World_Bank_Science_Tech_Data_Analysis

March 19, 2025

0.1 World Bank Science and Technology Data Analysis

Importing the Data

```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
```

```python
st_data_2018 = pd.read_csv("/content/science_tech_2018.csv")
st_data_2018.head()
```

```
      Country Name  High-technology exports (% of manufactured exports)  \
0      Afghanistan                                                NaN
1          Albania                                           0.049514
2          Algeria                                                NaN
3   American Samoa                                                NaN
4          Andorra                                          28.460560

   High-technology exports (current US$)  Trademark applications, total  \
0                                    NaN                            NaN
1                               591717.0                         3713.0
2                                    NaN                         9490.0
3                                    NaN                            NaN
4                             33913480.0                         1180.0

   Trademark applications, direct resident  \
0                                      NaN
1                                    917.0
2                                   5469.0
3                                      NaN
4                                    256.0

   Trademark applications, direct nonresident  Patent applications, residents  \
0                                          NaN                             NaN
1                                       2796.0                            15.0
2                                       4021.0                           152.0
```

```
3                                    NaN                          NaN
4                                  924.0                          1.0
```

```
    Patent applications, nonresidents  \
0                                NaN
1                                3.0
2                              521.0
3                                NaN
4                               10.0
```

```
    Scientific and technical journal articles  \
0                                      111.72
1                                      180.36
2                                     5231.44
3                                         NaN
4                                        3.60
```

```
    Research and development expenditure (% of GDP)
0                                            NaN
1                                            NaN
2                                            NaN
3                                            NaN
4                                            NaN
```

[ ]: st_data_2018.info()
     st_data_2018.shape
     st_data_2018.size

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 219 entries, 0 to 218
Data columns (total 10 columns):
 #   Column                                         Non-Null Count  Dtype
---  ------                                         --------------  -----
 0   Country Name                                   219 non-null    object
 1   High-technology exports (% of manufactured exports)  132 non-null
float64
 2   High-technology exports (current US$)          131 non-null
float64
 3   Trademark applications, total                  133 non-null
float64
 4   Trademark applications, direct resident        128 non-null
float64
 5   Trademark applications, direct nonresident     129 non-null
float64
 6   Patent applications, residents                 118 non-null
float64
 7   Patent applications, nonresidents              119 non-null
```

2

```
      float64
       8    Scientific and technical journal articles          199 non-null
      float64
       9    Research and development expenditure (% of GDP)     73 non-null
      float64
      dtypes: float64(9), object(1)
      memory usage: 17.2+ KB
```

[ ]: 2190

[ ]: `st_data_2018.columns`

[ ]: Index(['Country Name', 'High-technology exports (% of manufactured exports)',
             'High-technology exports (current US$)',
             'Trademark applications, total',
             'Trademark applications, direct resident',
             'Trademark applications, direct nonresident',
             'Patent applications, residents', 'Patent applications, nonresidents',
             'Scientific and technical journal articles',
             'Research and development expenditure (% of GDP)'],
            dtype='object')

[ ]: `st_data_2009 = pd.read_csv("/content/science_tech_2009.csv")`
     `st_data_2009.head()`

[ ]:   Country Name High-technology exports (% of manufactured exports) \
     0   Afghanistan   NaN
     1   Albania   1.328024
     2   Algeria   0.653887
     3   American Samoa   NaN
     4   Andorra   12.192161

        High-technology exports (current US$) Trademark applications, total \
     0   NaN   NaN
     1   10128935.0   3456.0
     2   4616076.0   5345.0
     3   NaN   NaN
     4   10402350.0   785.0

        Trademark applications, direct resident \
     0   NaN
     1   213.0
     2   NaN
     3   NaN
     4   243.0

        Trademark applications, direct nonresident Patent applications, residents \
```

```
0                                    NaN                         NaN
1                                 3243.0                         NaN
2                                    NaN                         NaN
3                                    NaN                         NaN
4                                  542.0                         NaN

   Patent applications, nonresidents  \
0                                 NaN
1                               361.0
2                                 NaN
3                                 NaN
4                                 NaN

   Scientific and technical journal articles  \
0                                       26.30
1                                       70.35
2                                     2135.32
3                                         NaN
4                                        2.55

   Research and development expenditure (% of GDP)
0                                             NaN
1                                             NaN
2                                             NaN
3                                             NaN
4                                             NaN
```

```
[ ]: st_data_2009.info()
     st_data_2009.shape
     st_data_2009.size
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 219 entries, 0 to 218
Data columns (total 10 columns):
 #   Column                                          Non-Null Count  Dtype
---  ------                                          --------------  -----
 0   Country Name                                    219 non-null    object
 1   High-technology exports (% of manufactured exports)  131 non-null
float64
 2   High-technology exports (current US$)           131 non-null
float64
 3   Trademark applications, total                   111 non-null
float64
 4   Trademark applications, direct resident         101 non-null
float64
 5   Trademark applications, direct nonresident      101 non-null
float64
```

4

```
6   Patent applications, residents                      93 non-null
float64
7   Patent applications, nonresidents                  101 non-null
float64
8   Scientific and technical journal articles          199 non-null
float64
9   Research and development expenditure (% of GDP)     97 non-null
float64
dtypes: float64(9), object(1)
memory usage: 17.2+ KB
```

[ ]: 2190

[ ]: `st_data_2009.columns`

[ ]:
```
Index(['Country Name', 'High-technology exports (% of manufactured exports)',
       'High-technology exports (current US$)',
       'Trademark applications, total',
       'Trademark applications, direct resident',
       'Trademark applications, direct nonresident',
       'Patent applications, residents', 'Patent applications, nonresidents',
       'Scientific and technical journal articles',
       'Research and development expenditure (% of GDP)'],
      dtype='object')
```

0.2 Cleaning the Data

0.2.1 Missing Data

[ ]: `st_data_2018.isnull().sum()`

[ ]:
```
Country Name                                         0
High-technology exports (% of manufactured exports)  87
High-technology exports (current US$)                88
Trademark applications, total                        86
Trademark applications, direct resident              91
Trademark applications, direct nonresident           90
Patent applications, residents                      101
Patent applications, nonresidents                   100
Scientific and technical journal articles            20
Research and development expenditure (% of GDP)     146
dtype: int64
```

[ ]:
```
st_data_2018_clean = st_data_2018.dropna()
st_data_2018_clean.isnull().sum()
```

```
[ ]: Country Name                                                  0
     High-technology exports (% of manufactured exports)   0
     High-technology exports (current US$)                 0
     Trademark applications, total                         0
     Trademark applications, direct resident               0
     Trademark applications, direct nonresident            0
     Patent applications, residents                        0
     Patent applications, nonresidents                     0
     Scientific and technical journal articles             0
     Research and development expenditure (% of GDP)       0
     dtype: int64
```

```
[ ]: st_data_2009.isnull().sum()
```

```
[ ]: Country Name                                                    0
     High-technology exports (% of manufactured exports)    88
     High-technology exports (current US$)                  88
     Trademark applications, total                         108
     Trademark applications, direct resident               118
     Trademark applications, direct nonresident            118
     Patent applications, residents                        126
     Patent applications, nonresidents                     118
     Scientific and technical journal articles              20
     Research and development expenditure (% of GDP)       122
     dtype: int64
```

```
[ ]: st_data_2018_clean.shape
```

```
[ ]: (51, 10)
```

```
[ ]: st_data_2009_clean = st_data_2009.dropna()
     st_data_2009_clean.isnull().sum()
```

```
[ ]: Country Name                                                  0
     High-technology exports (% of manufactured exports)   0
     High-technology exports (current US$)                 0
     Trademark applications, total                         0
     Trademark applications, direct resident               0
     Trademark applications, direct nonresident            0
     Patent applications, residents                        0
     Patent applications, nonresidents                     0
     Scientific and technical journal articles             0
     Research and development expenditure (% of GDP)       0
     dtype: int64
```

```
[ ]: st_data_2009_clean.shape
```

```
[ ]: (56, 10)
```

0.3 Exploratory Data Analysis

0.3.1 Descriptive Statistics

```
[ ]: # Display descriptive statistics for the cleaned 2018 data
     #pd.set_option('display.float.format', lambda x:'%.3f'%x)
     st_data_2018_clean.describe().style.format("{:,.0f}")
```

```
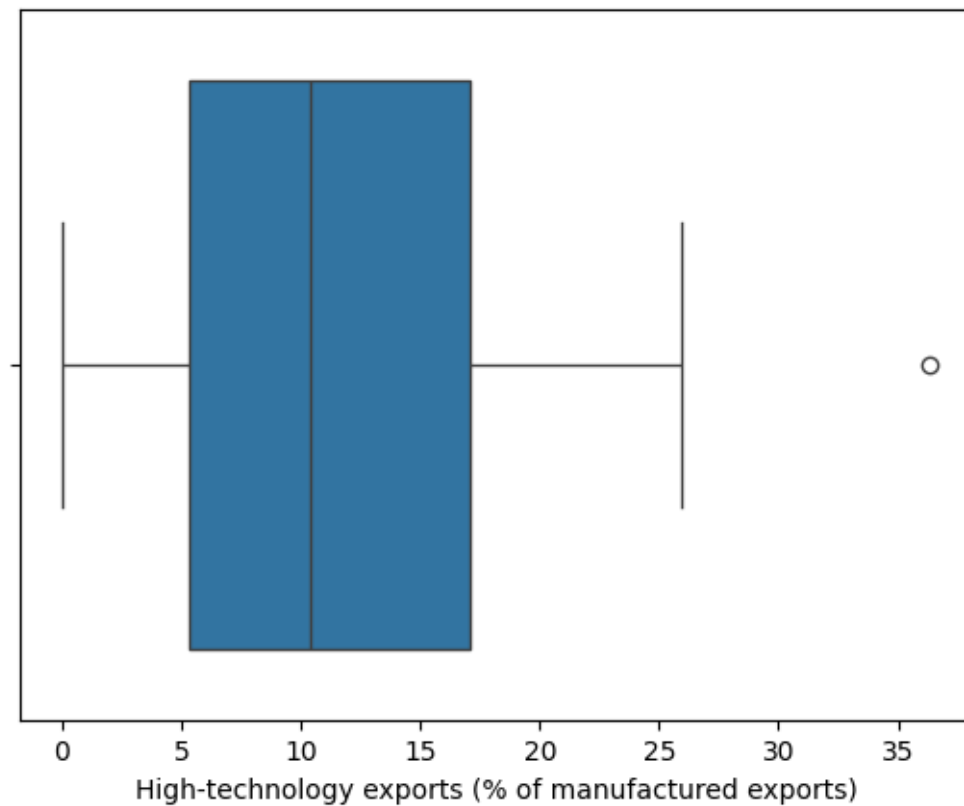[ ]: <pandas.io.formats.style.Styler at 0x7eeb85731750>
```

```
[ ]: #pd.set_option('display.float.format', lambda x:'%.3f'%x)
     st_data_2009_clean.describe().style.format("{:,.0f}")
```

```
[ ]: <pandas.io.formats.style.Styler at 0x7eeb8546e470>
```

```
[ ]: sns.boxplot(x=st_data_2009_clean["High-technology exports (% of manufactured⏎
     ↪exports)"]);
```

```
[ ]: sns.boxplot(x=st_data_2018_clean["High-technology exports (% of manufactured␣
      ↪exports)"]);
```


High-technology exports (% of manufactured exports)

