nationality	1979	1979
202	Unknown Nationality	1525	1535
203	Unknown Nationality	1875	1885

	Medium \
0	Mahogany, ebony, ash, birch, white pine
1	Earthenware
2	Earthenware
3	Porcelain
4	Watercolor on ivory
..	...
199	Commercial color lithograph
200	Commercial color lithograph
201	Sugar-lift aquatint with roulette
202	Engraving
203	Etching

	Credit Line	Country
0	Friends of the American Wing Fund, 1962	United States
1	Rogers Fund, 1913	United States
2	Rogers Fund, 1933	Netherlands
3	Gift of Mr. and Mrs. Franklin Chace, 1969	United States
4	Fletcher Fund, 2006	Unknown Country
..	...	...
199	The Jefferson R. Burdick Collection, Gift of J...	Unknown Country
200	The Jefferson R. Burdick Collection, Gift of J...	Unknown Country
201	Gift of Jerry S. Flum, 1980	Unknown Country
202	Bequest of Grace Pugh, 1985	Unknown Country
203	Gift of Henry Levien, 1967	Unknown Country

[200 rows x 11 columns]

### 2.3.5 2.5 Make Column 'Cluture' consistent

```
[24]: def clean_culture(value):
    value = value.title().strip()
    value = value.replace('Possibly ', '').replace('Probably ', '')

    replacements = {
        'Japan': 'Japanese',
        'China': 'Chinese',
        'German, Silesia (Bunzlau)': 'German',
        'German, Hanau': 'German',
        'British, Chelsea': 'British',
        'British, Stoke-On-Trent, Staffordshire': 'British',
        'Asmat People': 'Asmat',
        'Abelam People': 'Abelam'
    }

    if value in replacements:
        value = replacements[value]

    if 'European, Eastern' in value:
        value = 'Eastern European'

    return value

data['Culture'] = data['Culture'].apply(clean_culture)

for value in data['Culture'].unique():
    print(value)
```

American

Dutch

Japanese  
 German  
 Spanish  
 Chinese  
 Thailand  
 India (Guler, Punjab Hills)  
 British  
 Italian  
 Eastern European  
 French  
 Romanian  
 European  
 Greek  
 Italian, Venice  
 Cypriot  
 Italic  
 Greek, Attic  
 Minoan  
 Minoan, Crete  
 Unknown Culture  
 Asmat  
 Aztec  
 Atlantic Watershed  
 Abelam  
 Quechua  
 Mexican  
 Timor  
 Iran  
 Byzantine  
 Catalan  
 South Netherlandish

/tmp/ipykernel\_6874/3628953335.py:24: 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](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)  
 data['Culture'] = data['Culture'].apply(clean\_culture)

### 2.3.6 2.6 Make Column ‘Artist Nationality’ consistent

```

[23]: def clean_nationality(value):
        value = value.title().strip()
        nationalities = set(value.split('|'))
        nationalities = {nat.replace('?', '').strip() for nat in nationalities}
        cleaned_value = ', '.join(sorted(nationalities))
        cleaned_value = cleaned_value.replace('Born ', '')
  
```

```

    return cleaned_value

data['Artist Nationality'] = data['Artist Nationality'].apply(clean_nationality)
for value in data['Artist Nationality'].unique():
    print(value)

```

```

Unknown Nationality
Chinese
Japanese
British
American
Italian
French, Italy
French
Belgian
Bohemian, Italian
Dutch
German, Netherlandish
British, French
French, Italian
German
American, Russia
Finnish
British, Scottish
Mexican
German, Italian
Canadian
British, British, Scottish, Scottish
Austrian
British, Italian
American, German

```

```

/tmp/ipykernel_6874/3114047027.py:9: 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](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)

```

data['Artist Nationality'] = data['Artist
Nationality'].apply(clean_nationality)

```

### 2.3.7 2.7 Make Column ‘Object End Date’ & ‘Object Begin Date’ consistent

```

[29]: invalid_rows = data[data['Object End Date'] < data['Object Begin Date']]
      print("Invalid rows where End Date is smaller than Begin Date:")
      invalid_rows

```

Invalid rows where End Date is smaller than Begin Date:

```

[29]:      Object ID      Department Object Name \
95      360750 Drawings and Prints      Print

                                           Title      Culture \
95 Head of a muscular old man in profile to left ... Unknown Culture

      Artist Nationality Object Begin Date Object End Date \
95 Bohemian, Italian      1677      1625

      Medium      Credit Line \
95 Etching; only state Purchase, Joseph Pulitzer Bequest, 1917

