Untitled14

May 26, 2023

[16]:
```
import os
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
import warnings
import statsmodels.api as sm
import plotly.express as px
```

[17]:
```
#define working directory
os.chdir("E:/Kurs/Data Glacier/Week 7")
```

[18]:
```
# read and merge datasets
df1 = pd.read_csv('Age_Country.csv')
df2 = pd.read_csv('Education_Languages.csv')
df3 = pd.read_csv('Gender_SatRate.csv')
df4 = pd.read_csv('Marriage_Children.csv')

merged_df = pd.merge(df1, df2, on='Name', how='outer')
merged_df = pd.merge(merged_df, df3, on='Name', how='outer')
merged_df = pd.merge(merged_df, df4, on='Name', how='outer')

# write the merged dataframe to a new CSV file
merged_df.to_csv('master_data.csv', index=False)
```

```
C:\Users\ejot9\AppData\Local\Temp\ipykernel_19264\1445709634.py:9:
FutureWarning: Passing 'suffixes' which cause duplicate columns {'Email_x'} in
the result is deprecated and will raise a MergeError in a future version.
  merged_df = pd.merge(merged_df, df4, on='Name', how='outer')
```

[19]:
```
#Read the master data
df = pd.read_csv("master_data.csv")
```

[7]:
```
# First 5 in our dataset
df.head()
```

[7]:
```
             Name                    Email_x  Age         Country  \
0    Landon Patel     landonpatel@gmail.com   32   United States
1  Cassidy Turner   cassidyturner@yahoo.com   24          Canada
2    Axl Thompson  axl.thompson@hotmail.com   43   United States
3      Ivy Wilson       ivywilson@gmail.com   58  United Kingdom
4     Reece Scott   reece.scott@outlook.com   26       Australia

                    Email_y    Education Level  Number of Languages Spoken  \
0     landonpatel@gmail.com  Bachelor's Degree                           2
1   cassidyturner@yahoo.com    Master's Degree                           1
2  axl.thompson@hotmail.com        High School                           3
3       ivywilson@gmail.com  Bachelor's Degree                           4
4   reece.scott@outlook.com          Doctorate                           4

                  Email_x.1      Gender  Satisfaction Rate  \
0     landonpatel@gmail.com        Male                  8
1   cassidyturner@yahoo.com  Non-binary                  9
2  axl.thompson@hotmail.com        Male                  7
3       ivywilson@gmail.com      Female                  6
4   reece.scott@outlook.com        Male                  4

                  Email_y.1 Marital Status  Number of Children
0     landonpatel@gmail.com         Single                   3
1   cassidyturner@yahoo.com        Married                   4
2  axl.thompson@hotmail.com         Single                   1
3       ivywilson@gmail.com       Divorced                   0
4   reece.scott@outlook.com        Married                   2
```

[10]:
```
#Last 5 rows in our dataset
df.tail()
```

[10]:
```
            Name                    Email_x  Age         Country  \
82   Ryann Davis     ryann.davis@gmail.com   24          Canada
83  Lara Johnson    lara.johnson@yahoo.com   54   United States
84  Paislee King  paislee_king@hotmail.com   61  United Kingdom
85    Kole Scott       kole_scott@gmail.com   63       Australia
86  Alaia Taylor    alaia_taylor@yahoo.com   23   United States

                    Email_y    Education Level  Number of Languages Spoken  \
82     ryann.davis@gmail.com  Bachelor's Degree                           1
83    lara.johnson@yahoo.com    Master's Degree                           3
84  paislee_king@hotmail.com        High School                           1
85      kole_scott@gmail.com  Bachelor's Degree                           4
86    alaia_taylor@yahoo.com          Doctorate                           2

                  Email_x.1  Gender  Satisfaction Rate  \
82     ryann.davis@gmail.com  Female                 10
```

```
83    lara.johnson@yahoo.com  Female                 3
84  paislee_king@hotmail.com  Female                 4
85      kole_scott@gmail.com    Male                 8
86    alaia_taylor@yahoo.com  Female                 2

                   Email_y.1 Marital Status  Number of Children
82     ryann.davis@gmail.com         Single                   0
83    lara.johnson@yahoo.com        Married                   2
84  paislee_king@hotmail.com         Single                   1
85      kole_scott@gmail.com        Married                   3
86    alaia_taylor@yahoo.com        Married                   4
```