##Outliers

```
[ ]: columns = st_data_2018_clean.columns
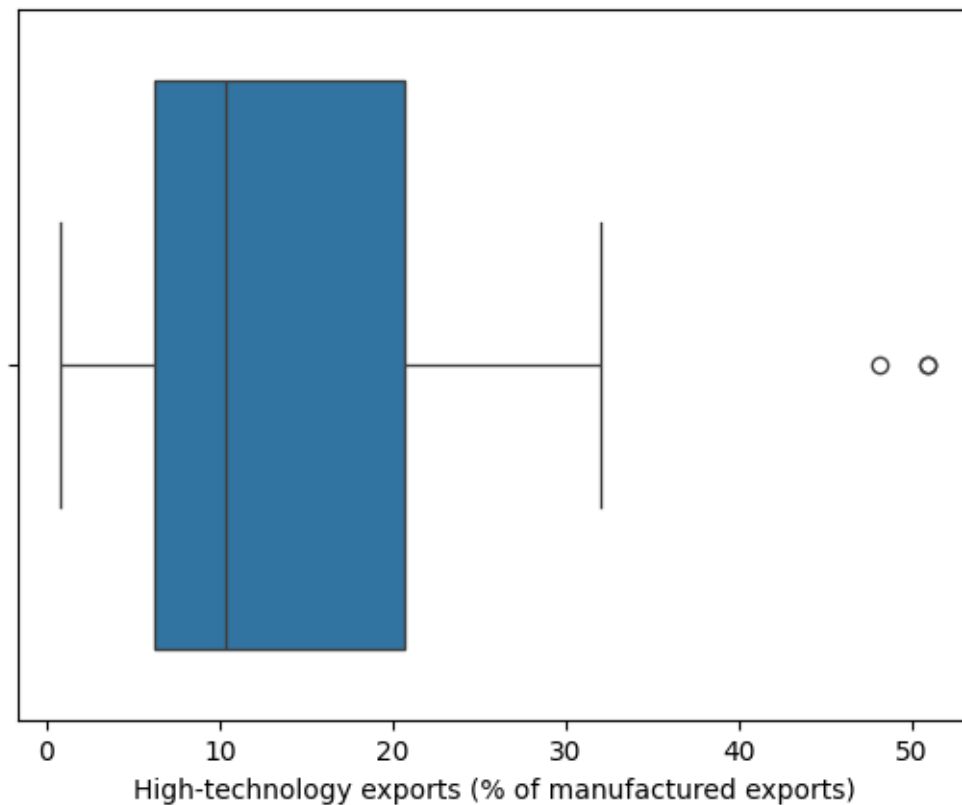
     for col in columns:
       sns.boxplot(x=st_data_2018_clean[col])
       plt.xticks(rotation=45, ha='right', fontsize=6)   # Added fontsize=8
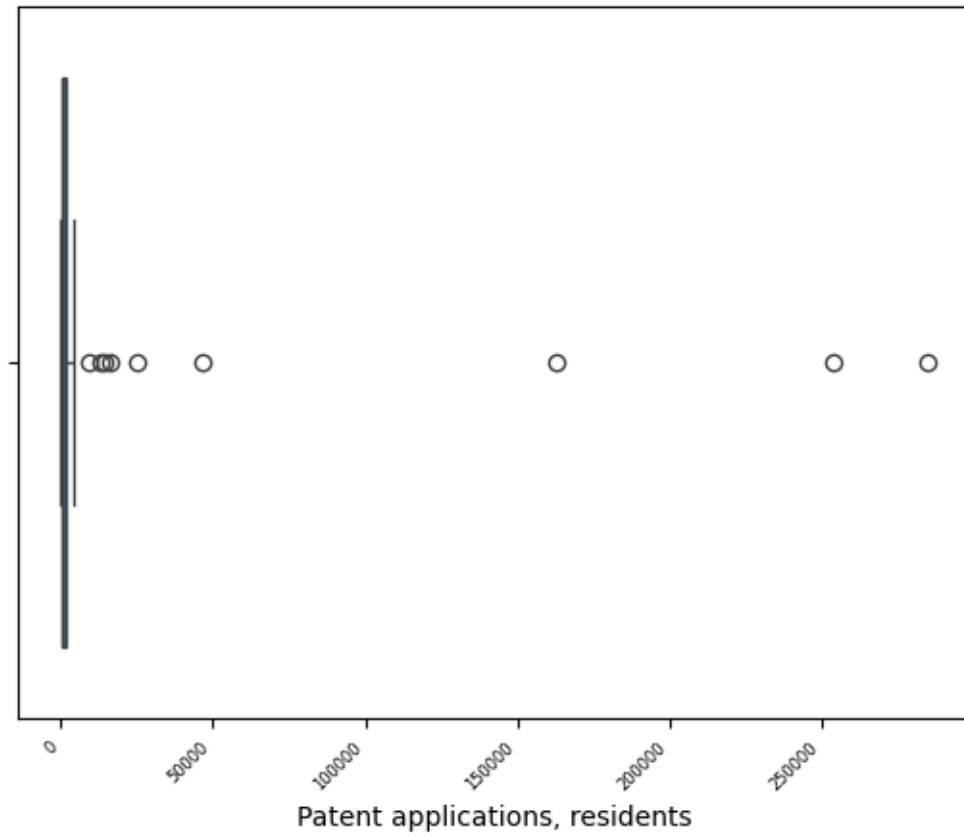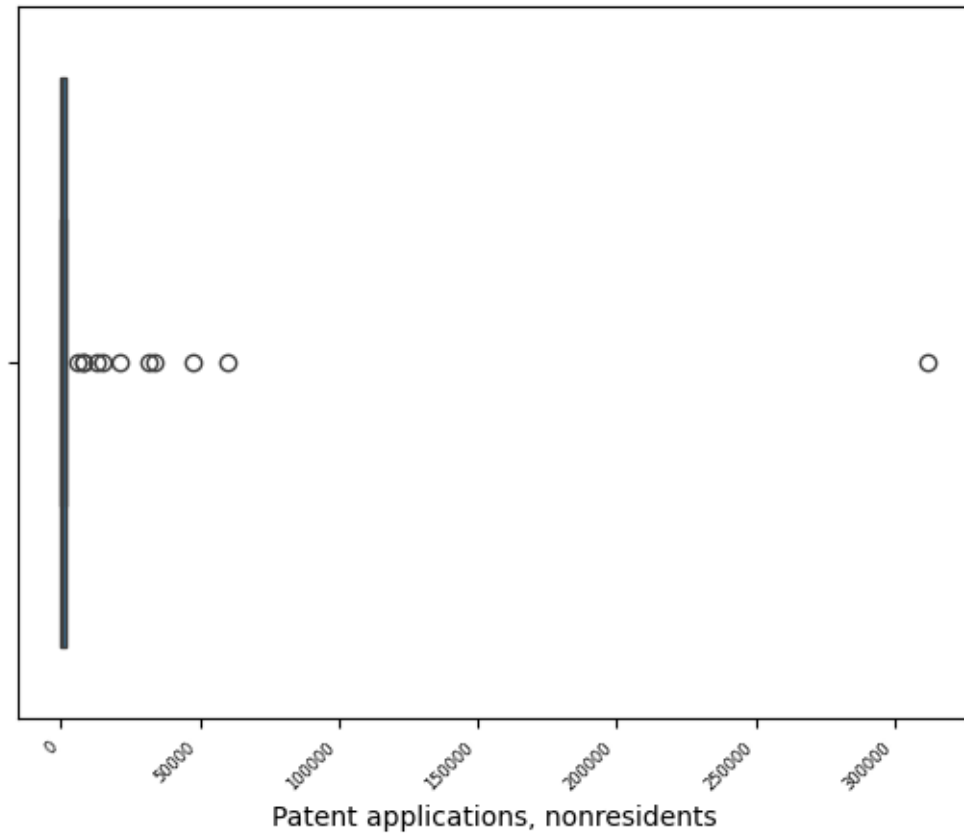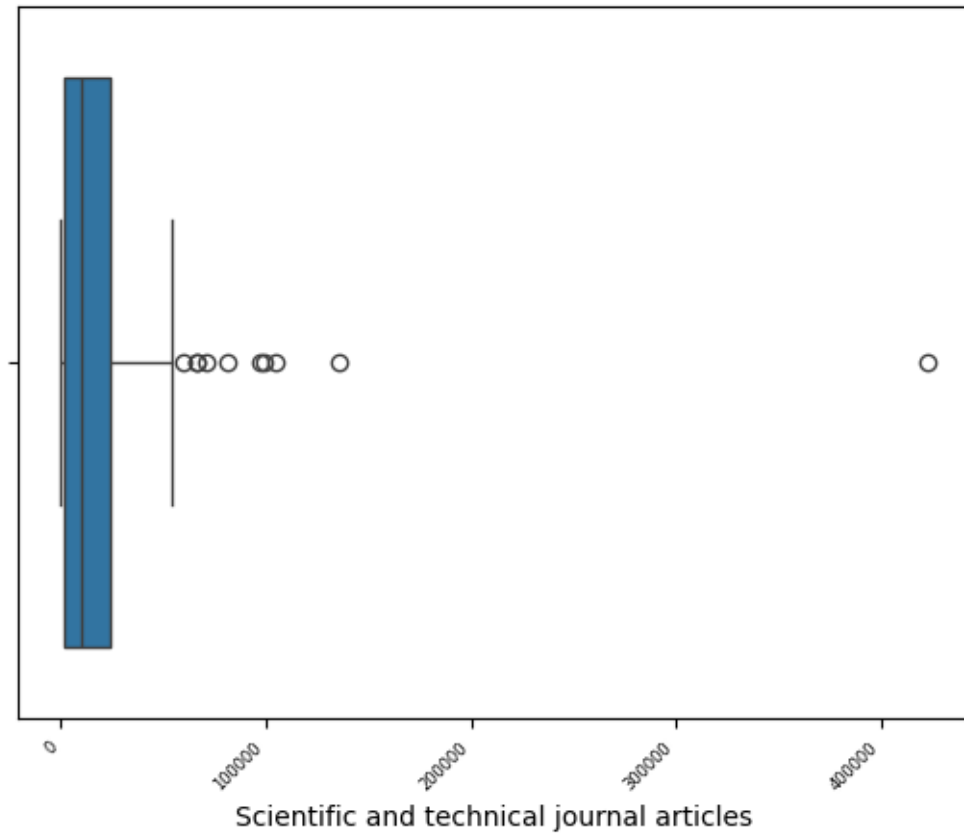       plt.show()
```

Country Name

High-technology exports (% of manufactured exports)

High-technology exports (current US$)

