Румянцев Олег ИУ5-22М Вариант№ 9

In [1]:

```
# This Python 3 environment comes with many helpful analytics libraries insta
# It is defined by the kaggle/python Docker image: https://github.com/kaggle/
# For example, here's several helpful packages to load

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)

# Input data files are available in the read-only "../input/" directory
# For example, running this (by clicking run or pressing Shift+Enter) will li

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# You can write up to 20GB to the current directory (/kaggle/working/) that g
# You can also write temporary files to /kaggle/temp/, but they won't be save
```

```
/kaggle/input/world-happiness-report-2021/world-happiness-report-2021.csv
/kaggle/input/world-happiness-report-2021/world-happiness-report.csv
```

In [2]:

```
hap_report_dataset = pd.read_csv('/kaggle/input/world-happiness-report-2021/w
```

In [4]:

```
hap_report_dataset.describe()
```

Out[4]:

	year	Life Ladder	Log GDP per capita	Social support	Healthy life expectancy at birth	Freedom to make life choices	Gen
count	1949.000000	1949.000000	1913.000000	1936.000000	1894.000000	1917.000000	1860.0
mean	2013.216008	5.466705	9.368453	0.812552	63.359374	0.742558	0.0
std	4.166828	1.115711	1.154084	0.118482	7.510245	0.142093	0.
min	2005.000000	2.375000	6.635000	0.290000	32.300000	0.258000	-0.3
25%	2010.000000	4.640000	8.464000	0.749750	58.685000	0.647000	-0.
50%	2013.000000	5.386000	9.460000	0.835500	65.200000	0.763000	-0.0
75%	2017.000000	6.283000	10.353000	0.905000	68.590000	0.856000	0.0
max	2020.000000	8.019000	11.648000	0.987000	77.100000	0.985000	0.6

In [6]:

```
hap_report_dataset.head()
```

Out[6]:

	Country name	year	Life Ladder	Log GDP per capita	Social support	Healthy life expectancy at birth	Freedom to make life choices	Generosity	Perceptions of corruption
0	Afghanistan	2008	3.724	7.370	0.451	50.80	0.718	0.168	0.882
1	Afghanistan	2009	4.402	7.540	0.552	51.20	0.679	0.190	0.850

	Country name	year	Life Ladder	Log GDP per capita	Social support	Healthy life expectancy at birth	Freedom to make life choices	Generosity	Perceptions of corruption
2	Afghanistan	2010	4.758	7.647	0.539	51.60	0.600	0.121	0.707

Задача №9.

Для набора данных проведите устранение пропусков для одного (произвольного) числового признака с использованием метода заполнения "хвостом распределения".

In [31]:

```
missing = hap_report_dataset.isna().sum()
missing
```

Out[31]:

```
Country name                          0
year                                  0
Life Ladder                           0
Log GDP per capita                   36
Social support                       13
Healthy life expectancy at birth     55
Freedom to make life choices         32
Generosity                           89
Perceptions of corruption           110
Positive affect                      22
Negative affect                      16
dtype: int64
```

In [27]:

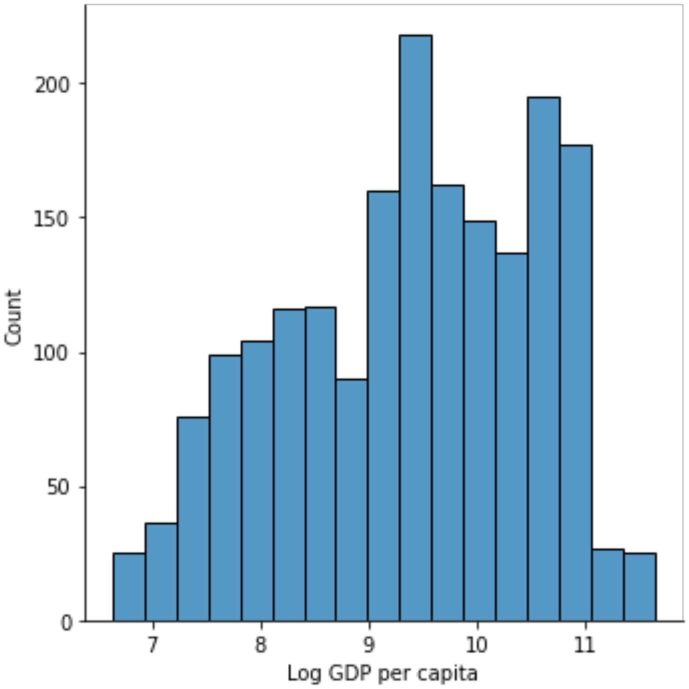
```
missing[missing > 0].keys()
```

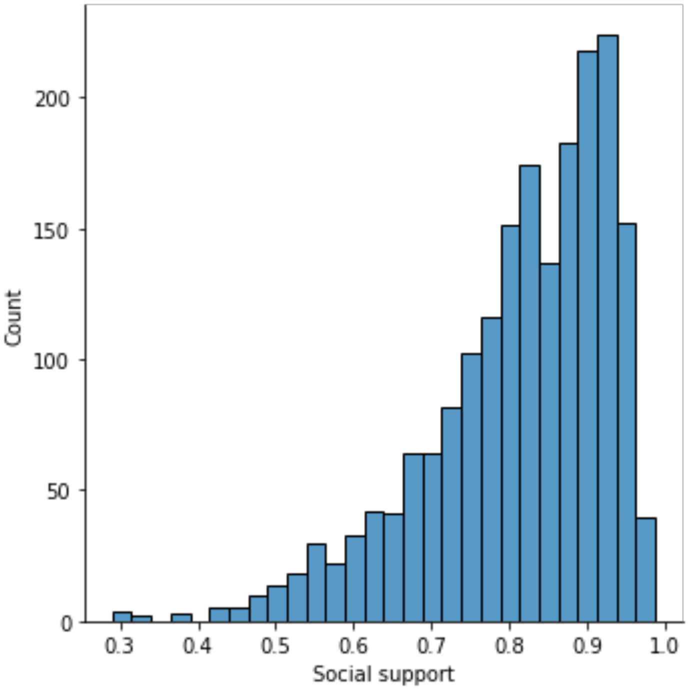
Out[27]:

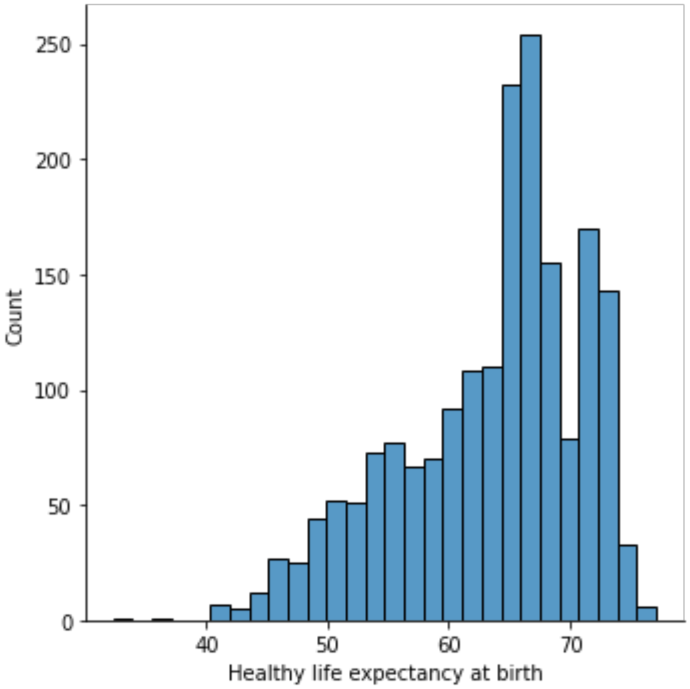
```
Index(['Log GDP per capita', 'Social support',
       'Healthy life expectancy at birth', 'Freedom to make life choices',
       'Generosity', 'Perceptions of corruption', 'Positive affect',
       'Negative affect'],
      dtype='object')
```