[11]:
```
#Master Data General information
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 87 entries, 0 to 86
Data columns (total 13 columns):
 #   Column                      Non-Null Count  Dtype
---  ------                      --------------  -----
 0   Name                        87 non-null     object
 1   Email_x                     87 non-null     object
 2   Age                         87 non-null     int64
 3   Country                     87 non-null     object
 4   Email_y                     87 non-null     object
 5   Education Level             87 non-null     object
 6   Number of Languages Spoken  87 non-null     int64
 7   Email_x.1                   87 non-null     object
 8   Gender                      87 non-null     object
 9   Satisfaction Rate           87 non-null     int64
 10  Email_y.1                   87 non-null     object
 11  Marital Status              87 non-null     object
 12  Number of Children          87 non-null     int64
dtypes: int64(4), object(9)
memory usage: 9.0+ KB
```

[12]:
```
#Correlation between numerical columns
df.corr()
```

[12]:
```
                                 Age  Number of Languages Spoken  \
Age                         1.000000                    0.125291
Number of Languages Spoken  0.125291                    1.000000
Satisfaction Rate           0.071077                   -0.090605
Number of Children         -0.081498                   -0.074881

                            Satisfaction Rate  Number of Children
Age                                  0.071077           -0.081498
Number of Languages Spoken          -0.090605           -0.074881
```

```
Satisfaction Rate                          1.000000            -0.035048
Number of Children                        -0.035048             1.000000
```

[15]:
```
#Size of Data
df.size
```

[15]:
```
1131
```

[26]:
```
#Import columns for duplication test
duplicates = df.duplicated()
```

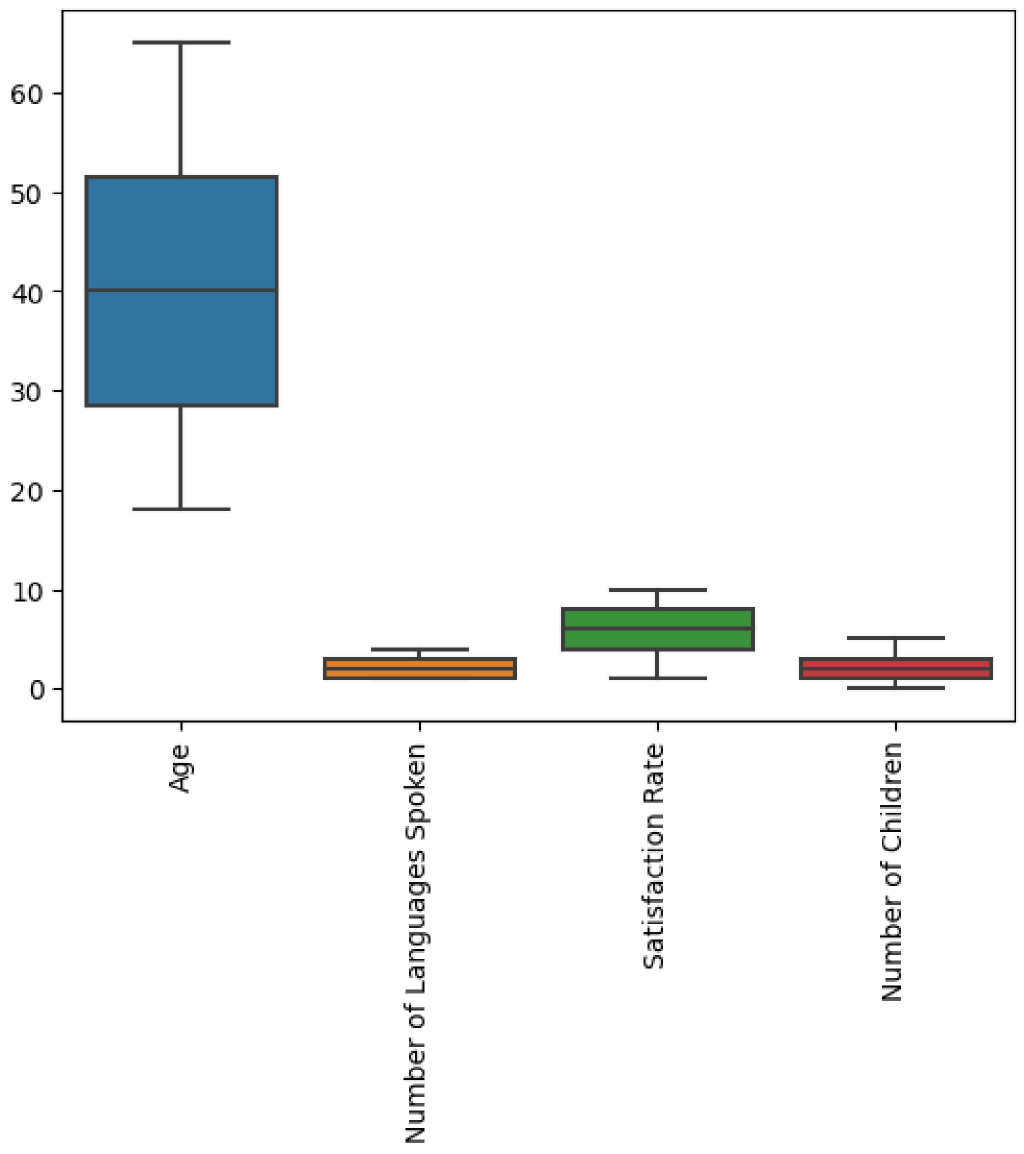
[27]:
```
# Check for Duplicates
duplicate_rows = df[duplicates]
print(duplicate_rows)
```

```
Empty DataFrame
Columns: [Name, Email_x, Age, Country, Email_y, Education Level, Number of
Languages Spoken, Email_x.1, Gender, Satisfaction Rate, Email_y.1, Marital
Status, Number of Children]
Index: []
```