1e11

Trademark applications, total

Trademark applications, direct resident

Trademark applications, direct nonresident

Patent applications, residents

Patent applications, nonresidents

Scientific and technical journal articles

Research and development expenditure (% of GDP)

```
[ ]: article_max = st_data_2018_clean["Scientific and technical journal articles"].
     ↪max()
     article_max
```

```
[ ]: 422807.71
```

```
[ ]: st_data_2018_clean[st_data_2018_clean["Scientific and technical journal␣
     ↪articles"] == article_max]
```

```
[ ]:       Country Name  High-technology exports (% of manufactured exports)  \
     207   United States                                             18.896
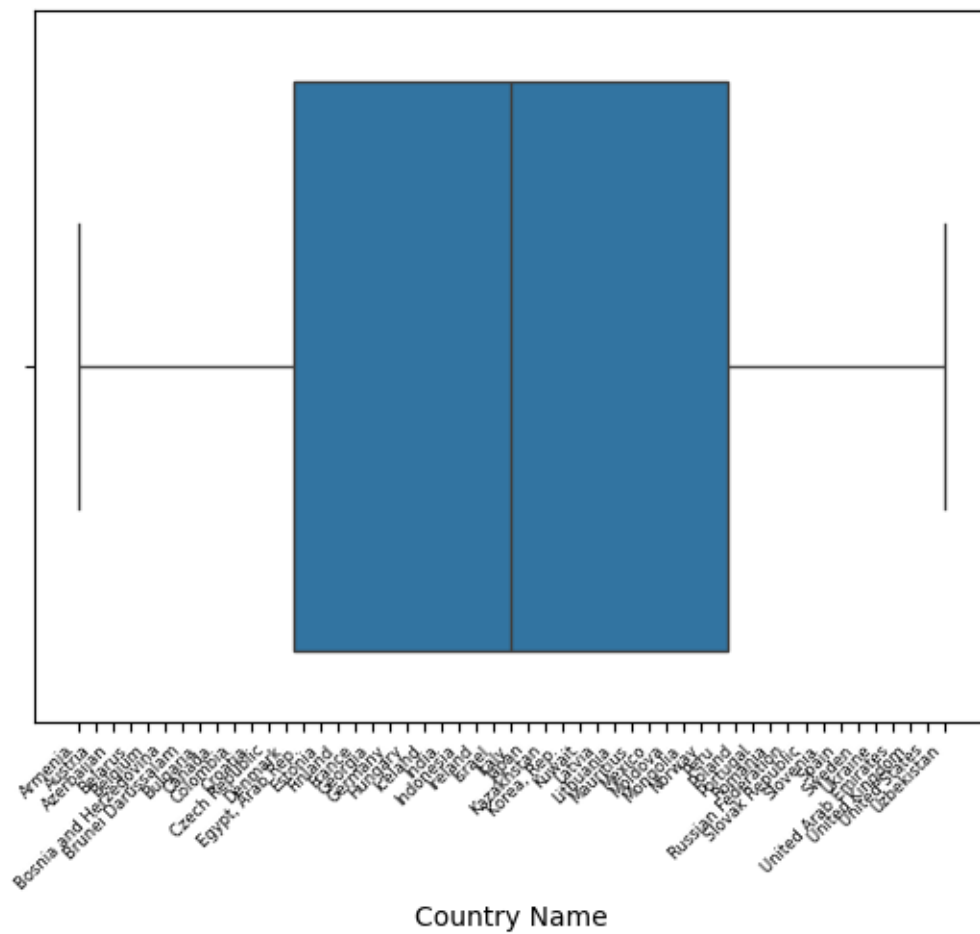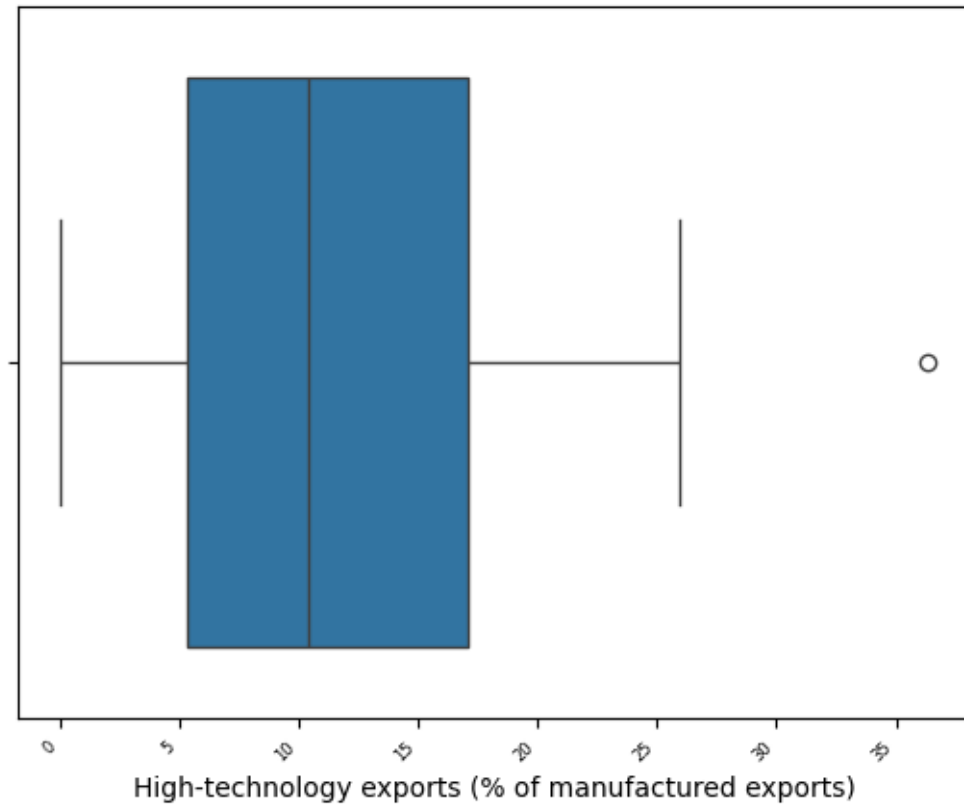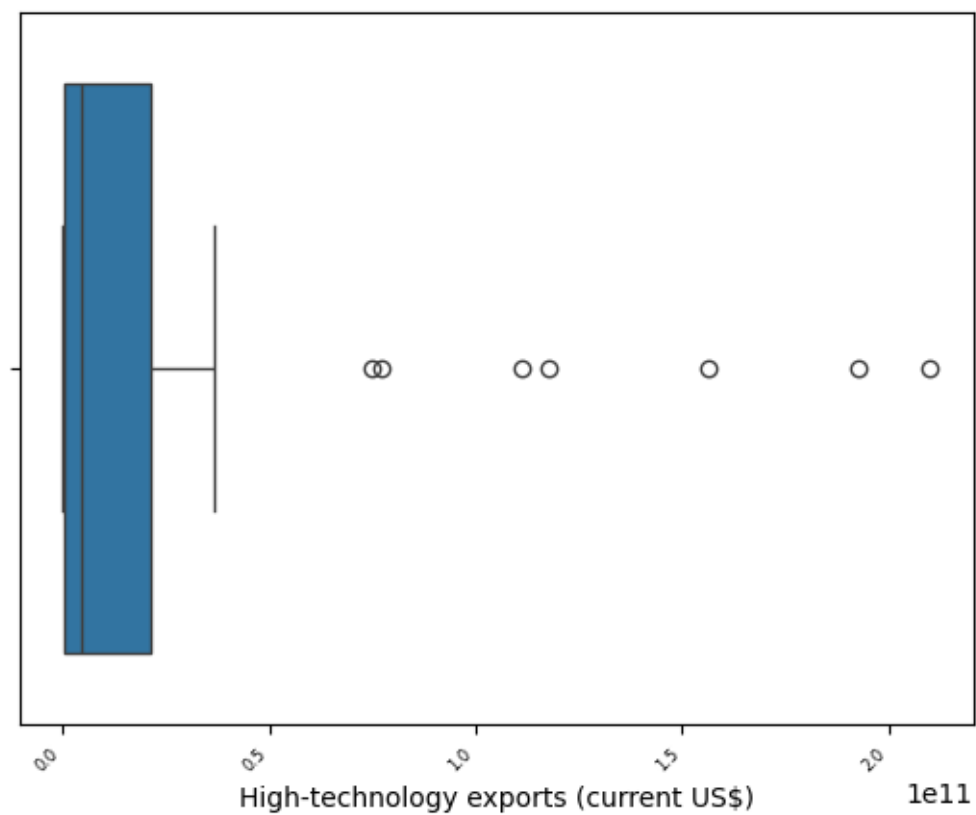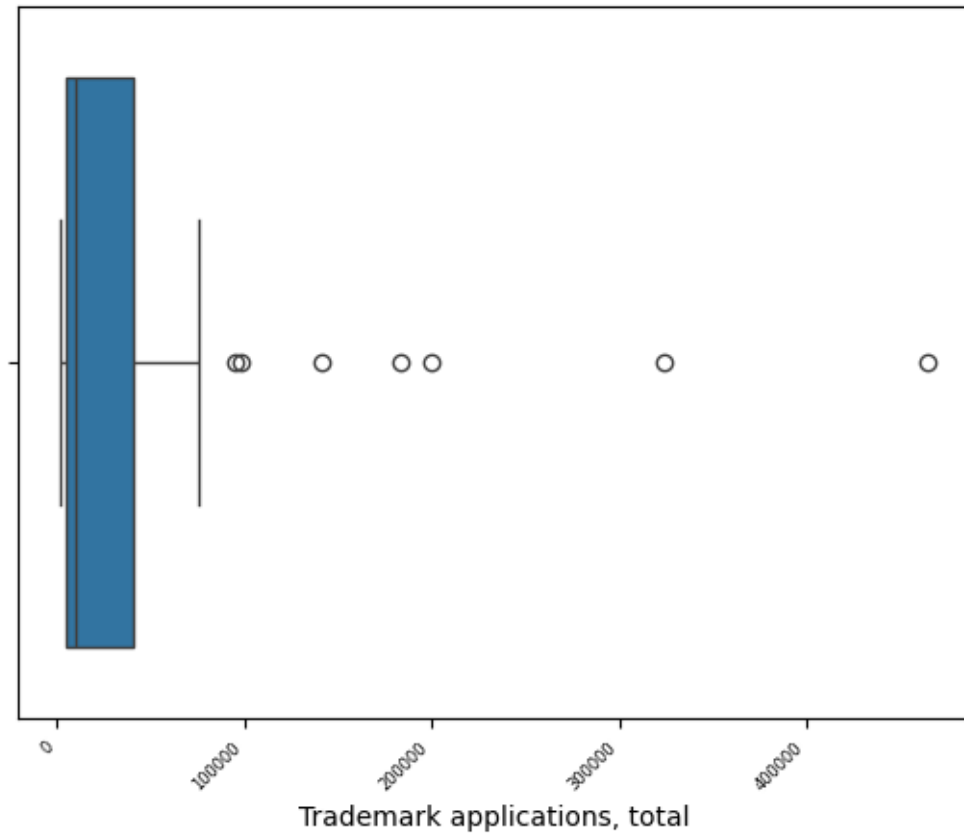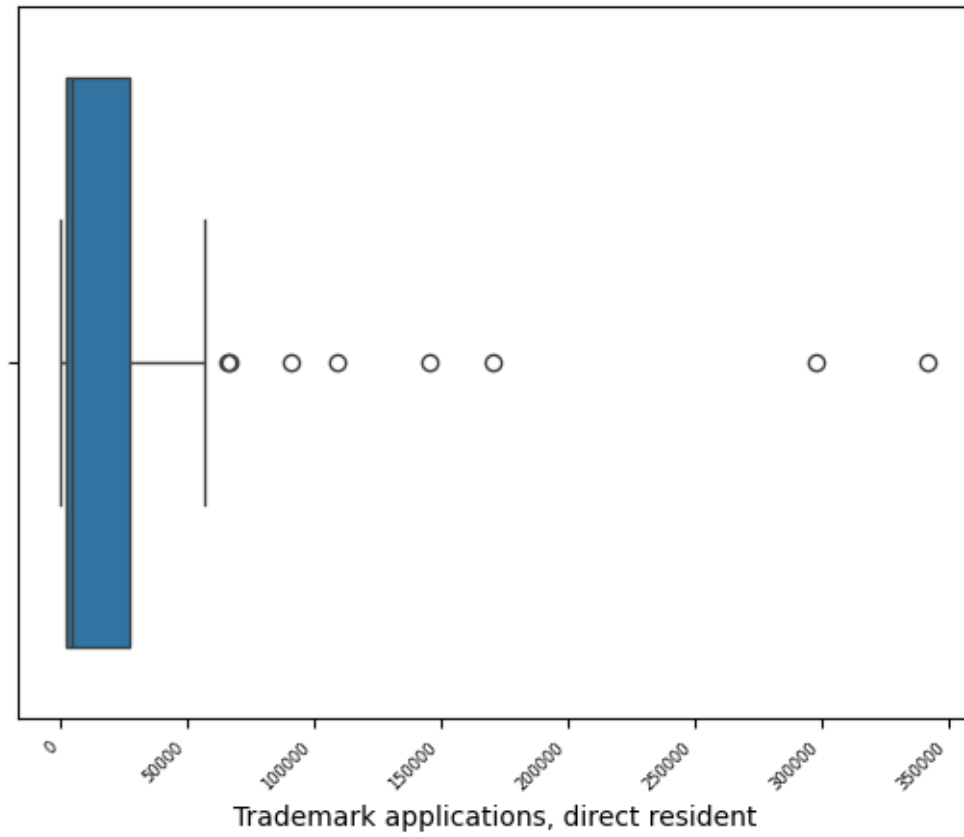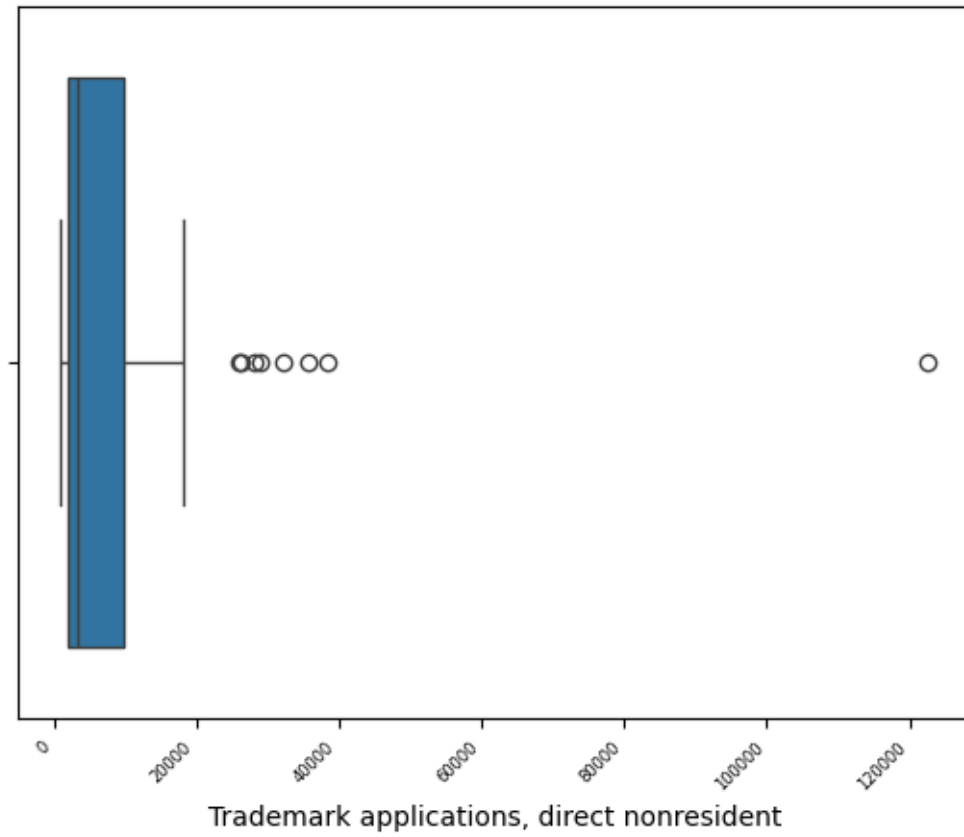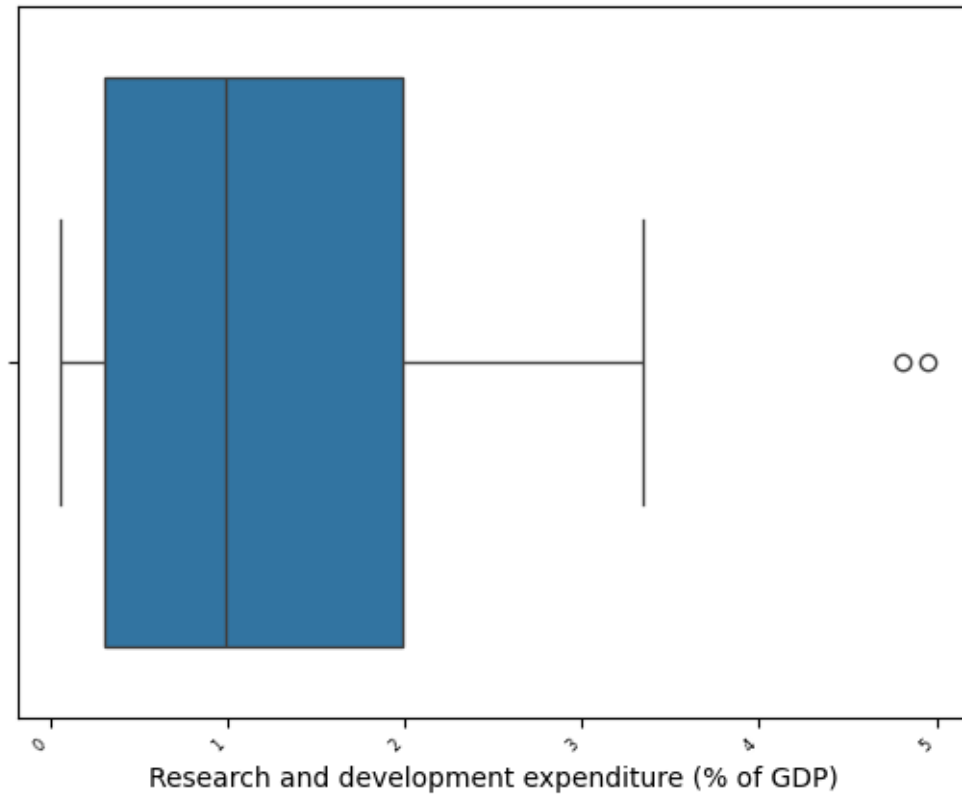
          High-technology exports (current US$)  Trademark applications, total  \
     207                    156365524736.000                            464786.000

          Trademark applications, direct resident  \
     207                               342150.000

          Trademark applications, direct nonresident  \
     207                                  122636.000
```

```
     Patent applications, residents  Patent applications, nonresidents  \
207                       285095.000                               312046.000

     Scientific and technical journal articles  \
207                                 422807.710

     Research and development expenditure (% of GDP)
207                                           2.838
```

```python
st_data_2018_clean[st_data_2018_clean["Scientific and technical journal␣
 ↪articles"] > 60000]
```

```
           Country Name  High-technology exports (% of manufactured exports)  \
68               France                                               25.920
73              Germany                                               15.778
89                India                                                9.008
96                Italy                                                7.505
98                Japan                                               17.268
104          Korea, Rep.                                              36.347
161  Russian Federation                                               10.963
206      United Kingdom                                               22.643
207       United States                                               18.896

     High-technology exports (current US$)  Trademark applications, total  \
68                    117814412441.000                            98279.000
73                    210082307180.000                            75236.000
89                     20273090235.000                           323970.000
96                     32581025234.000                            42580.000
98                    111020443595.000                           183657.000
104                   192789656676.000                           199476.000
161                    10183007833.000                            75081.000
206                    76926541023.000                            94915.000
207                   156365524736.000                           464786.000

     Trademark applications, direct resident  \
68                                  90581.000
73                                  65686.000
89                                 297750.000
96                                  37320.000
98                                 145269.000
104                                170541.000
161                                 49132.000
206                                 66833.000
207                                342150.000

     Trademark applications, direct nonresident  \
68                                      7698.000
```

```
73                                   9550.000
89                                  26220.000
96                                   5260.000
98                                  38388.000
104                                 28935.000
161                                 25949.000
206                                 28082.000
207                                122636.000

        Patent applications, residents  Patent applications, nonresidents  \
68                          14303.000                               1919.000
73                          46617.000                              21281.000
89                          16289.000                              33766.000
96                           8921.000                                900.000
98                         253630.000                              59937.000
104                        162561.000                              47431.000
161                         24926.000                              13031.000
206                         12865.000                               8076.000
207                        285095.000                             312046.000

        Scientific and technical journal articles  \
68                                       66352.180
73                                      104396.120
89                                      135787.790
96                                       71240.280
98                                       98792.500
104                                      66376.170
161                                      81579.360
206                                      97680.900
207                                     422807.710

        Research and development expenditure (% of GDP)
68                                                2.200
73                                                3.094
89                                                0.650
96                                                1.399
98                                                3.265
104                                               4.810
161                                               0.990
206                                               1.724
207                                               2.838
```

```python
columns = st_data_2009_clean.columns

for col in columns:
  sns.boxplot(x=st_data_2009_clean[col])
  plt.xticks(rotation=45, ha='right', fontsize=6)  # Added fontsize=8
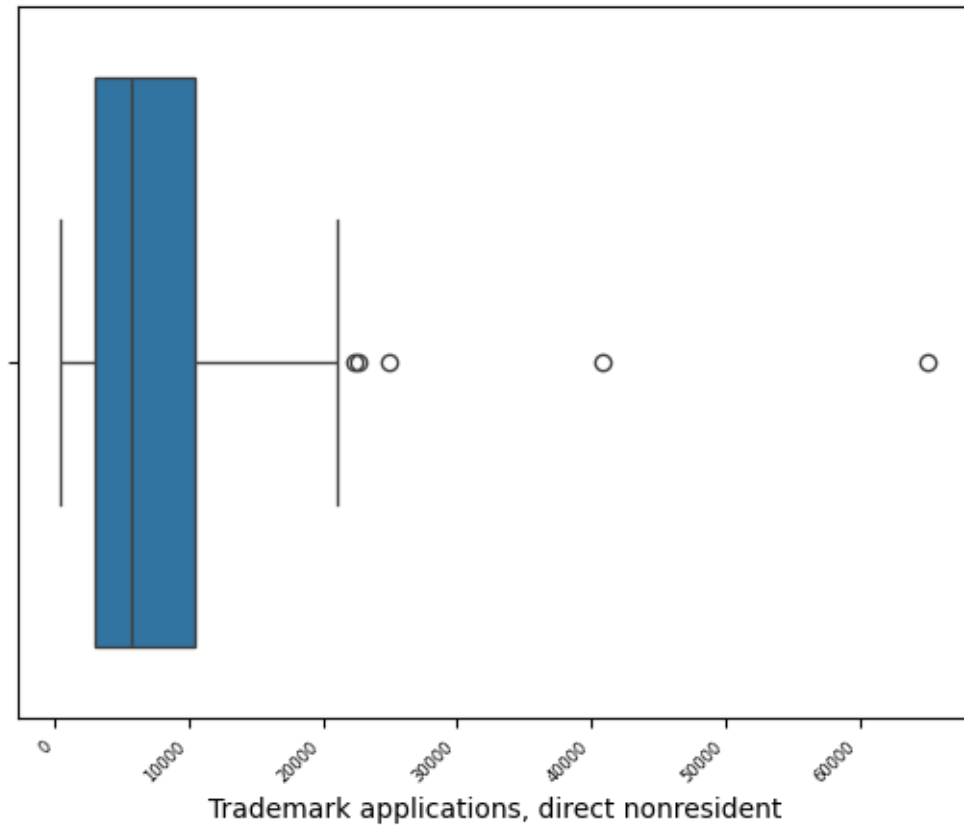```

