```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.impute import SimpleImputer
from sklearn.impute import MissingIndicator
from sklearn.preprocessing import LabelEncoder, OneHotEncoder
from sklearn.preprocessing import MinMaxScaler, StandardScaler, Normalizer

%matplotlib inline
sns.set(style="ticks")


data = pd.read_csv('./sample_data/master.csv', sep=",")

# размер набора данных
data.shape
```

```
(27820, 12)
```

```
# типы колонок
data.dtypes
```

```
country               object
year                   int64
sex                   object
age                   object
suicides_no            int64
population             int64
suicides/100k pop    float64
country-year          object
HDI for year         float64
 gdp_for_year ($)     object
gdp_per_capita ($)     int64
generation            object
dtype: object
```

```
# проверим есть ли пропущенные значения
data.isnull().sum()
```

```
country                 0
year                    0
sex                     0
age                     0
suicides_no             0
population              0
suicides/100k pop       0
country-year            0
HDI for year        19456
 gdp_for_year ($)       0
gdp_per_capita ($)      0
generation              0
dtype: int64
```

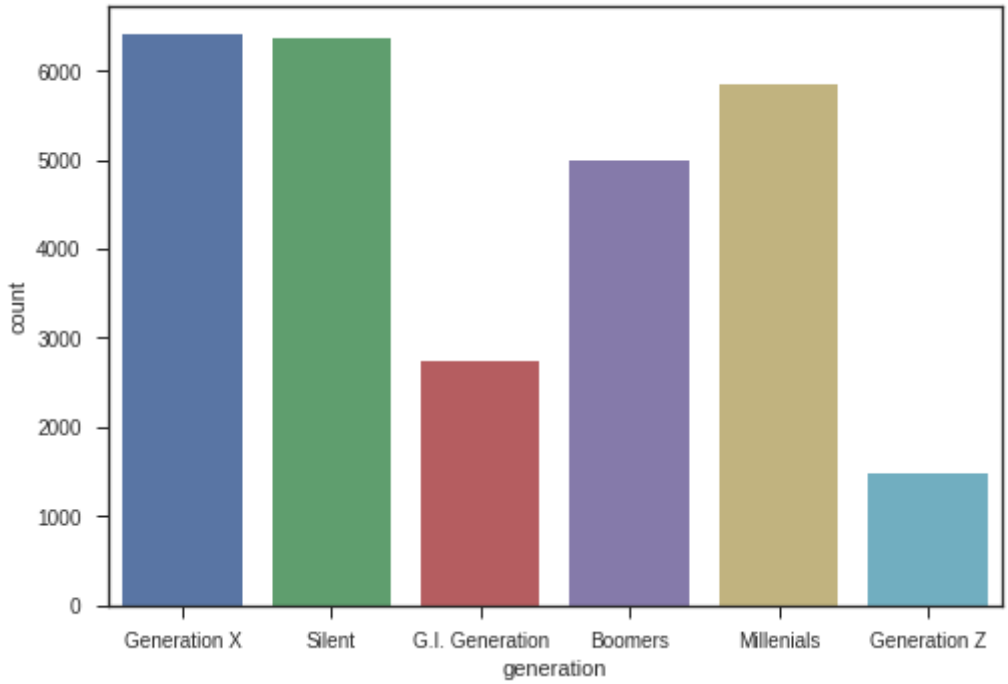
```
generation = 'generation'
population = 'population'
hdi = 'HDI for year'
age = 'age'

# Первые 5 строк датасета
data.head()
```

	country	year	sex	age	suicides_no	population	suicides/100k pop	country-year
0	Albania	1987	male	15-24 years	21	312900	6.71	Albania1987
1	Albania	1987	male	35-54 years	16	308000	5.19	Albania1987

```
sns.countplot(x=generation, data=data);
```

```
/usr/local/lib/python3.6/dist-packages/seaborn/categorical.py:1428: FutureWarning:
  stat_data = remove_na(group_data)
```