[38]:
```
#Check for outliers
ax = sns.boxplot(data=df)

# Rotate the x-axis labels
ax.xaxis.set_ticklabels(ax.xaxis.get_ticklabels(), rotation=90)
```

[38]:
```
[Text(0, 0, 'Age'),
 Text(1, 0, 'Number of Languages Spoken'),
 Text(2, 0, 'Satisfaction Rate'),
 Text(3, 0, 'Number of Children')]
```



[39]:
```
# Check for missing values
missing_values = df.isnull().sum()
```

[40]:
```
# Display the count of missing values for each column
print(missing_values)
```

```
Name                            0
Email_x                         0
Age                             0
Country                         0
Email_y                         0
Education Level                 0
```

```
Number of Languages Spoken    0
Email_x.1                     0
Gender                        0
Satisfaction Rate             0
Email_y.1                     0
Marital Status                0
Number of Children            0
dtype: int64
```

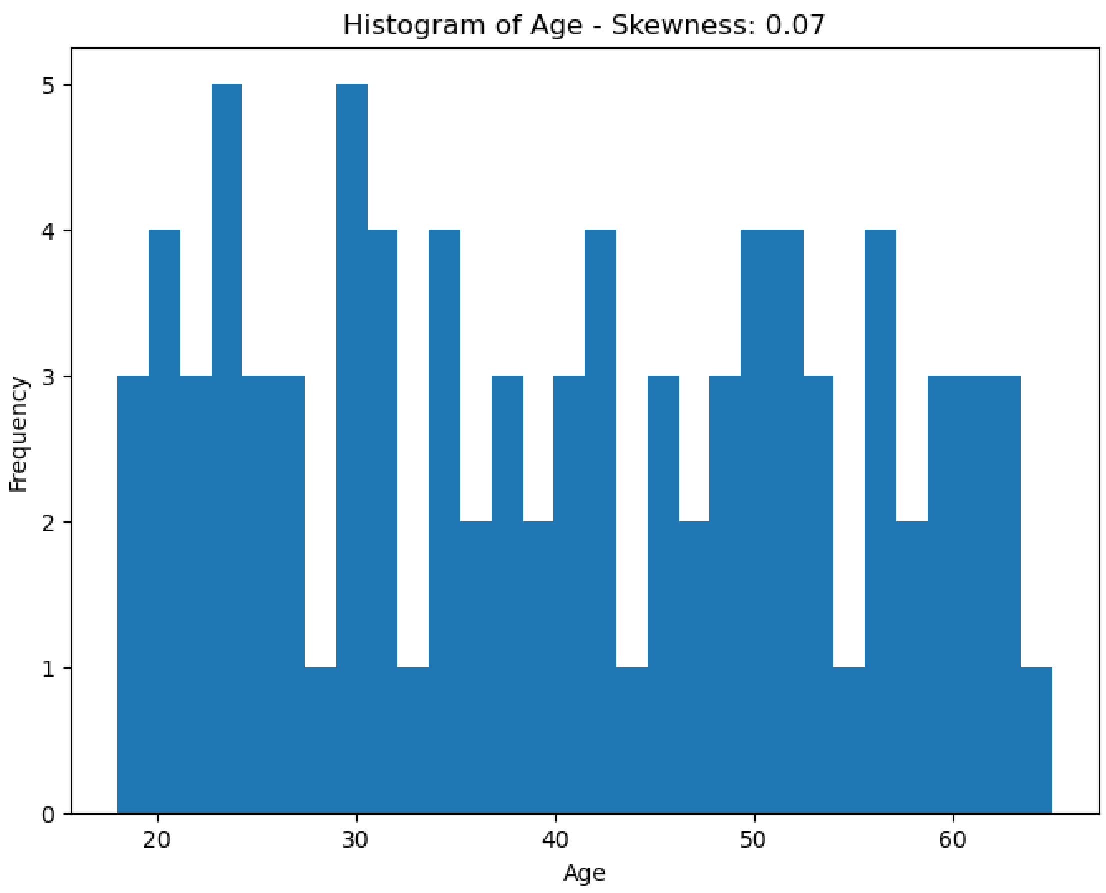
[42]:
```
# Select numeric columns
numeric_columns = df.select_dtypes(include='number')
```

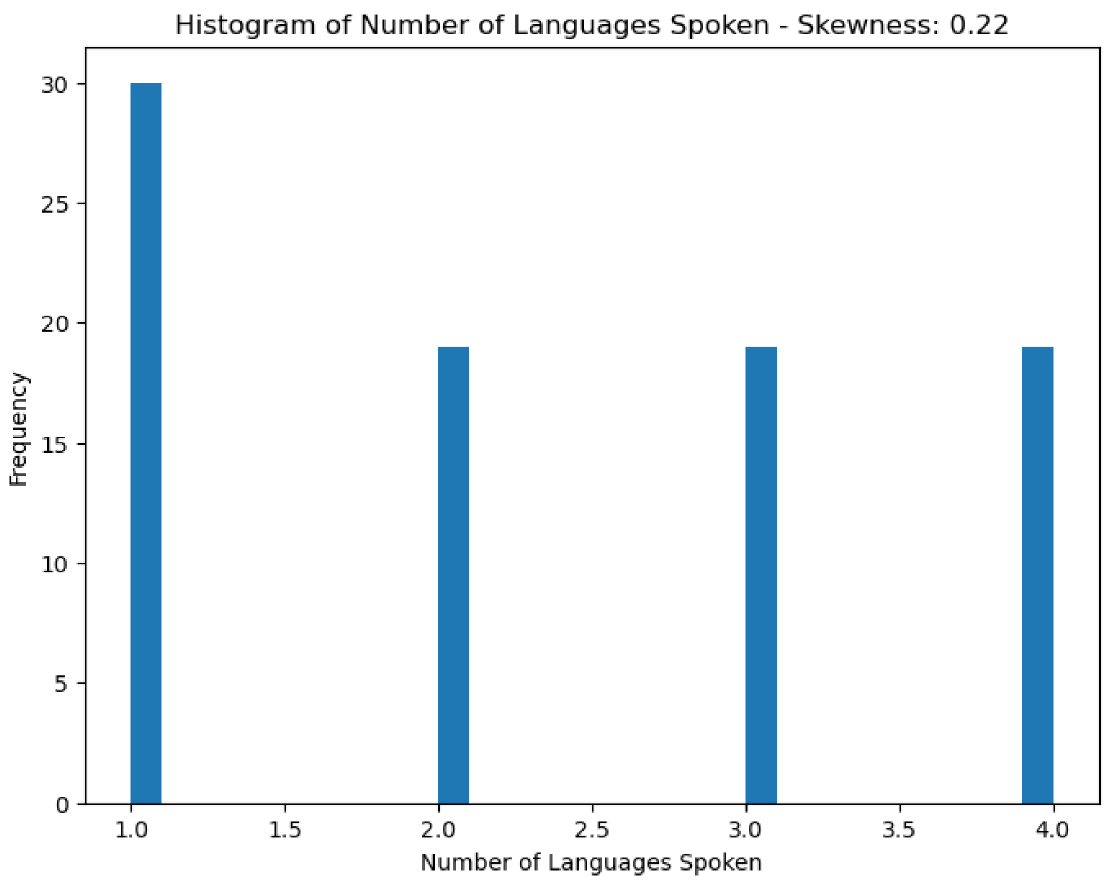
[43]:
```
# Calculate the skewness for each numeric column
skewness = numeric_columns.skew()
```