```
plt.show()
```


Country Name

High-technology exports (% of manufactured exports)

High-technology exports (current US$)

1e11

Trademark applications, total

Trademark applications, direct resident

Trademark applications, direct nonresident

Patent applications, residents

Patent applications, nonresidents

Scientific and technical journal articles

Research and development expenditure (% of GDP)
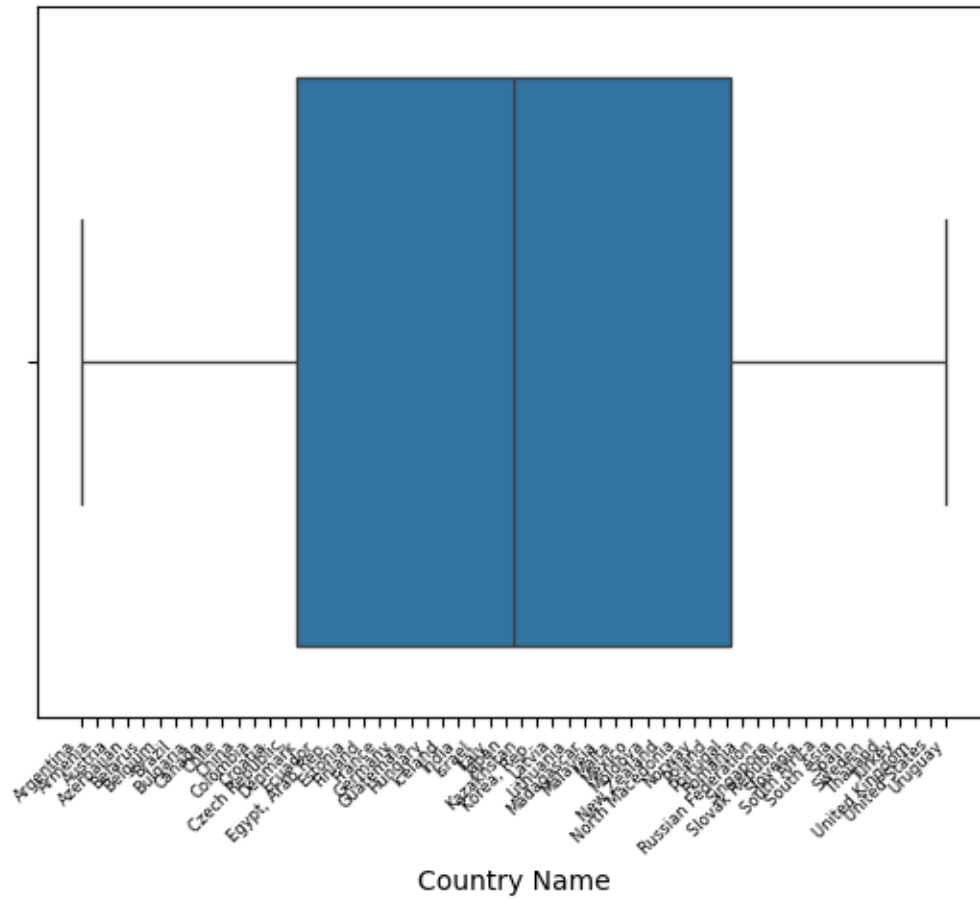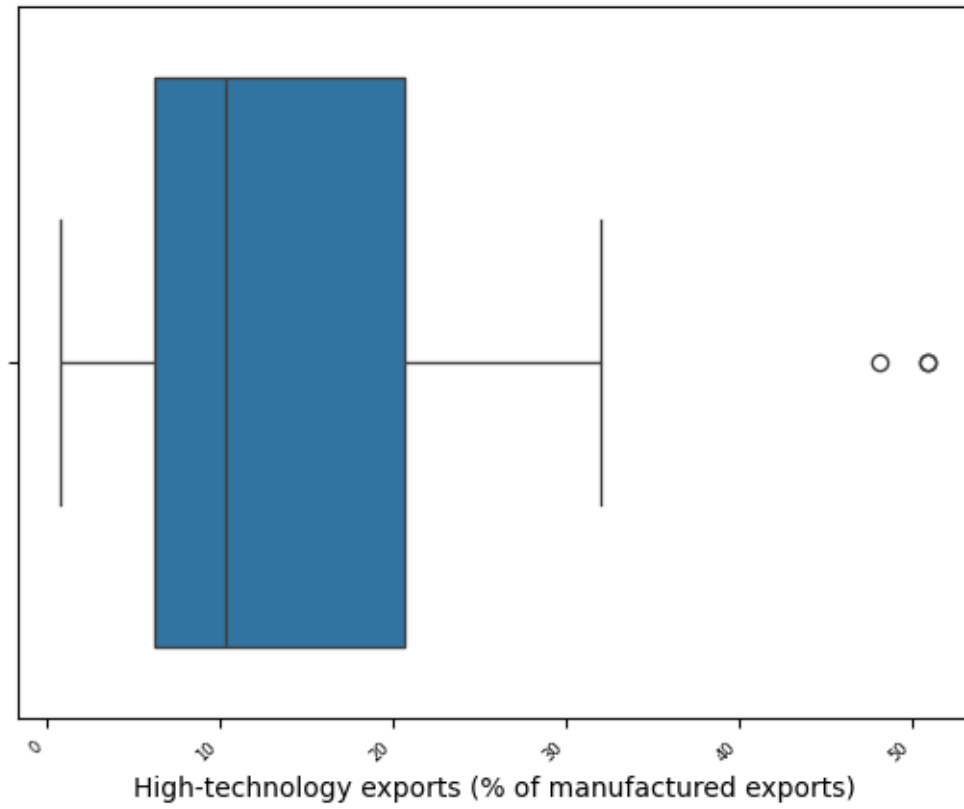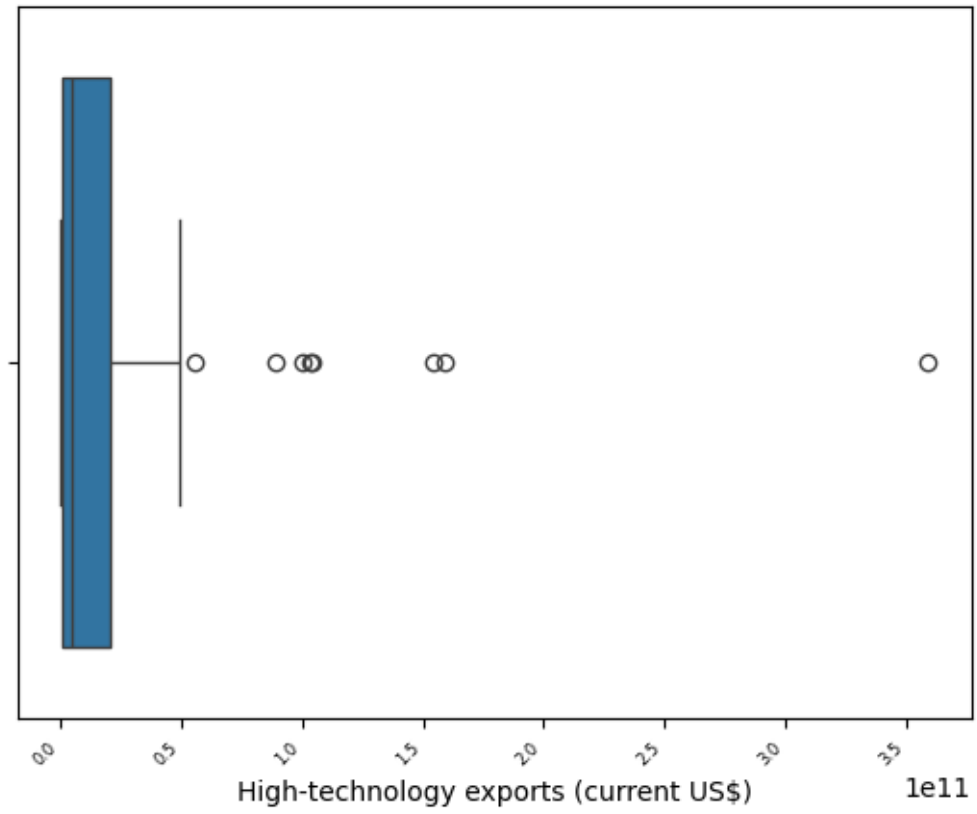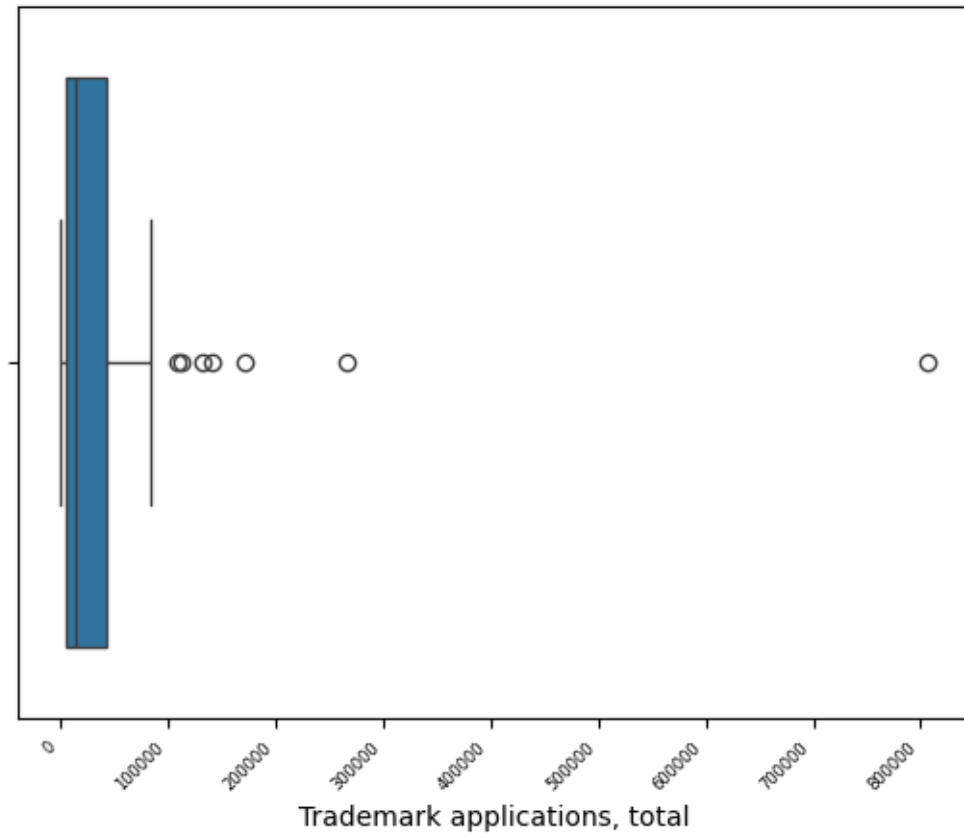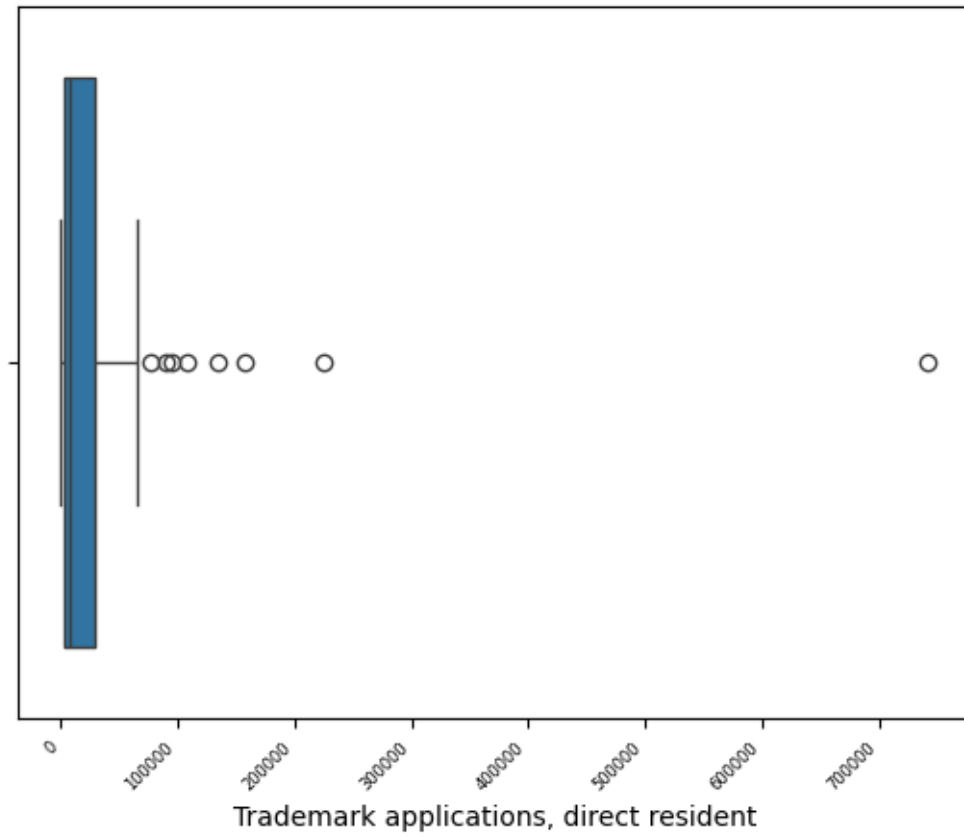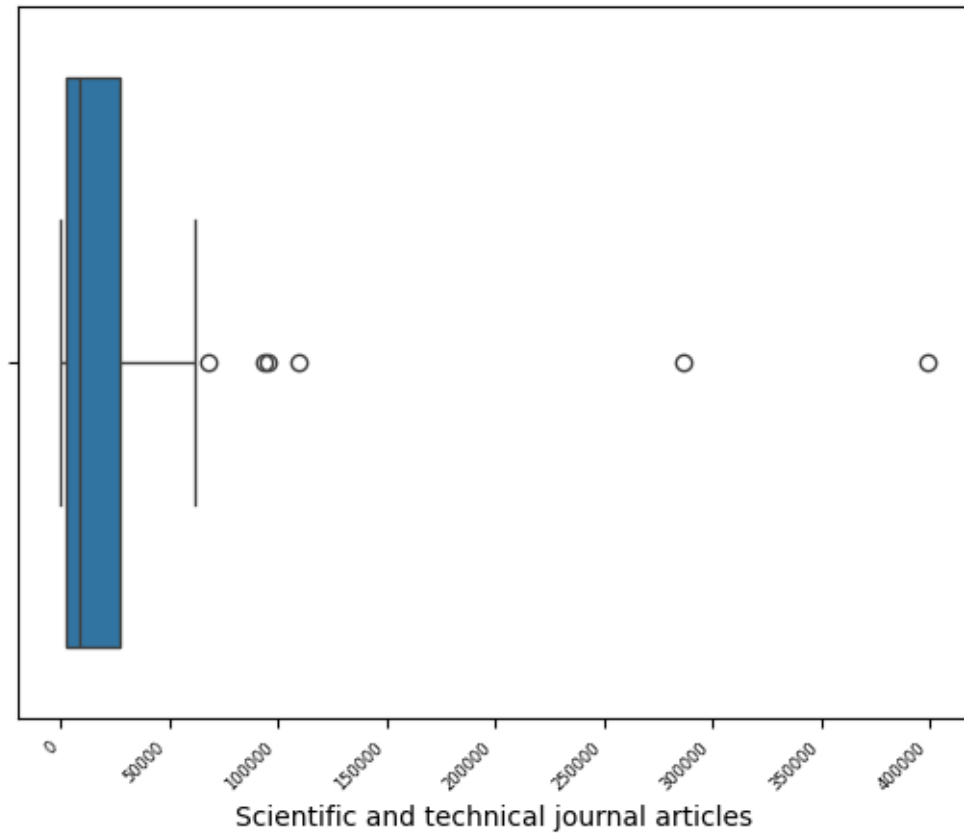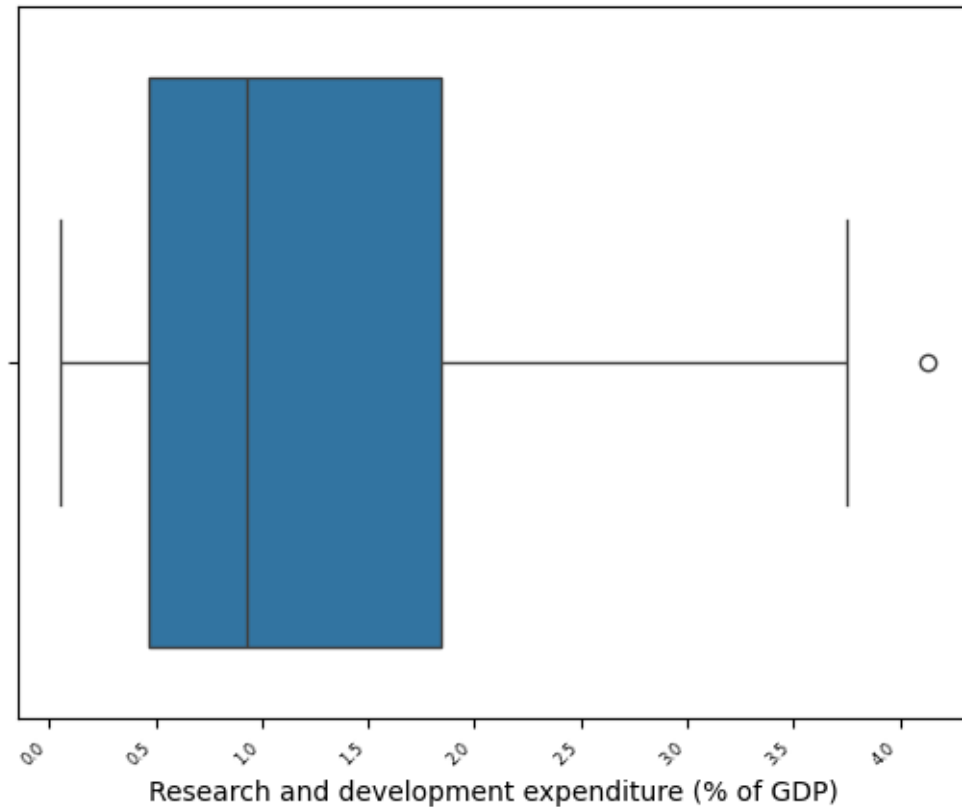
```
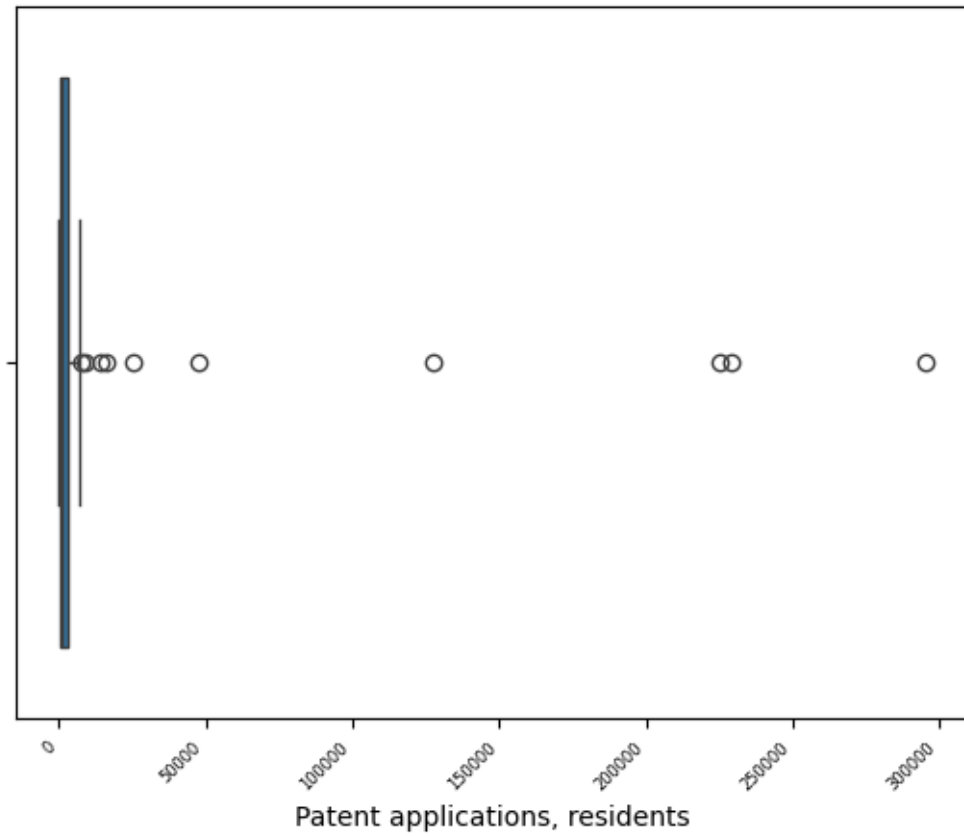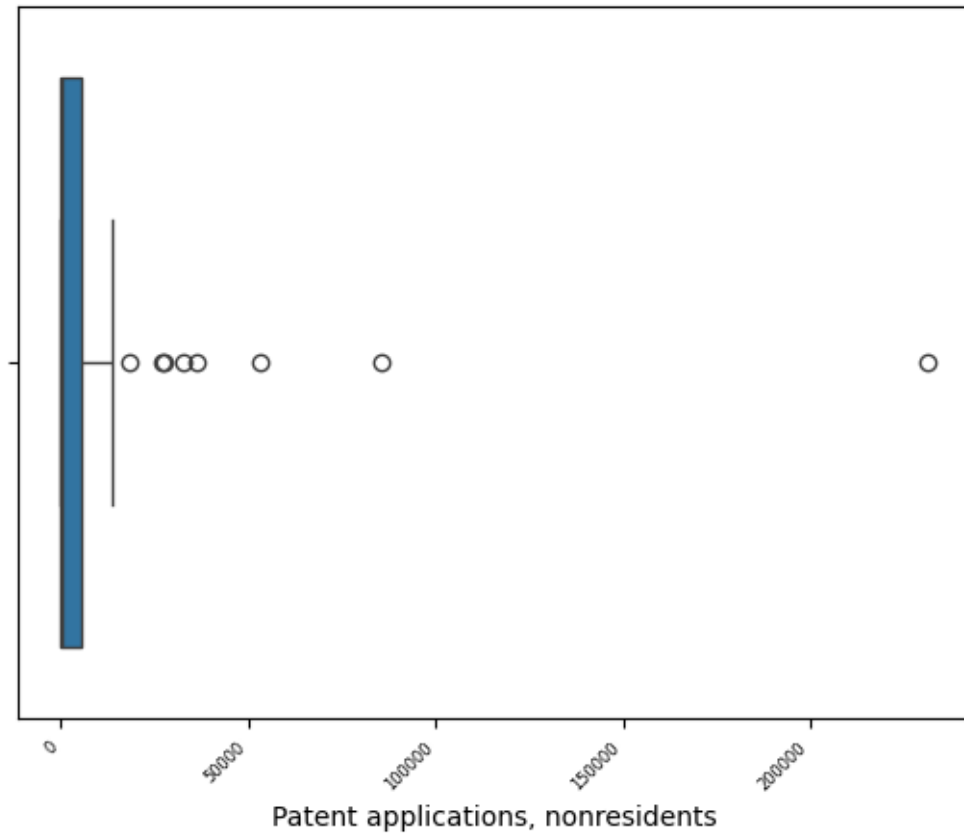[ ]: article_max = st_data_2009_clean["Scientific and technical journal articles"].
     ↪max()
     article_max
```