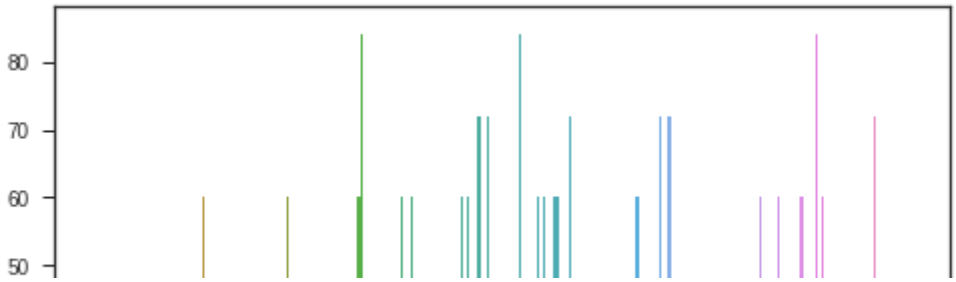



```
# Удаление строк, содержащих пустые значения
filled_data = data.dropna(axis=0, how='any')
(data.shape, filled_data.shape)
```

```
((27820, 12), (8364, 12))
```

```
sns.countplot(x=hdi, data=filled_data);
```

```
/usr/local/lib/python3.6/dist-packages/seaborn/categorical.py:1428: FutureWarning:
  stat_data = remove_na(group_data)
```




```
#категоризацмя label encoding
le = LabelEncoder()
car_enc_le = le.fit_transform(filled_data[age])
filled_data[age].unique()
```

```
array(['25-34 years', '55-74 years', '75+ years', '15-24 years',
       '35-54 years', '5-14 years'], dtype=object)
```

```
encoded_age = np.unique(data_enc_le)
encoded_age
```

```
array([0, 1, 2, 3, 4, 5])
```

```
le.inverse_transform(encoded_age)
```

```
array(['15-24 years', '25-34 years', '35-54 years', '5-14 years',
       '55-74 years', '75+ years'], dtype=object)
```

```
#категоризация bin encoding
pd.get_dummies(filled_data).head()
```

	year	suicides_no	population	suicides/100k pop	HDI for year	gdp_per_capita ($)	country_A
72	1995	13	232900	5.58	0.619	835	
73	1995	9	178000	5.06	0.619	835	
74	1995	2	40800	4.90	0.619	835	
75	1995	13	283500	4.59	0.619	835	
76	1995	11	241200	4.56	0.619	835	

