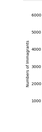
In [15]:
```
import matplotlib.pyplot as plt
import pandas as pd
import seaborn as sns
import numpy as np
from wordcloud import STOPWORDS, WordCloud
```

In [16]:
```
df = pd.read_excel('D:/Excel Sheets/prepared_canada_data.xlsx')
```

In [18]:
```
df_continent = df.groupby('Continent', axis=0).sum()
years = df.columns[2:-1]
```

Line Plot

In [20]:
```
df_set_index('Country', inplace=True)
plt.figure(figsize=(10, 5))
df_Egypt = df.loc['Egypt', years].transpose()
plt.title('Immigration from Egypt To Canda')
plt.xlabel('Years')
plt.ylabel('Numbers of Immigrants')
plt.grid()
plt.show()
```



Area Plot

In [28]:
```
df.sort_values(['Total'], ascending=False, axis=0, inplace=True)
df_top5 = df.head(5).transpose()
df_top5.plot(figsize=(10, 5), kind='area')
plt.title('Immigration from Egypt')
plt.xlabel('Numbers of Immigration')
plt.ylabel('Years')
plt.show()
```

Histogram

In [30]:
```
count, bin_edges = np.histogram(df['2013'])
print('Bin edges: {}'.format(bin_edges))
plt.title('Immigration trend in 2013')
plt.xlabel('Number of Countries')
plt.ylabel('Number of Immigrants')
plt.grid()
plt.xticks(bin_edges)
plt.figure(figsize=(10, 5))
plt.show()
```

```
<Figure size 1000x500 with 0 Axes>
```

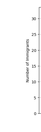
In [34]:
```
# Set 'Country' column as index
df_set_index('Country', inplace=True)

# Select data for Egypt, Ghana, and Cameroon, and transpose
df_histogram = df.loc['Egypt', 'Ghana', 'Cameroon'], years].transpose()

# Calculate Histogram
count, bin_edges = np.histogram(df_histogram, 15)

# Plot Histogram
df_histogram.plot(kind='hist', figsize=(10, 5), bins=15, alpha=0.6,
                  xticks=bin_edges,
                  color=['red', 'darkslateblue', 'mediumseagreen'],
                  stacked=True)

plt.title('Immigration from Egypt, Cameroon, Ghana')
plt.xlabel('Number of Years')
plt.ylabel('Number of Immigrants')
plt.grid()
plt.show()
```



Bar Chart

In [36]:
```
df_set_index('Country', inplace=True)
plt.figure(figsize=(10, 5))
df_Egypt.plot(kind='bar', color='bar')
plt.title('IMMagration from Egypt To Canda'
plt.xlabel('Years'
plt.ylabel('Numbers of Immigrants')
plt.grid()
plt.show()
```

In [38]:
```
df_set_index('Country', inplace=True)
plt.figure(figsize=(10, 5))
df_Egypt.plot(kind='barh', color='bar')
plt.title('IMMagration from Egypt To Canda'
plt.xlabel('Years'
plt.ylabel('Numbers of Immigrants')
plt.grid()
plt.show()
```

Pie chart

In [111]:
```
plt.figure(figsize = (10, 5))
df_continent['Total'].plot(kind='pie')
plt.title('Continent Migrations')
plt.show()
```


Box Plot

In [35]:
```
df_set_index('Country', inplace=True)
plt.figure(figsize=(10, 5))
df_Egypt.plot(kind='box')
plt.grid()
plt.title('Egypt Migrations'
plt.ylabel('Numbers of immigrants')
plt.show()
```

```
<Figure size 1000x500 with 0 Axes>
```

Word Clouds

In [111]:
```
df_words = pd.read_excel('D:/Excel Sheets/dig data.xlsx')
```

In [113]:
```
words = ' '.joinlDF_words['Job Title'])
stopwords = set(STOPWORDS)
# Generate word cloud
dsc_wc = WordCloud(
    background_color='white',
    stopwords=stopwords,
    max_words=2000,
    stopwords=stopwords
)
dsc_wc.generate(words)
fig = plt.figure(figsize=(10, 5))
dsc_wc.recolor(lambda, *kwargs, **kwargs) # Corrected 'interpolations' to 'interpolation'
plt.axis('off')
plt.show()
```

Scatter plot

In [121]:
```
df_scatter = pd.DataFrame(df[years].sum(axis=0))
```

In [124]:
```
df_scatter.reset_index(inplace=True)
df_scatter.columns = ['Years', 'Total']
df_scatter.plot(kind='scatter', x='Years', y='Total', figsize=(10, 5))
plt.title('Scatterdb')
plt.grid()
plt.show()
```

Bubble Scatter

In [126]:
```
df_bubble = df[years].transpose()
df_bubble.index = map(int, df_bubble.index)
df_bubble.index.name = 'year'
df_bubble.reset_index(inplace=True)
```

In [128]:
```
ax0 = df_bubble.plot(
    kind='scatter',
    x='year',
    y='Argentina',
    figsize=(10, 5),
    alpha=0.5,
    color='blue',
    s=df_bubble['Argentina'],
    xlim=(1975, 2015)

# create the second scatter plot on the same figure
ax1 = df_bubble.plot(
    kind='scatter',
    x='year',
    y='Argentina',
    figsize=(10, 5),
    alpha=0.5,
    color='blue',
    s=df_bubble['Argentina'],
    ax=ax0

ax0.grid()
plt.show()
```

Regression PLot

In [97]:
```
plt.figure(figsize=(10, 5))
ax = sns.regplot(x='Years', y='Total', data=df_scatter, color='green', marker='+', scatter_kws={'s': 200})
ax.set(xlabel='Years', ylabel='Numbers of immigrants')
ax.grid()
ax.set_title('Immagration to Canda')
plt.show()
```