```
[ ]: 399350.31
```

```
[ ]: st_data_2009_clean[st_data_2009_clean["Scientific and technical journal␣
     ↪articles"] == article_max]
```

```
[ ]:        Country Name  High-technology exports (% of manufactured exports)  \
     207   United States                                                25.010

          High-technology exports (current US$)  Trademark applications, total  \
     207                    154108484413.000                         265943.000

          Trademark applications, direct resident  \
     207                                 225045.000

          Trademark applications, direct nonresident  \
     207                                    40898.000
```

```
     Patent applications, residents  Patent applications, nonresidents  \
207                    224912.000                              231194.000


     Scientific and technical journal articles  \
207                              399350.310


     Research and development expenditure (% of GDP)
207                                            2.813
```

```
st_data_2009_clean[st_data_2009_clean["Scientific and technical journal␣
 ↪articles"] > 60000]
```

```
        Country Name  High-technology exports (% of manufactured exports)  \
41            China                                               31.952
68           France                                               24.380
73          Germany                                               16.882
98            Japan                                               20.586
178       South Asia                                               8.310
206  United Kingdom                                               20.804
207   United States                                               25.010


     High-technology exports (current US$)  Trademark applications, total  \
41                    359273932009.000                        806906.000
68                     88872522741.000                         83901.000
73                    159207939862.000                         74370.000
98                    104428943952.000                        109614.000
178                    11674908636.000                        171910.000
206                    49442450948.000                         33846.000
207                   154108484413.000                        265943.000


     Trademark applications, direct resident  \
41                                741785.000
68                                 76540.000
73                                 65723.000
98                                 90473.000
178                               157299.000
206                                25182.000
207                               225045.000


     Trademark applications, direct nonresident  \
41                                     65121.000
68                                      7361.000
73                                      8647.000
98                                     19141.000
178                                    14611.000
206                                     8664.000
207                                    40898.000
```

```
     Patent applications, residents  Patent applications, nonresidents  \
41                       229096.000                              85508.000
68                        14100.000                               1593.000
73                        47859.000                              11724.000
98                       295315.000                              53281.000
178                        7519.000                              27500.000
206                       15985.000                               6480.000
207                      224912.000                             231194.000

     Scientific and technical journal articles  \
41                                   286371.910
68                                    68273.770
73                                    95453.200
98                                   109131.250
178                                   61863.100
206                                   93803.370
207                                  399350.310

     Research and development expenditure (% of GDP)
41                                             1.665
68                                             2.212
73                                             2.726
98                                             3.231
178                                            0.786
206                                            1.683
207                                            2.813
```

```python
# Subset for 2009 data with articles > 60000
df_2009_high_articles = st_data_2009_clean[st_data_2009_clean["Scientific and
 ↪technical journal articles"] > 60000]

# Subset for 2018 data with articles > 60000
df_2018_high_articles = st_data_2018_clean[st_data_2018_clean["Scientific and
 ↪technical journal articles"] > 60000]
```

```python
# Merge the two subsets on 'Country Name'
merged_df = pd.merge(df_2009_high_articles, df_2018_high_articles, on='Country
 ↪Name', suffixes=('_2009', '_2018'))
```

```python
# Calculate the difference between 2018 and 2009 for all columns
for col in df_2009_high_articles.columns:
    if col != 'Country Name':  # Exclude 'Country Name' from difference
 ↪calculation
        merged_df[col + '_diff'] = merged_df[col + '_2018'] - merged_df[col +
 ↪'_2009']
```

```python
# Sort by the absolute difference in 'Scientific and technical journal articles'
# and display the top countries
top_countries = merged_df.sort_values(by=['Scientific and technical journal␣
 ↪articles_diff'], ascending=False)

# Display the top countries with the differences
top_countries[['Country Name'] + [col for col in merged_df.columns if '_diff'␣
 ↪in col]]
```

```
       Country Name  High-technology exports (% of manufactured exports)_diff  \
4     United States                                               -6.114
1           Germany                                               -1.104
3    United Kingdom                                                1.840
0            France                                                1.540
2             Japan                                               -3.318

    High-technology exports (current US$)_diff  \
4                           2257040323.000
1                          50874367318.000
3                          27484090075.000
0                          28941889700.000
2                           6591499643.000

    Trademark applications, total_diff  \
4                          198843.000
1                             866.000
3                           61069.000
0                           14378.000
2                           74043.000

    Trademark applications, direct resident_diff  \
4                                117105.000
1                                   -37.000
3                                 41651.000
0                                 14041.000
2                                 54796.000

    Trademark applications, direct nonresident_diff  \
4                                   81738.000
1                                     903.000
3                                   19418.000
0                                     337.000
2                                   19247.000

    Patent applications, residents_diff  \
4                           60183.000
1                           -1242.000
```

33

```
3                             -3120.000
0                               203.000
2                            -41685.000

    Patent applications, nonresidents_diff  \
4                             80852.000
1                              9557.000
3                              1596.000
0                               326.000
2                              6656.000

    Scientific and technical journal articles_diff  \
4                              23457.400
1                               8942.920
3                               3877.530
0                              -1921.590
2                             -10338.750

    Research and development expenditure (% of GDP)_diff
4                                0.025
1                                0.368
3                                0.042
0                               -0.012
2                                0.033
```

```python
# Select the top N countries for the bar chart (e.g., top 10)
top_n = 10  # Adjust as needed
top_countries_chart = top_countries.head(top_n)

# Create the bar chart using Seaborn
plt.figure(figsize=(12, 6))
sns.barplot(x='Country Name', y='Scientific and technical journal
 ↪articles_diff',
            hue='Country Name', data=top_countries_chart, palette='viridis',
 ↪legend=False)
plt.xlabel("Country Name")
plt.ylabel("Change in Scientific and technical journal articles")
plt.title("Top {} Countries with Most Significant Increase in Articles
 ↪(2009-2018)".format(top_n))
plt.xticks(rotation=45, ha='right')
plt.tight_layout()
plt.show();
```

Top 10 Countries with Most Significant Increase in Articles (2009-2018)
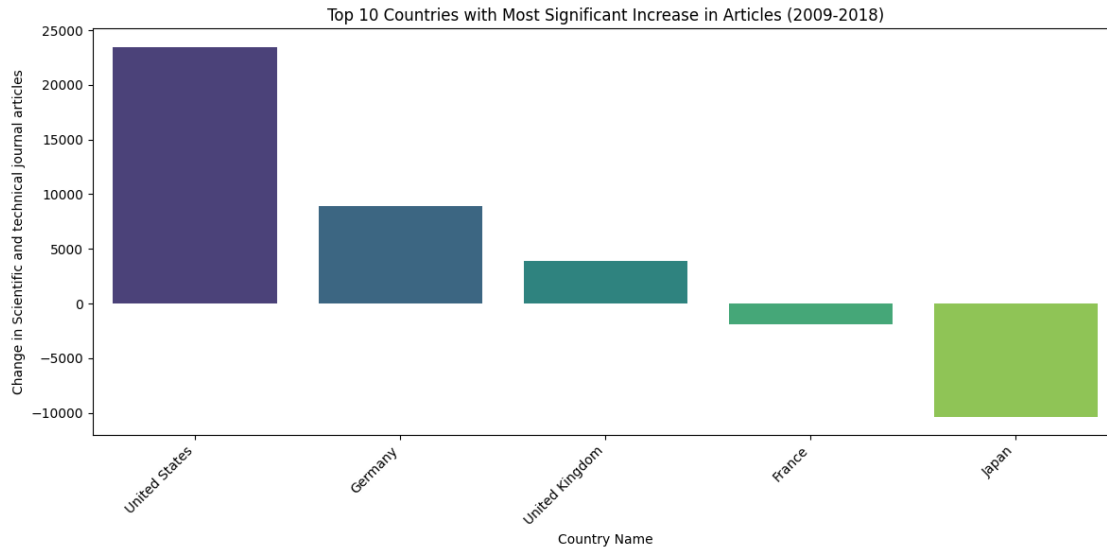
#Exploring Relationships

#Correlations

```
[ ]: st_data_2018_clean.select_dtypes(include=np.number).corr(method='pearson').
     ↪style.background_gradient(cmap='coolwarm')
```