      Country
95 Unknown Country

```

```

[30]: data = data.drop(invalid_rows.index)

```

```

[31]: def convert_to_bc(value):
      if value < 0:
          return f"B.C. {-value}" # If negative, add 'B.C.' prefix and take the
          ↪ absolute value
      else:
          return str(value) # Otherwise, convert the number to a string

data['Object Begin Date'] = data['Object Begin Date'].apply(convert_to_bc)
data['Object End Date'] = data['Object End Date'].apply(convert_to_bc)
data

```

```

[31]:      Object ID      Department      Object Name \
0      1674 American Decorative Arts      Side Chair
1      2430 American Decorative Arts      Pitcher
2      6406 American Decorative Arts      Plate
3      7616 American Decorative Arts      Soup bowl
4      15012 American Decorative Arts Painting, miniature
..      ...
199      779306 Drawings and Prints      Trade card
200      785013 Drawings and Prints      Print; ephemera
201      813925 Drawings and Prints      Print
202      820618 Drawings and Prints      Print
203      824428 Drawings and Prints      Print

                                           Title      Culture \
0      Side Chair      American
1      Covered Pitcher      American
2      Plate      Dutch
3      Soup Bowl      American

```



4	Portrait of a Lady	American
..	...	...
199	Packard-Tourist, from the "Antique Autos" seri...	Unknown Culture
200	Norwegian Air Force In Canada Patrol Bomber (N...	Unknown Culture
201	Stonehenge	Unknown Culture
202	Psyche, holding the flask of beauty being tran...	Unknown Culture
203	Landscape and Cattle	Unknown Culture

	Artist Nationality	Object	Begin Date	Object	End Date	\
0	Unknown Nationality		1794		1799	
1	Unknown Nationality		1700		1900	
2	Unknown Nationality		1740		1760	
3	Unknown Nationality		1885		1885	
4	Unknown Nationality		1840		1840	
..	...		...		...	
199	Unknown Nationality		1953		1953	
200	Unknown Nationality		1942		1942	
201	Unknown Nationality		1979		1979	
202	Unknown Nationality		1525		1535	
203	Unknown Nationality		1875		1885	

	Medium	\
0	Mahogany, ebony, ash, birch, white pine	
1	Earthenware	
2	Earthenware	
3	Porcelain	
4	Watercolor on ivory	
..	...	
199	Commercial color lithograph	
200	Commercial color lithograph	
201	Sugar-lift aquatint with roulette	
202	Engraving	
203	Etching	

	Credit Line	Country
0	Friends of the American Wing Fund, 1962	United States
1	Rogers Fund, 1913	United States
2	Rogers Fund, 1933	Netherlands
3	Gift of Mr. and Mrs. Franklin Chace, 1969	United States
4	Fletcher Fund, 2006	Unknown Country
..	...	...
199	The Jefferson R. Burdick Collection, Gift of J...	Unknown Country
200	The Jefferson R. Burdick Collection, Gift of J...	Unknown Country
201	Gift of Jerry S. Flum, 1980	Unknown Country
202	Bequest of Grace Pugh, 1985	Unknown Country
203	Gift of Henry Levien, 1967	Unknown Country

[199 rows x 11 columns]

### 2.3.8 2.8 Make Column 'Medium' consistent

```
[32]: data['Medium'].replace({'[no medium available]': 'Unknown', 'Unknown Medium':  
    ↪ 'Unknown'}, inplace=True)
```

/tmp/ipykernel\_6874/1732119961.py:1: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assignment using an inplace method.

The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting values always behaves as a copy.

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col].method(value) instead, to perform the operation inplace on the original object.

```
data['Medium'].replace({'[no medium available]': 'Unknown', 'Unknown Medium':  
'Unknown'}, inplace=True)
```

### 2.3.9 2.9 Make Column 'Country' consistent

```
[33]: country_replacements = {  
    'USA': 'United States',  
    'present-day Uzbekistan': 'Uzbekistan',  
    'present-day France': 'France',  
    'Unknown Country': 'Unknown',  
}  
  
def clean_country(country):  
    return country_replacements.get(country, country)  
  