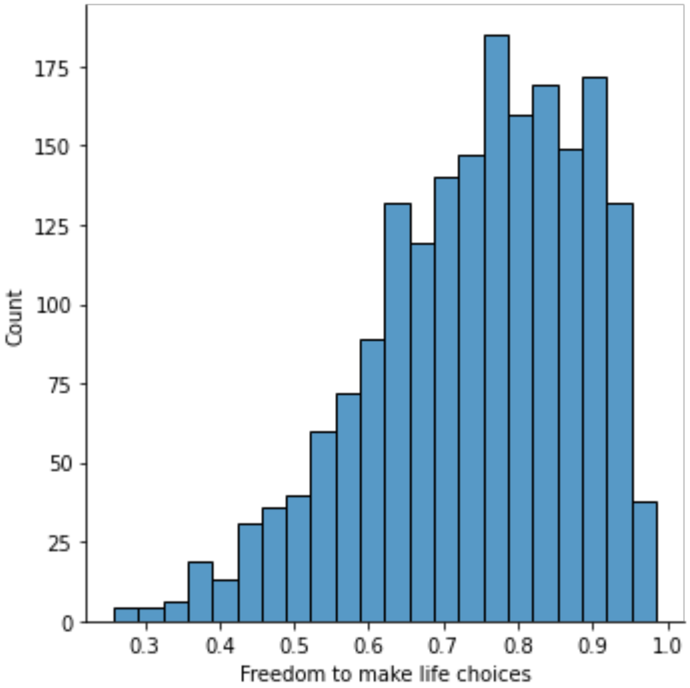
In [29]:

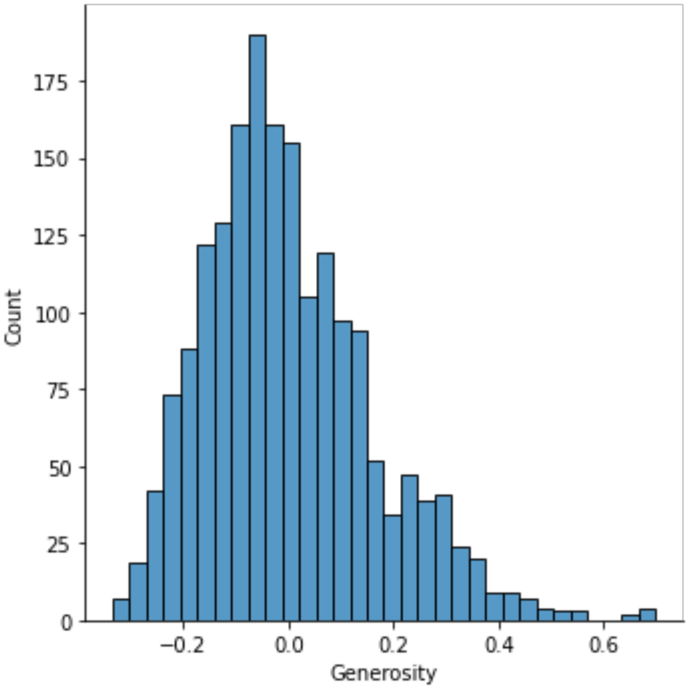
```
import matplotlib.pyplot as plt
import seaborn as sns


for key in missing[missing > 0].keys():
    sns.displot(hap_report_dataset, x=key)
# sns.displot(hap_report_dataset, x="Social support")
# sns.displot(hap_report_dataset, x="Healthy life expectancy at birth")
# sns.displot(hap_report_dataset, x="Positive affect")
```