```
[ ]: <pandas.io.formats.style.Styler at 0x7eeb7baa0b80>
```

```
[ ]: st_data_2018_clean.select_dtypes(include=np.number).corr(method='spearman').
     ↪style.background_gradient(cmap='coolwarm')
```

```
[ ]: <pandas.io.formats.style.Styler at 0x7eeb7bc273d0>
```

```
[ ]: st_data_2018_clean.plot(kind='scatter', x='High-technology exports (% of␣
     ↪manufactured exports)', y='Scientific and technical journal articles',␣
     ↪alpha=0.5);
```
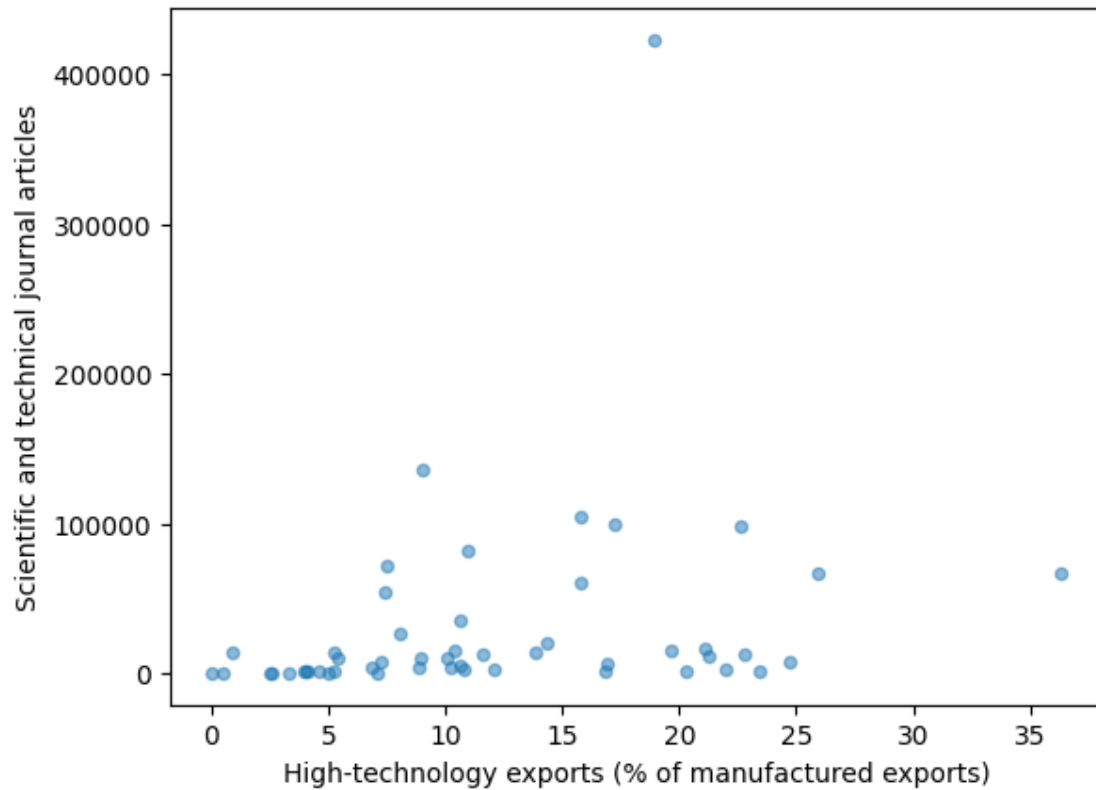
US is an outlier, so lets remove US from the equation to get a closer look.

```
[ ]: st_data_2018_nonUS = st_data_2018_clean[st_data_2018_clean["Country Name"] !=␣
     ↪"United States"]
     st_data_2018_nonUS.plot(kind='scatter', x='High-technology exports (% of␣
     ↪manufactured exports)', y='Scientific and technical journal articles',␣
     ↪alpha=0.5);
```
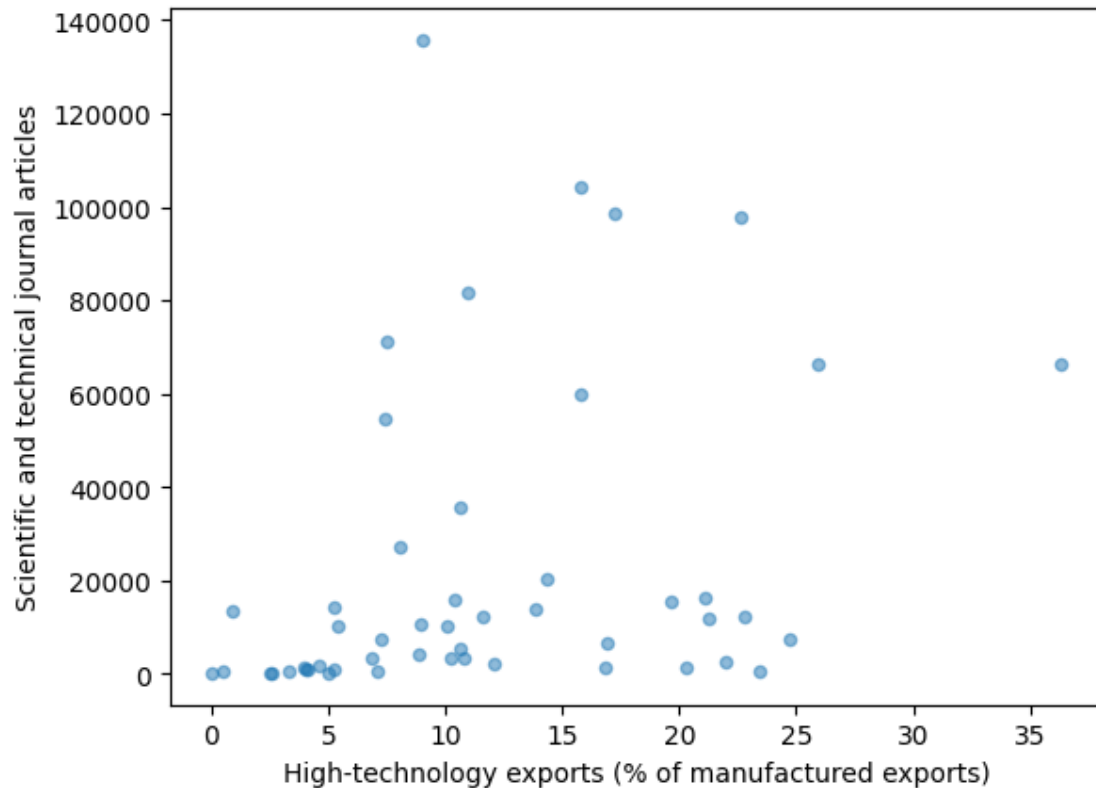
```
[ ]: st_data_2009_clean.select_dtypes(include=np.number).corr(method='pearson').
     ↪style.background_gradient(cmap='coolwarm')
```

```
[ ]: <pandas.io.formats.style.Styler at 0x7eeb7cf91c00>
```

```
[ ]: st_data_2009_clean.select_dtypes(include=np.number).corr(method='spearman').
     ↪style.background_gradient(cmap='coolwarm')
```

```
[ ]: <pandas.io.formats.style.Styler at 0x7eeb7d063340>
```

```
[ ]: st_data_2018_clean.plot(kind='scatter', x='High-technology exports (% of␣
     ↪manufactured exports)', y='Scientific and technical journal articles',␣
     ↪alpha=0.5);
```
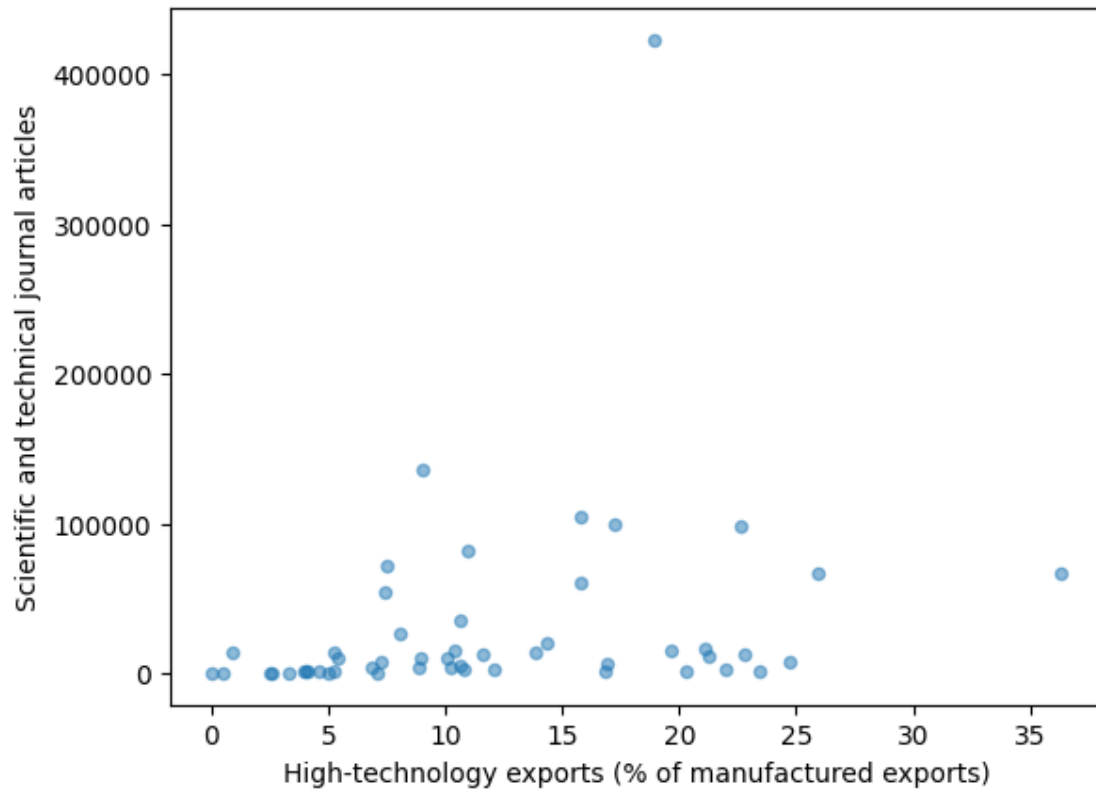
```
[ ]: st_data_2018_nonUS = st_data_2018_clean[st_data_2018_clean["Country Name"] !=␣
     ↪"United States"]
     st_data_2018_nonUS.plot(kind='scatter', x='High-technology exports (% of␣
     ↪manufactured exports)', y='Scientific and technical journal articles',␣
     ↪alpha=0.5);
```
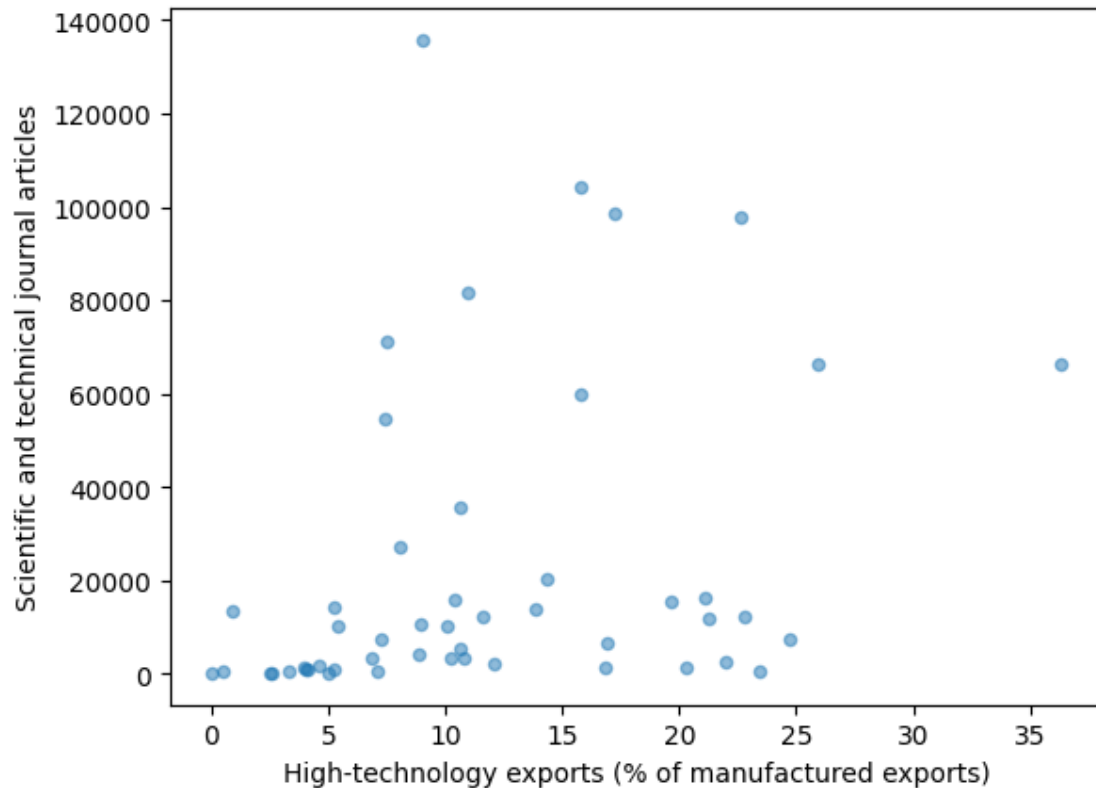
0.4 T-Tests

```
[ ]: import scipy.stats as stats
```

```
[ ]: stats.ttest_ind(st_data_2018_clean["High-technology exports (% of manufactured␣
     ↪exports)"], st_data_2009_clean["High-technology exports (% of manufactured␣
     ↪exports)"])
```

```
[ ]: TtestResult(statistic=-1.5178124850425097, pvalue=0.13206686889029143, df=105.0)
```

```
[ ]: # Create an empty list to store the results
     results = []

     # Iterate through the columns and perform t-tests
     for i in range(1, len(columns)):
         col_name = columns[i]
         a = st_data_2018_clean[col_name]
         b = st_data_2009_clean[col_name]
         t_stat, p_value = stats.ttest_ind(a, b)  # Get t-statistic and p-value

         # Append the results to the list
```

```
    results.append([col_name, t_stat, p_value])

# Create a pandas DataFrame from the results list
results_df = pd.DataFrame(results, columns=['Variable', 'T-Statistic',␣
 ↪'P-Value'])