data['Country'] = data['Country'].apply(clean_country)  
data
```

```
[33]:
```

	Object ID	Department	Object Name \
0	1674	American Decorative Arts	Side Chair
1	2430	American Decorative Arts	Pitcher
2	6406	American Decorative Arts	Plate
3	7616	American Decorative Arts	Soup bowl
4	15012	American Decorative Arts	Painting, miniature
..	...	...	...
199	779306	Drawings and Prints	Trade card
200	785013	Drawings and Prints	Print; ephemera
201	813925	Drawings and Prints	Print

202	820618	Drawings and Prints	Print
203	824428	Drawings and Prints	Print

		Title	Culture \
0		Side Chair	American
1		Covered Pitcher	American
2		Plate	Dutch
3		Soup Bowl	American
4		Portrait of a Lady	American
..		...	...
199	Packard-Tourist, from the "Antique Autos" seri...	Unknown	Culture
200	Norwegian Air Force In Canada Patrol Bomber (N...	Unknown	Culture
201		Stonehenge	Unknown Culture
202	Psyche, holding the flask of beauty being tran...	Unknown	Culture
203		Landscape and Cattle	Unknown Culture

	Artist Nationality	Object Begin Date	Object End Date \
0	Unknown Nationality	1794	1799
1	Unknown Nationality	1700	1900
2	Unknown Nationality	1740	1760
3	Unknown Nationality	1885	1885
4	Unknown Nationality	1840	1840
..	...	...	...
199	Unknown Nationality	1953	1953
200	Unknown Nationality	1942	1942
201	Unknown Nationality	1979	1979
202	Unknown Nationality	1525	1535
203	Unknown Nationality	1875	1885

	Medium \
0	Mahogany, ebony, ash, birch, white pine
1	Earthenware
2	Earthenware
3	Porcelain
4	Watercolor on ivory
..	...
199	Commercial color lithograph
200	Commercial color lithograph
201	Sugar-lift aquatint with roulette
202	Engraving
203	Etching

	Credit Line	Country
0	Friends of the American Wing Fund, 1962	United States
1	Rogers Fund, 1913	United States
2	Rogers Fund, 1933	Netherlands
3	Gift of Mr. and Mrs. Franklin Chace, 1969	United States

4	Fletcher Fund, 2006	Unknown
..	...	...
199	The Jefferson R. Burdick Collection, Gift of J...	Unknown
200	The Jefferson R. Burdick Collection, Gift of J...	Unknown
201	Gift of Jerry S. Flum, 1980	Unknown
202	Bequest of Grace Pugh, 1985	Unknown
203	Gift of Henry Levien, 1967	Unknown

[199 rows x 11 columns]

### 3 Task 2

**1. What are the 3 Vs of Data and explain each one in detail?** **Volume:** Refers to the massive amount of data generated every second from various sources like social media, sensors, transactions. It can range from terabytes to petabytes in scale, especially with big data.

**Velocity:** Refers to the speed at which data is generated, collected, and analyzed. Real-time or near real-time data processing is often required for timely decision-making.

**Variety:** Describes the different types and formats of data - structured (databases), semi-structured (XML, JSON), and unstructured (text, images, videos).

**2. List capabilities of Business Intelligence systems.** Data Analysis and Analytics

Reporting and Dashboarding

Data Mining and Pattern Recognition

Predictive Analytics

Performance Metrics Tracking

Data Visualization

Real-time Monitoring

**3. Different types of data with example for each type.** Structured Data: Database tables, spreadsheets (e.g., customer records in SQL)

Semi-structured Data: Email, XML files (e.g., web logs)

Unstructured Data: Social media posts, images, videos (e.g., customer reviews)

**4. Define data visualization.** Data visualization is the graphical representation of data and information using visual elements like charts, graphs, maps, and dashboards. It helps users understand trends, patterns, and insights by making data more accessible and easier to interpret.

**5. What is a KPI and provide an example (apart from one that has been already provided within the lecture)** KPI stands for Key Performance Indicator, and in the context of data, Data KPIs are specific and measurable metrics used to track the performance, quality, or impact of data within an organization.

**6. What is a BI system?** Business intelligence includes data analytics and business analytics but uses them only as parts of the whole process. BI helps users draw conclusions from data analysis. It combines data collection, data storage, and knowledge management with analysis to evaluate the performance of a business. Data scientists dig into the specifics of data, using advanced statistics and predictive analytics to discover patterns and forecast future patterns.

**7. What are the 5 C's of Data for data preparation and the purpose of each?** Clean: Remove errors, duplicates, and inconsistencies to ensure data quality

Complete: Ensure all necessary data is present and fill gaps

Consistent: Maintain uniformity across all data sets

Current: Ensure data is up-to-date and relevant

Comprehensive: Include all relevant aspects of the data needed

**8. What are some Key Success Factors of a Successful BI Program and explain each factor?** Executive Sponsorship and Support: Senior management commitment to provide resources and champion the BI initiative

Clear Business Objectives: Well-defined goals aligned with organizational strategy

Data Quality Management: Ensuring accurate, reliable, and consistent data

User Training and Adoption: Comprehensive training programs and support for end-users

Scalable Infrastructure: Robust technical infrastructure that can grow with business needs

Regular Assessment and Updates: Continuous evaluation and improvement of BI systems

Cross-functional Collaboration: Effective communication between IT and business units