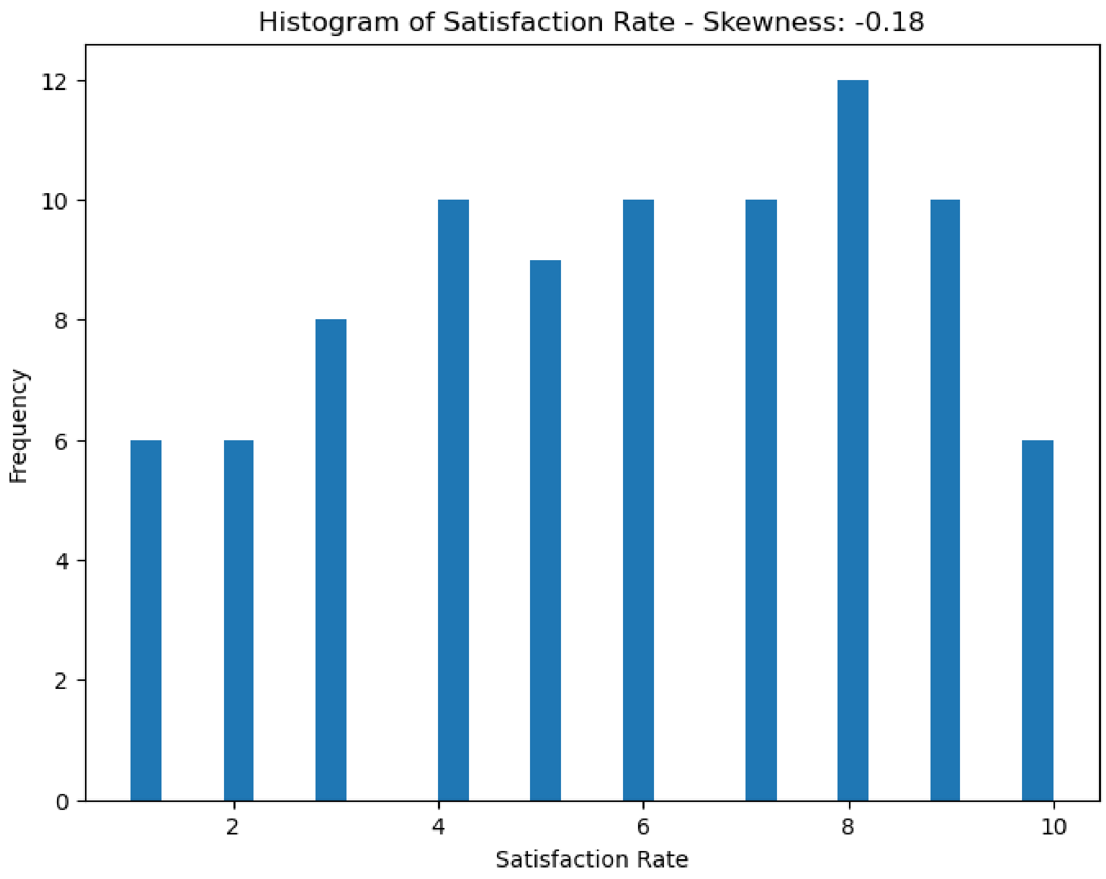
[44]:
```
# Display the skewness values
print(skewness)
```