# Display the DataFrame as a table
display(results_df)
```

```
                                      Variable  T-Statistic  P-Value
0  High-technology exports (% of manufactured exp…      -1.518    0.132
1              High-technology exports (current US$)      -0.123    0.903
2                    Trademark applications, total      -0.270    0.787
3          Trademark applications, direct resident      -0.388    0.699
4       Trademark applications, direct nonresident       0.486    0.628
5                Patent applications, residents      -0.171    0.865
6             Patent applications, nonresidents       0.045    0.964
7           Scientific and technical journal articles       0.006    0.995
8     Research and development expenditure (% of GDP)       0.280    0.780
```

[1]: ```
!sudo apt-get update
!sudo apt-get install texlive-xetex pandoc
```

```
 0% [Working]                    Hit:1 http://archive.ubuntu.com/ubuntu jammy
InRelease
 0% [Connecting to security.ubuntu.com (185.125.190.82)] [Connected to cloud.r-p
Get:2 http://archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Get:3 https://cloud.r-project.org/bin/linux/ubuntu jammy-cran40/ InRelease
[3,632 B]
Get:4 https://developer.download.nvidia.com/compute/cuda/repos/ubuntu2204/x86_64
InRelease [1,581 B]
Get:5 http://archive.ubuntu.com/ubuntu jammy-backports InRelease [127 kB]
Get:6 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Get:7 https://r2u.stat.illinois.edu/ubuntu jammy InRelease [6,555 B]
Hit:8 https://ppa.launchpadcontent.net/deadsnakes/ppa/ubuntu jammy InRelease
Get:9 https://cloud.r-project.org/bin/linux/ubuntu jammy-cran40/ Packages [69.9
kB]
Hit:10 https://ppa.launchpadcontent.net/graphics-drivers/ppa/ubuntu jammy
InRelease
Get:11 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [3,000
kB]
Hit:12 https://ppa.launchpadcontent.net/ubuntugis/ppa/ubuntu jammy InRelease
Get:13
https://developer.download.nvidia.com/compute/cuda/repos/ubuntu2204/x86_64
Packages [1,378 kB]
Get:14 http://archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages
[1,535 kB]
```

```
Get:15 https://r2u.stat.illinois.edu/ubuntu jammy/main amd64 Packages [2,675 kB]
Get:16 https://r2u.stat.illinois.edu/ubuntu jammy/main all Packages [8,754 kB]
Get:17 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages
[2,692 kB]
Get:18 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages
[1,236 kB]
Fetched 21.7 MB in 3s (6,802 kB/s)
Reading package lists… Done
W: Skipping acquire of configured file 'main/source/Sources' as repository
'https://r2u.stat.illinois.edu/ubuntu jammy InRelease' does not seem to provide
it (sources.list entry misspelt?)
Reading package lists… Done
Building dependency tree… Done
Reading state information… Done
The following additional packages will be installed:
  dvisvgm fonts-droid-fallback fonts-lato fonts-lmodern fonts-noto-mono
  fonts-texgyre fonts-urw-base35 libapache-pom-java
  libcmark-gfm-extensions0.29.0.gfm.3 libcmark-gfm0.29.0.gfm.3
  libcommons-logging-java libcommons-parent-java libfontbox-java libfontenc1
  libgs9 libgs9-common libidn12 libijs-0.35 libjbig2dec0 libkpathsea6
  libpdfbox-java libptexenc1 libruby3.0 libsynctex2 libteckit0 libtexlua53
  libtexluajit2 libwoff1 libzzip-0-13 lmodern pandoc-data poppler-data
  preview-latex-style rake ruby ruby-net-telnet ruby-rubygems ruby-webrick
  ruby-xmlrpc ruby3.0 rubygems-integration t1utils teckit tex-common tex-gyre
  texlive-base texlive-binaries texlive-fonts-recommended texlive-latex-base
  texlive-latex-extra texlive-latex-recommended texlive-pictures
  texlive-plain-generic tipa xfonts-encodings xfonts-utils
Suggested packages:
  fonts-noto fonts-freefont-otf | fonts-freefont-ttf libavalon-framework-java
  libcommons-logging-java-doc libexcalibur-logkit-java liblog4j1.2-java
  texlive-luatex pandoc-citeproc context wkhtmltopdf librsvg2-bin groff ghc
  nodejs php python libjs-mathjax libjs-katex citation-style-language-styles
  poppler-utils ghostscript fonts-japanese-mincho | fonts-ipafont-mincho
  fonts-japanese-gothic | fonts-ipafont-gothic fonts-arphic-ukai
  fonts-arphic-uming fonts-nanum ri ruby-dev bundler debhelper gv
  | postscript-viewer perl-tk xpdf | pdf-viewer xzdec
  texlive-fonts-recommended-doc texlive-latex-base-doc python3-pygments
  icc-profiles libfile-which-perl libspreadsheet-parseexcel-perl
  texlive-latex-extra-doc texlive-latex-recommended-doc texlive-pstricks
  dot2tex prerex texlive-pictures-doc vprerex default-jre-headless tipa-doc
The following NEW packages will be installed:
  dvisvgm fonts-droid-fallback fonts-lato fonts-lmodern fonts-noto-mono
  fonts-texgyre fonts-urw-base35 libapache-pom-java
  libcmark-gfm-extensions0.29.0.gfm.3 libcmark-gfm0.29.0.gfm.3
  libcommons-logging-java libcommons-parent-java libfontbox-java libfontenc1
  libgs9 libgs9-common libidn12 libijs-0.35 libjbig2dec0 libkpathsea6
  libpdfbox-java libptexenc1 libruby3.0 libsynctex2 libteckit0 libtexlua53
  libtexluajit2 libwoff1 libzzip-0-13 lmodern pandoc pandoc-data poppler-data
```

```
    preview-latex-style rake ruby ruby-net-telnet ruby-rubygems ruby-webrick
    ruby-xmlrpc ruby3.0 rubygems-integration t1utils teckit tex-common tex-gyre
    texlive-base texlive-binaries texlive-fonts-recommended texlive-latex-base
    texlive-latex-extra texlive-latex-recommended texlive-pictures
    texlive-plain-generic texlive-xetex tipa xfonts-encodings xfonts-utils
0 upgraded, 58 newly installed, 0 to remove and 35 not upgraded.
Need to get 202 MB of archives.
After this operation, 728 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu jammy/main amd64 fonts-droid-fallback all
1:6.0.1r16-1.1build1 [1,805 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy/main amd64 fonts-lato all 2.0-2.1
[2,696 kB]
Get:3 http://archive.ubuntu.com/ubuntu jammy/main amd64 poppler-data all
0.4.11-1 [2,171 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy/universe amd64 tex-common all 6.17
[33.7 kB]
Get:5 http://archive.ubuntu.com/ubuntu jammy/main amd64 fonts-urw-base35 all
20200910-1 [6,367 kB]
Get:6 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libgs9-common
all 9.55.0~dfsg1-0ubuntu5.10 [752 kB]
Get:7 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libidn12 amd64
1.38-4ubuntu1 [60.0 kB]
Get:8 http://archive.ubuntu.com/ubuntu jammy/main amd64 libijs-0.35 amd64
0.35-15build2 [16.5 kB]
Get:9 http://archive.ubuntu.com/ubuntu jammy/main amd64 libjbig2dec0 amd64
0.19-3build2 [64.7 kB]
Get:10 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libgs9 amd64
9.55.0~dfsg1-0ubuntu5.10 [5,031 kB]
Get:11 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libkpathsea6
amd64 2021.20210626.59705-1ubuntu0.2 [60.4 kB]
Get:12 http://archive.ubuntu.com/ubuntu jammy/main amd64 libwoff1 amd64
1.0.2-1build4 [45.2 kB]
Get:13 http://archive.ubuntu.com/ubuntu jammy/universe amd64 dvisvgm amd64
2.13.1-1 [1,221 kB]
Get:14 http://archive.ubuntu.com/ubuntu jammy/universe amd64 fonts-lmodern all
2.004.5-6.1 [4,532 kB]
Get:15 http://archive.ubuntu.com/ubuntu jammy/main amd64 fonts-noto-mono all
20201225-1build1 [397 kB]
Get:16 http://archive.ubuntu.com/ubuntu jammy/universe amd64 fonts-texgyre all
20180621-3.1 [10.2 MB]
Get:17 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libapache-pom-java
all 18-1 [4,720 B]
Get:18 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libcmark-
gfm0.29.0.gfm.3 amd64 0.29.0.gfm.3-3 [115 kB]
Get:19 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libcmark-gfm-
extensions0.29.0.gfm.3 amd64 0.29.0.gfm.3-3 [25.1 kB]
Get:20 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libcommons-parent-
java all 43-1 [10.8 kB]
```

```
Get:21 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libcommons-logging-
java all 1.2-2 [60.3 kB]
Get:22 http://archive.ubuntu.com/ubuntu jammy/main amd64 libfontenc1 amd64
1:1.1.4-1build3 [14.7 kB]
Get:23 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libptexenc1
amd64 2021.20210626.59705-1ubuntu0.2 [39.1 kB]
Get:24 http://archive.ubuntu.com/ubuntu jammy/main amd64 rubygems-integration
all 1.18 [5,336 B]
Get:25 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 ruby3.0 amd64
3.0.2-7ubuntu2.8 [50.1 kB]
Get:26 http://archive.ubuntu.com/ubuntu jammy/main amd64 ruby-rubygems all
3.3.5-2 [228 kB]
Get:27 http://archive.ubuntu.com/ubuntu jammy/main amd64 ruby amd64 1:3.0~exp1
[5,100 B]
Get:28 http://archive.ubuntu.com/ubuntu jammy/main amd64 rake all 13.0.6-2 [61.7
kB]
Get:29 http://archive.ubuntu.com/ubuntu jammy/main amd64 ruby-net-telnet all
0.1.1-2 [12.6 kB]
Get:30 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 ruby-webrick
all 1.7.0-3ubuntu0.1 [52.1 kB]
Get:31 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 ruby-xmlrpc all
0.3.2-1ubuntu0.1 [24.9 kB]
Get:32 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libruby3.0
amd64 3.0.2-7ubuntu2.8 [5,113 kB]
Get:33 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libsynctex2
amd64 2021.20210626.59705-1ubuntu0.2 [55.6 kB]
Get:34 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libteckit0 amd64
2.5.11+ds1-1 [421 kB]
Get:35 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libtexlua53
amd64 2021.20210626.59705-1ubuntu0.2 [120 kB]
Get:36 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libtexluajit2
amd64 2021.20210626.59705-1ubuntu0.2 [267 kB]
Get:37 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libzzip-0-13 amd64
0.13.72+dfsg.1-1.1 [27.0 kB]
Get:38 http://archive.ubuntu.com/ubuntu jammy/main amd64 xfonts-encodings all
1:1.0.5-0ubuntu2 [578 kB]
Get:39 http://archive.ubuntu.com/ubuntu jammy/main amd64 xfonts-utils amd64
1:7.7+6build2 [94.6 kB]
Get:40 http://archive.ubuntu.com/ubuntu jammy/universe amd64 lmodern all
2.004.5-6.1 [9,471 kB]
Get:41 http://archive.ubuntu.com/ubuntu jammy/universe amd64 pandoc-data all
2.9.2.1-3ubuntu2 [81.8 kB]
Get:42 http://archive.ubuntu.com/ubuntu jammy/universe amd64 pandoc amd64
2.9.2.1-3ubuntu2 [20.3 MB]
Get:43 http://archive.ubuntu.com/ubuntu jammy/universe amd64 preview-latex-style
all 12.2-1ubuntu1 [185 kB]
Get:44 http://archive.ubuntu.com/ubuntu jammy/main amd64 t1utils amd64
1.41-4build2 [61.3 kB]
```

```
Get:45 http://archive.ubuntu.com/ubuntu jammy/universe amd64 teckit amd64
2.5.11+ds1-1 [699 kB]
Get:46 http://archive.ubuntu.com/ubuntu jammy/universe amd64 tex-gyre all
20180621-3.1 [6,209 kB]
Get:47 http://archive.ubuntu.com/ubuntu jammy-updates/universe amd64 texlive-
binaries amd64 2021.20210626.59705-1ubuntu0.2 [9,860 kB]
Get:48 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-base all
2021.20220204-1 [21.0 MB]
Get:49 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-fonts-
recommended all 2021.20220204-1 [4,972 kB]
Get:50 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-latex-base
all 2021.20220204-1 [1,128 kB]
Get:51 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libfontbox-java all
1:1.8.16-2 [207 kB]
Get:52 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libpdfbox-java all
1:1.8.16-2 [5,199 kB]
Get:53 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-latex-
recommended all 2021.20220204-1 [14.4 MB]
Get:54 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-pictures
all 2021.20220204-1 [8,720 kB]
Get:55 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-latex-extra
all 2021.20220204-1 [13.9 MB]
Get:56 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-plain-
generic all 2021.20220204-1 [27.5 MB]
Get:57 http://archive.ubuntu.com/ubuntu jammy/universe amd64 tipa all 2:1.3-21
[2,967 kB]
Get:58 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-xetex all
2021.20220204-1 [12.4 MB]
Fetched 202 MB in 3s (73.9 MB/s)
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based
frontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line 78,
<> line 58.)
debconf: falling back to frontend: Readline
debconf: unable to initialize frontend: Readline
debconf: (This frontend requires a controlling tty.)
debconf: falling back to frontend: Teletype
dpkg-preconfigure: unable to re-open stdin:
Selecting previously unselected package fonts-droid-fallback.
(Reading database … 125044 files and directories currently installed.)
Preparing to unpack …/00-fonts-droid-fallback_1%3a6.0.1r16-1.1build1_all.deb
…
Unpacking fonts-droid-fallback (1:6.0.1r16-1.1build1) …
Selecting previously unselected package fonts-lato.
Preparing to unpack …/01-fonts-lato_2.0-2.1_all.deb …
Unpacking fonts-lato (2.0-2.1) …
Selecting previously unselected package poppler-data.
Preparing to unpack …/02-poppler-data_0.4.11-1_all.deb …
```

```
Unpacking poppler-data (0.4.11-1) …
Selecting previously unselected package tex-common.
Preparing to unpack …/03-tex-common_6.17_all.deb …
Unpacking tex-common (6.17) …
Selecting previously unselected package fonts-urw-base35.
Preparing to unpack …/04-fonts-urw-base35_20200910-1_all.deb …
Unpacking fonts-urw-base35 (20200910-1) …
Selecting previously unselected package libgs9-common.
Preparing to unpack …/05-libgs9-common_9.55.0~dfsg1-0ubuntu5.10_all.deb …
Unpacking libgs9-common (9.55.0~dfsg1-0ubuntu5.10) …
Selecting previously unselected package libidn12:amd64.
Preparing to unpack …/06-libidn12_1.38-4ubuntu1_amd64.deb …
Unpacking libidn12:amd64 (1.38-4ubuntu1) …
Selecting previously unselected package libijs-0.35:amd64.
Preparing to unpack …/07-libijs-0.35_0.35-15build2_amd64.deb …
Unpacking libijs-0.35:amd64 (0.35-15build2) …
Selecting previously unselected package libjbig2dec0:amd64.
Preparing to unpack …/08-libjbig2dec0_0.19-3build2_amd64.deb …
Unpacking libjbig2dec0:amd64 (0.19-3build2) …
Selecting previously unselected package libgs9:amd64.
Preparing to unpack …/09-libgs9_9.55.0~dfsg1-0ubuntu5.10_amd64.deb …
Unpacking libgs9:amd64 (9.55.0~dfsg1-0ubuntu5.10) …
Selecting previously unselected package libkpathsea6:amd64.
Preparing to unpack …/10-libkpathsea6_2021.20210626.59705-1ubuntu0.2_amd64.deb
…
Unpacking libkpathsea6:amd64 (2021.20210626.59705-1ubuntu0.2) …
Selecting previously unselected package libwoff1:amd64.
Preparing to unpack …/11-libwoff1_1.0.2-1build4_amd64.deb …
Unpacking libwoff1:amd64 (1.0.2-1build4) …
Selecting previously unselected package dvisvgm.
Preparing to unpack …/12-dvisvgm_2.13.1-1_amd64.deb …
Unpacking dvisvgm (2.13.1-1) …
Selecting previously unselected package fonts-lmodern.
Preparing to unpack …/13-fonts-lmodern_2.004.5-6.1_all.deb …
Unpacking fonts-lmodern (2.004.5-6.1) …
Selecting previously unselected package fonts-noto-mono.
Preparing to unpack …/14-fonts-noto-mono_20201225-1build1_all.deb …
Unpacking fonts-noto-mono (20201225-1build1) …
Selecting previously unselected package fonts-texgyre.
Preparing to unpack …/15-fonts-texgyre_20180621-3.1_all.deb …
Unpacking fonts-texgyre (20180621-3.1) …
Selecting previously unselected package libapache-pom-java.
Preparing to unpack …/16-libapache-pom-java_18-1_all.deb …
Unpacking libapache-pom-java (18-1) …
Selecting previously unselected package libcmark-gfm0.29.0.gfm.3:amd64.
Preparing to unpack …/17-libcmark-gfm0.29.0.gfm.3_0.29.0.gfm.3-3_amd64.deb …
Unpacking libcmark-gfm0.29.0.gfm.3:amd64 (0.29.0.gfm.3-3) …
Selecting previously unselected package libcmark-gfm-
```

```
extensions0.29.0.gfm.3:amd64.
Preparing to unpack …/18-libcmark-gfm-
extensions0.29.0.gfm.3_0.29.0.gfm.3-3_amd64.deb …
Unpacking libcmark-gfm-extensions0.29.0.gfm.3:amd64 (0.29.0.gfm.3-3) …
Selecting previously unselected package libcommons-parent-java.
Preparing to unpack …/19-libcommons-parent-java_43-1_all.deb …
Unpacking libcommons-parent-java (43-1) …
Selecting previously unselected package libcommons-logging-java.
Preparing to unpack …/20-libcommons-logging-java_1.2-2_all.deb …
Unpacking libcommons-logging-java (1.2-2) …
Selecting previously unselected package libfontenc1:amd64.
Preparing to unpack …/21-libfontenc1_1%3a1.1.4-1build3_amd64.deb …
Unpacking libfontenc1:amd64 (1:1.1.4-1build3) …
Selecting previously unselected package libptexenc1:amd64.
Preparing to unpack …/22-libptexenc1_2021.20210626.59705-1ubuntu0.2_amd64.deb
…
Unpacking libptexenc1:amd64 (2021.20210626.59705-1ubuntu0.2) …
Selecting previously unselected package rubygems-integration.
Preparing to unpack …/23-rubygems-integration_1.18_all.deb …
Unpacking rubygems-integration (1.18) …
Selecting previously unselected package ruby3.0.
Preparing to unpack …/24-ruby3.0_3.0.2-7ubuntu2.8_amd64.deb …
Unpacking ruby3.0 (3.0.2-7ubuntu2.8) …
Selecting previously unselected package ruby-rubygems.
Preparing to unpack …/25-ruby-rubygems_3.3.5-2_all.deb …
Unpacking ruby-rubygems (3.3.5-2) …
Selecting previously unselected package ruby.
Preparing to unpack …/26-ruby_1%3a3.0~exp1_amd64.deb …
Unpacking ruby (1:3.0~exp1) …
Selecting previously unselected package rake.
Preparing to unpack …/27-rake_13.0.6-2_all.deb …
Unpacking rake (13.0.6-2) …
Selecting previously unselected package ruby-net-telnet.
Preparing to unpack …/28-ruby-net-telnet_0.1.1-2_all.deb …
Unpacking ruby-net-telnet (0.1.1-2) …
Selecting previously unselected package ruby-webrick.
Preparing to unpack …/29-ruby-webrick_1.7.0-3ubuntu0.1_all.deb …
Unpacking ruby-webrick (1.7.0-3ubuntu0.1) …
Selecting previously unselected package ruby-xmlrpc.
Preparing to unpack …/30-ruby-xmlrpc_0.3.2-1ubuntu0.1_all.deb …
Unpacking ruby-xmlrpc (0.3.2-1ubuntu0.1) …
Selecting previously unselected package libruby3.0:amd64.
Preparing to unpack …/31-libruby3.0_3.0.2-7ubuntu2.8_amd64.deb …
Unpacking libruby3.0:amd64 (3.0.2-7ubuntu2.8) …
Selecting previously unselected package libsynctex2:amd64.
Preparing to unpack …/32-libsynctex2_2021.20210626.59705-1ubuntu0.2_amd64.deb
…
Unpacking libsynctex2:amd64 (2021.20210626.59705-1ubuntu0.2) …
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Selecting previously unselected package libteckit0:amd64.
Preparing to unpack …/33-libteckit0_2.5.11+ds1-1_amd64.deb …
Unpacking libteckit0:amd64 (2.5.11+ds1-1) …
Selecting previously unselected package libtexlua53:amd64.
Preparing to unpack …/34-libtexlua53_2021.20210626.59705-1ubuntu0.2_amd64.deb
…
Unpacking libtexlua53:amd64 (2021.20210626.59705-1ubuntu0.2) …
Selecting previously unselected package libtexluajit2:amd64.
Preparing to unpack
…/35-libtexluajit2_2021.20210626.59705-1ubuntu0.2_amd64.deb …
Unpacking libtexluajit2:amd64 (2021.20210626.59705-1ubuntu0.2) …
Selecting previously unselected package libzzip-0-13:amd64.
Preparing to unpack …/36-libzzip-0-13_0.13.72+dfsg.1-1.1_amd64.deb …
Unpacking libzzip-0-13:amd64 (0.13.72+dfsg.1-1.1) …
Selecting previously unselected package xfonts-encodings.
Preparing to unpack …/37-xfonts-encodings_1%3a1.0.5-0ubuntu2_all.deb …
Unpacking xfonts-encodings (1:1.0.5-0ubuntu2) …
Selecting previously unselected package xfonts-utils.
Preparing to unpack …/38-xfonts-utils_1%3a7.7+6build2_amd64.deb …
Unpacking xfonts-utils (1:7.7+6build2) …
Selecting previously unselected package lmodern.
Preparing to unpack …/39-lmodern_2.004.5-6.1_all.deb …
Unpacking lmodern (2.004.5-6.1) …
Selecting previously unselected package pandoc-data.
Preparing to unpack …/40-pandoc-data_2.9.2.1-3ubuntu2_all.deb …
Unpacking pandoc-data (2.9.2.1-3ubuntu2) …
Selecting previously unselected package pandoc.
Preparing to unpack …/41-pandoc_2.9.2.1-3ubuntu2_amd64.deb …
Unpacking pandoc (2.9.2.1-3ubuntu2) …
Selecting previously unselected package preview-latex-style.
Preparing to unpack …/42-preview-latex-style_12.2-1ubuntu1_all.deb …
Unpacking preview-latex-style (12.2-1ubuntu1) …
Selecting previously unselected package t1utils.
Preparing to unpack …/43-t1utils_1.41-4build2_amd64.deb …
Unpacking t1utils (1.41-4build2) …
Selecting previously unselected package teckit.
Preparing to unpack …/44-teckit_2.5.11+ds1-1_amd64.deb …
Unpacking teckit (2.5.11+ds1-1) …
Selecting previously unselected package tex-gyre.
Preparing to unpack …/45-tex-gyre_20180621-3.1_all.deb …
Unpacking tex-gyre (20180621-3.1) …
Selecting previously unselected package texlive-binaries.
Preparing to unpack …/46-texlive-
binaries_2021.20210626.59705-1ubuntu0.2_amd64.deb …
Unpacking texlive-binaries (2021.20210626.59705-1ubuntu0.2) …
Selecting previously unselected package texlive-base.
Preparing to unpack …/47-texlive-base_2021.20220204-1_all.deb …
Unpacking texlive-base (2021.20220204-1) …
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Selecting previously unselected package texlive-fonts-recommended.
Preparing to unpack …/48-texlive-fonts-recommended_2021.20220204-1_all.deb …
Unpacking texlive-fonts-recommended (2021.20220204-1) …
Selecting previously unselected package texlive-latex-base.
Preparing to unpack …/49-texlive-latex-base_2021.20220204-1_all.deb …
Unpacking texlive-latex-base (2021.20220204-1) …
Selecting previously unselected package libfontbox-java.
Preparing to unpack …/50-libfontbox-java_1%3a1.8.16-2_all.deb …
Unpacking libfontbox-java (1:1.8.16-2) …
Selecting previously unselected package libpdfbox-java.
Preparing to unpack …/51-libpdfbox-java_1%3a1.8.16-2_all.deb …
Unpacking libpdfbox-java (1:1.8.16-2) …
Selecting previously unselected package texlive-latex-recommended.
Preparing to unpack …/52-texlive-latex-recommended_2021.20220204-1_all.deb …
Unpacking texlive-latex-recommended (2021.20220204-1) …
Selecting previously unselected package texlive-pictures.
Preparing to unpack …/53-texlive-pictures_2021.20220204-1_all.deb …
Unpacking texlive-pictures (2021.20220204-1) …
Selecting previously unselected package texlive-latex-extra.
Preparing to unpack …/54-texlive-latex-extra_2021.20220204-1_all.deb …
Unpacking texlive-latex-extra (2021.20220204-1) …
Selecting previously unselected package texlive-plain-generic.
Preparing to unpack …/55-texlive-plain-generic_2021.20220204-1_all.deb …
Unpacking texlive-plain-generic (2021.20220204-1) …
Selecting previously unselected package tipa.
Preparing to unpack …/56-tipa_2%3a1.3-21_all.deb …
Unpacking tipa (2:1.3-21) …
Selecting previously unselected package texlive-xetex.
Preparing to unpack …/57-texlive-xetex_2021.20220204-1_all.deb …
Unpacking texlive-xetex (2021.20220204-1) …
Setting up fonts-lato (2.0-2.1) …
Setting up fonts-noto-mono (20201225-1build1) …
Setting up libwoff1:amd64 (1.0.2-1build4) …
Setting up libtexlua53:amd64 (2021.20210626.59705-1ubuntu0.2) …
Setting up libijs-0.35:amd64 (0.35-15build2) …
Setting up libtexluajit2:amd64 (2021.20210626.59705-1ubuntu0.2) …
Setting up libfontbox-java (1:1.8.16-2) …
Setting up rubygems-integration (1.18) …
Setting up libzzip-0-13:amd64 (0.13.72+dfsg.1-1.1) …
Setting up fonts-urw-base35 (20200910-1) …
Setting up poppler-data (0.4.11-1) …
Setting up tex-common (6.17) …
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based
frontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line
78.)
debconf: falling back to frontend: Readline
update-language: texlive-base not installed and configured, doing nothing!
```