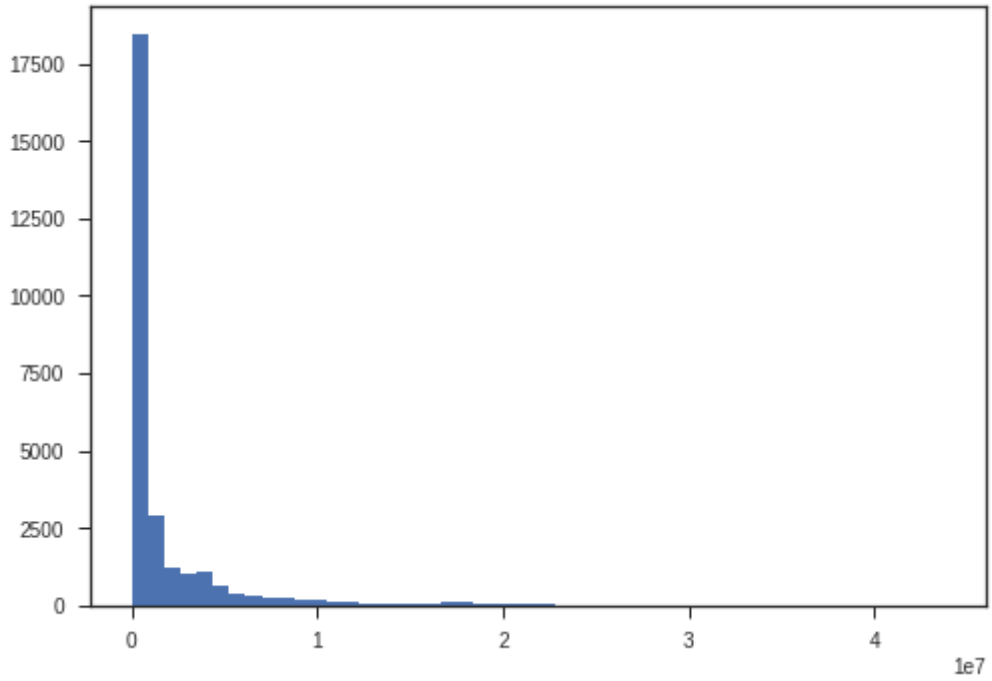
5 rows × 1504 columns

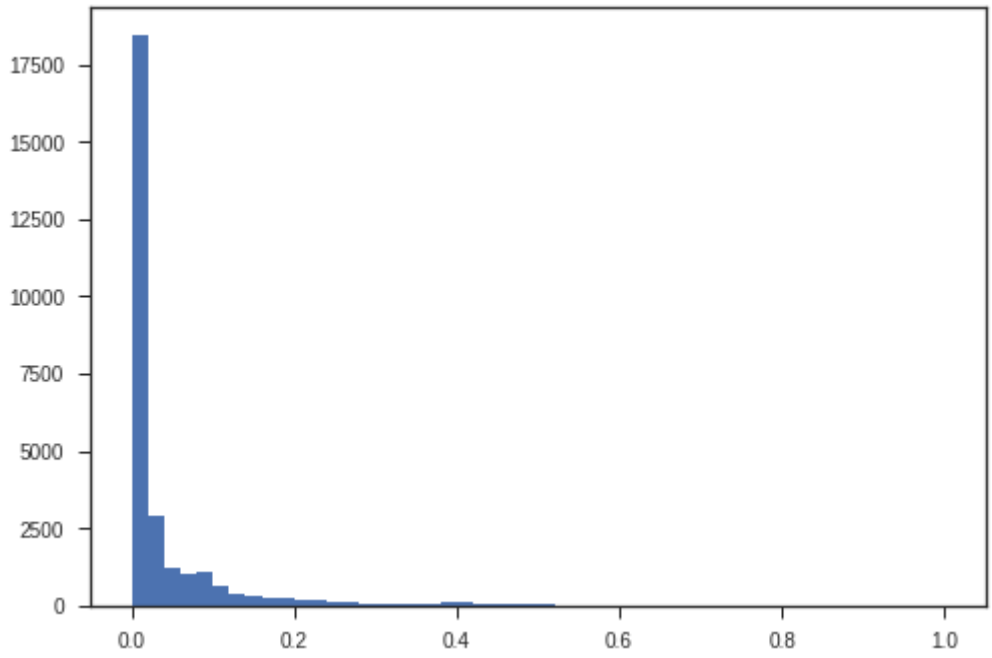
```
#масштабирование MinMax
scaler = MinMaxScaler()
scaler_data = scaler.fit_transform(data[[population]])

plt.hist(data[population], 50)
plt.show()

plt.hist(scaler_data, 50)
plt.show()
```

```
/usr/local/lib/python3.6/dist-packages/sklearn/preprocessing/data.py:334: DataConv
  return self.partial_fit(X, y)
```






```
#масштабирование данных на основе Z-оценки
scaler = StandardScaler()
scaler_data = scaler.fit_transform(data[[population]])

plt.hist(scaler_data, 50)
plt.show()
```

```
/usr/local/lib/python3.6/dist-packages/sklearn/preprocessing/data.py:645: DataConv
  return self.partial_fit(X, y)
/usr/local/lib/python3.6/dist-packages/sklearn/base.py:464: DataConversionWarning:
  return self.fit(X, **fit_params).transform(X)
```


```
#масштабирование нормализация
scaler = Normalizer()
scaler_data = scaler.fit_transform(data[[population]])

plt.hist(scaler_data, 50)
plt.show()
```