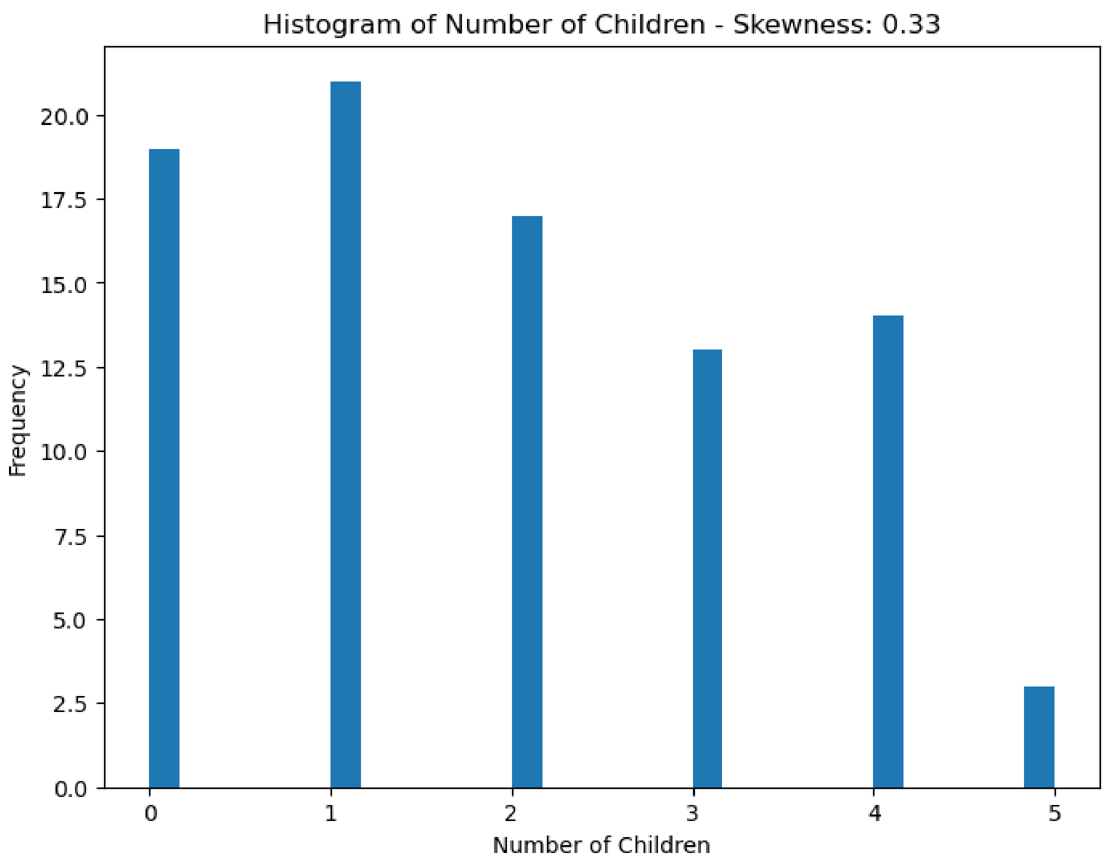
```
Age                           0.071673
Number of Languages Spoken    0.224759
Satisfaction Rate            -0.178100
Number of Children            0.330569
dtype: float64
```

[52]:
```
# Iterate over each numeric column and plot histogram
for column in numeric_columns:
    plt.figure(figsize=(8, 6))
    plt.hist(df[column], bins=30)
    plt.xlabel(column)
    plt.ylabel('Frequency')
    plt.title(f'Histogram of {column} - Skewness: {round(df[column].skew(),␣
 ↪2)}')
```


Histogram of Age - Skewness: 0.07
Frequency
Age
0
1
2
3
4
5
20
30
40
50
60


Histogram of Number of Languages Spoken - Skewness: 0.22
Frequency
Number of Languages Spoken
0
5
10
15
20
25
30
1.0
1.5
2.0
2.5
3.0
3.5
4.0


Histogram of Satisfaction Rate - Skewness: -0.18
Frequency
Satisfaction Rate
0
2
4
6
8
10
12
2
4
6
8
10


Histogram of Number of Children - Skewness: 0.33
Frequency
Number of Children
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
0
1
2
3
4
5

```
[ ]:
```