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Setting up libfontenc1:amd64 (1:1.1.4-1build3) …
Setting up libjbig2dec0:amd64 (0.19-3build2) …
Setting up libteckit0:amd64 (2.5.11+ds1-1) …
Setting up libapache-pom-java (18-1) …
Setting up ruby-net-telnet (0.1.1-2) …
Setting up xfonts-encodings (1:1.0.5-0ubuntu2) …
Setting up t1utils (1.41-4build2) …
Setting up libidn12:amd64 (1.38-4ubuntu1) …
Setting up fonts-texgyre (20180621-3.1) …
Setting up libkpathsea6:amd64 (2021.20210626.59705-1ubuntu0.2) …
Setting up ruby-webrick (1.7.0-3ubuntu0.1) …
Setting up libcmark-gfm0.29.0.gfm.3:amd64 (0.29.0.gfm.3-3) …
Setting up fonts-lmodern (2.004.5-6.1) …
Setting up libcmark-gfm-extensions0.29.0.gfm.3:amd64 (0.29.0.gfm.3-3) …
Setting up fonts-droid-fallback (1:6.0.1r16-1.1build1) …
Setting up pandoc-data (2.9.2.1-3ubuntu2) …
Setting up ruby-xmlrpc (0.3.2-1ubuntu0.1) …
Setting up libsynctex2:amd64 (2021.20210626.59705-1ubuntu0.2) …
Setting up libgs9-common (9.55.0~dfsg1-0ubuntu5.10) …
Setting up teckit (2.5.11+ds1-1) …
Setting up libpdfbox-java (1:1.8.16-2) …
Setting up libgs9:amd64 (9.55.0~dfsg1-0ubuntu5.10) …
Setting up preview-latex-style (12.2-1ubuntu1) …
Setting up libcommons-parent-java (43-1) …
Setting up dvisvgm (2.13.1-1) …
Setting up libcommons-logging-java (1.2-2) …
Setting up xfonts-utils (1:7.7+6build2) …
Setting up libptexenc1:amd64 (2021.20210626.59705-1ubuntu0.2) …
Setting up pandoc (2.9.2.1-3ubuntu2) …
Setting up texlive-binaries (2021.20210626.59705-1ubuntu0.2) …
update-alternatives: using /usr/bin/xdvi-xaw to provide /usr/bin/xdvi.bin
(xdvi.bin) in auto mode
update-alternatives: using /usr/bin/bibtex.original to provide /usr/bin/bibtex
(bibtex) in auto mode
Setting up lmodern (2.004.5-6.1) …
Setting up texlive-base (2021.20220204-1) …
/usr/bin/ucfr
/usr/bin/ucfr
/usr/bin/ucfr
/usr/bin/ucfr
mktexlsr: Updating /var/lib/texmf/ls-R-TEXLIVEDIST…
mktexlsr: Updating /var/lib/texmf/ls-R-TEXMFMAIN…
mktexlsr: Updating /var/lib/texmf/ls-R…
mktexlsr: Done.
tl-paper: setting paper size for dvips to a4:
/var/lib/texmf/dvips/config/config-paper.ps
tl-paper: setting paper size for dvipdfmx to a4:
/var/lib/texmf/dvipdfmx/dvipdfmx-paper.cfg
```

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tl-paper: setting paper size for xdvi to a4: /var/lib/texmf/xdvi/XDvi-paper
tl-paper: setting paper size for pdftex to a4: /var/lib/texmf/tex/generic/tex-
ini-files/pdftexconfig.tex
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based
frontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line
78.)
debconf: falling back to frontend: Readline
Setting up tex-gyre (20180621-3.1) …
Setting up texlive-plain-generic (2021.20220204-1) …
Setting up texlive-latex-base (2021.20220204-1) …
Setting up texlive-latex-recommended (2021.20220204-1) …
Setting up texlive-pictures (2021.20220204-1) …
Setting up texlive-fonts-recommended (2021.20220204-1) …
Setting up tipa (2:1.3-21) …
Setting up texlive-latex-extra (2021.20220204-1) …
Setting up texlive-xetex (2021.20220204-1) …
Setting up rake (13.0.6-2) …
Setting up libruby3.0:amd64 (3.0.2-7ubuntu2.8) …
Setting up ruby3.0 (3.0.2-7ubuntu2.8) …
Setting up ruby (1:3.0~exp1) …
Setting up ruby-rubygems (3.3.5-2) …
Processing triggers for man-db (2.10.2-1) …
Processing triggers for mailcap (3.70+nmu1ubuntu1) …
Processing triggers for fontconfig (2.13.1-4.2ubuntu5) …
Processing triggers for libc-bin (2.35-0ubuntu3.8) …
/sbin/ldconfig.real: /usr/local/lib/libtbb.so.12 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtbbbind_2_5.so.3 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtbbbind.so.3 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libur_adapter_opencl.so.0 is not a symbolic
link

/sbin/ldconfig.real: /usr/local/lib/libtbbbind_2_0.so.3 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtbbmalloc.so.2 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libumf.so.0 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libur_loader.so.0 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtcm.so.1 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libhwloc.so.15 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtcm_debug.so.1 is not a symbolic link
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/sbin/ldconfig.real: /usr/local/lib/libtbbmalloc_proxy.so.2 is not a symbolic
link

/sbin/ldconfig.real: /usr/local/lib/libur_adapter_level_zero.so.0 is not a
symbolic link

Processing triggers for tex-common (6.17) …
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based
frontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line
78.)
debconf: falling back to frontend: Readline
Running updmap-sys. This may take some time… done.
Running mktexlsr /var/lib/texmf … done.
Building format(s) --all.
        This may take some time… done.
```

```
[ ]: !jupyter nbconvert --to pdf "/content/drive/MyDrive/Colab_Notebooks/Projects/
     ↪Statistical_Data_Visualization.ipynb"
```