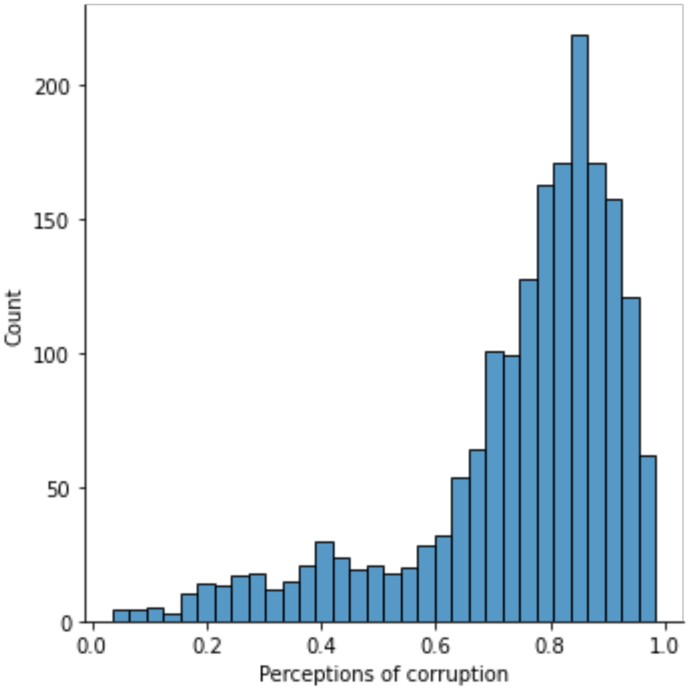

Count
0
50
100
150
200
7
8
9
10
11
Log GDP per capita

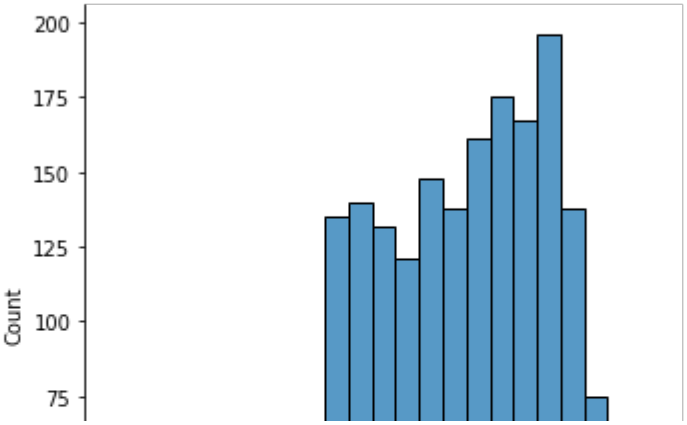

Count
0
50
100
150
200
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Social support


Count
250
200
150
100
50
0
40
50
60
70
Healthy life expectancy at birth


Count
175
150
125
100
75
50
25
0
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Freedom to make life choices


Count
175
150
125
100
75
50
25
0
−0.2
0.0
0.2
0.4
0.6
Generosity


Count
200
150
100
50
0
0.0
0.2
0.4
0.6
0.8
1.0
Perceptions of corruption


Count
200
175
150
125
100
75

In [44]:

```
k = 1.5
generosity_q3 = hap_report_dataset['Generosity'].quantile(0.75)
generosity_q1 = hap_report_dataset['Generosity'].quantile(0.25)
generosity_excess = generosity_q3 + k * (generosity_q3 - generosity_q1)
generosity_excess
```

Out[44]:

```
0.397
```

In [43]:

```
hap_report_dataset['Generosity'].describe()
```

Out[43]:

```
count    1860.000000
mean        0.000103
std         0.162215
min        -0.335000
25%        -0.113000
50%        -0.025500
75%         0.091000
max         0.698000
Name: Generosity, dtype: float64
```

In [46]:

```
new_generosity = hap_report_dataset['Generosity'].fillna(generosity_excess)
new_generosity.describe()
```

Out[46]:

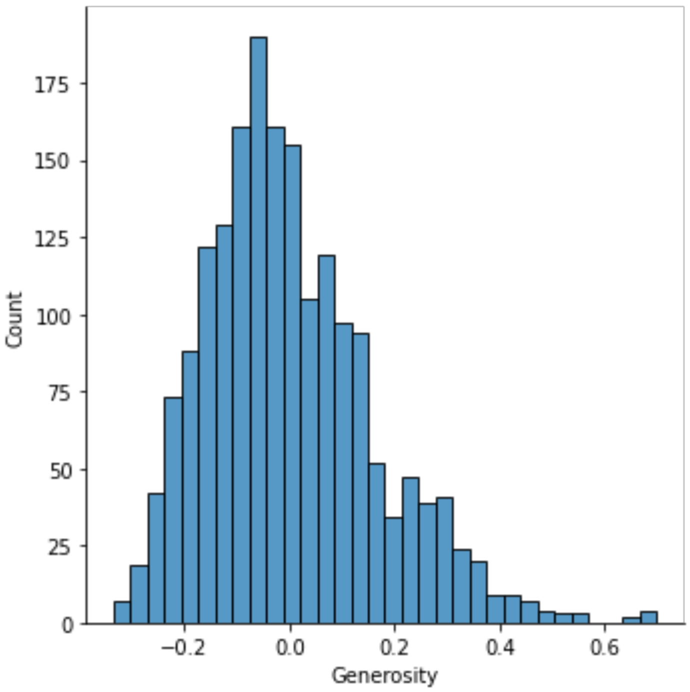
```
count    1949.000000
mean        0.018227
std         0.178830
min        -0.335000
25%        -0.106000
50%        -0.016000
75%         0.115000
max         0.698000
Name: Generosity, dtype: float64
```

In [47]:

```
sns.displot(hap_report_dataset, x='Generosity')
sns.displot(new_generosity)
```

Out[47]:

```
<seaborn.axisgrid.FacetGrid at 0x7f57405f2790>
```



In [ ]:

Задача №29.

Для набора данных проведите удаление константных и псевдоконстантных признаков.

In [66]:

```
from random import random, randint
import math

nearly_const_data = [math.ceil(random() - 0.9) for _ in range(100)]
const_data = [32 for _ in range(100)]
rnd_data = [randint(1,100) for _ in range(100)]

df = pd.DataFrame({'f1': nearly_const_data, 'f2': const_data, 'f3': rnd_data}
df.describe()
```

Out[66]:

	f1	f2	f3
count	100.000000	100.0	100.000000
mean	0.070000	32.0	58.180000
std	0.256432	0.0	28.500002
min	0.000000	32.0	2.000000
25%	0.000000	32.0	36.000000
50%	0.000000	32.0	63.500000
75%	0.000000	32.0	82.000000

f1 f2 f3

In [69]:

```
from sklearn.feature_selection import VarianceThreshold
selector = VarianceThreshold(threshold=0.1)
selector.fit_transform(df)
```

Out[69]:

```
array([[ 82],
       [ 74],
       [ 38],
       [ 75],
       [ 76],
       [  3],
       [ 65],
       [ 62],
       [  5],
       [ 68],
       [ 56],
       [ 94],
       [ 71],
       [100],
       [ 82],
       [ 52],
       [ 65],
       [ 83],
       [ 85],
       [ 96],
       [ 96],
       [ 74],
       [ 94],
       [ 61],
       [ 74],
       [ 31],
       [ 61],
       [  6],
       [ 46],
       [ 73],
       [ 63],
       [ 53],
       [ 95],
       [ 89],
       [ 68],
       [ 56],
       [ 68],
       [ 20],
       [ 90],
       [ 36],
       [ 20],
       [ 65],
       [  9],
       [ 64],
       [ 69],
       [ 80],
       [ 34],
       [ 36],
       [ 46],
       [  2],
       [ 49],
       [ 53],
       [ 59],
       [ 76],
       [ 18],
       [ 94],
       [ 98],
       [ 92],
       [ 71],
       [ 34],
       [ 85],
       [ 73],
       [  9],
       [ 41],
       [  4],
       [ 55],
       [ 24],
       [ 21],
       [ 85],
       [ 58],
       [ 12],
       [ 31],
       [ 93],
       [ 15],
       [100],
       [ 38],
       [  7],
       [ 55],
       [ 75],
       [  3],
       [ 69],
       [ 93],
       [ 65],
       [ 35],
       [ 98],
       [  8],
       [ 87],
       [ 84],
       [ 82],
       [ 97],
       [ 63],
       [ 63],
       [ 32],
       [ 36],
       [ 41],
       [ 29],
       [ 74],
       [ 64],
       [ 63],
       [ 96]])
```

```
In [ ]:
```