# Pandas

**數據圖像化**

In [33]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from matplotlib.font_manager import FontProperties
font = FontProperties(fname='/Library/Fonts/Microsoft/Microsoft YaHei.ttf')
```

In [34]:
```
#從gapminder基金會下載數據csv
csv_file = "https://storage.googleapis.com/learn_pd_like_tidyverse/gapminder.csv"
gapminder = pd.read_csv(csv_file,encoding="utf_8_sig")
print(type(gapminder))
gapminder.head(50)
```

```
<class 'pandas.core.frame.DataFrame'>
```

Out[34]:

| | country | continent | year | lifeExp | pop | gdpPercap |
|---|---|---|---|---|---|---|
| 0 | Afghanistan | Asia | 1952 | 28.801 | 8425333 | 779.445314 |
| 1 | Afghanistan | Asia | 1957 | 30.332 | 9240934 | 820.853030 |
| 2 | Afghanistan | Asia | 1962 | 31.997 | 10267083 | 853.100710 |
| 3 | Afghanistan | Asia | 1967 | 34.020 | 11537966 | 836.197138 |
| 4 | Afghanistan | Asia | 1972 | 36.088 | 13079460 | 739.981106 |
| 5 | Afghanistan | Asia | 1977 | 38.438 | 14880372 | 786.113360 |
| 6 | Afghanistan | Asia | 1982 | 39.854 | 12881816 | 978.011439 |
| 7 | Afghanistan | Asia | 1987 | 40.822 | 13867957 | 852.395945 |
| 8 | Afghanistan | Asia | 1992 | 41.674 | 16317921 | 649.341395 |
| 9 | Afghanistan | Asia | 1997 | 41.763 | 22227415 | 635.341351 |
| 10 | Afghanistan | Asia | 2002 | 42.129 | 25268405 | 726.734055 |
| 11 | Afghanistan | Asia | 2007 | 43.828 | 31889923 | 974.580338 |
| 12 | Albania | Europe | 1952 | 55.230 | 1282697 | 1601.056136 |
| 13 | Albania | Europe | 1957 | 59.280 | 1476505 | 1942.284244 |
| 14 | Albania | Europe | 1962 | 64.820 | 1728137 | 2312.888958 |
| 15 | Albania | Europe | 1967 | 66.220 | 1984060 | 2760.196931 |
| 16 | Albania | Europe | 1972 | 67.690 | 2263554 | 3313.422188 |

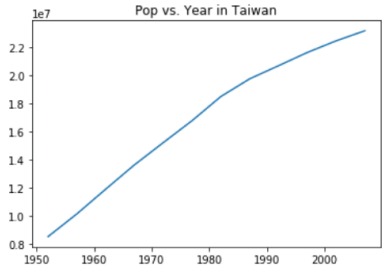
# 專案

In [35]:
```
#台灣數據
gapminder[gapminder['country'] == 'Taiwan']
```

Out[35]:

| | country | continent | year | lifeExp | pop | gdpPercap |
|---|---|---|---|---|---|---|
| 1500 | Taiwan | Asia | 1952 | 58.50 | 8550362 | 1206.947913 |
| 1501 | Taiwan | Asia | 1957 | 62.40 | 10164215 | 1507.861290 |
| 1502 | Taiwan | Asia | 1962 | 65.20 | 11918938 | 1822.879028 |
| 1503 | Taiwan | Asia | 1967 | 67.50 | 13648692 | 2643.858681 |
| 1504 | Taiwan | Asia | 1972 | 69.39 | 15226039 | 4062.523897 |
| 1505 | Taiwan | Asia | 1977 | 70.59 | 16785196 | 5596.519826 |
| 1506 | Taiwan | Asia | 1982 | 72.16 | 18501390 | 7426.354774 |
| 1507 | Taiwan | Asia | 1987 | 73.40 | 19757799 | 11054.561750 |
| 1508 | Taiwan | Asia | 1992 | 74.26 | 20686918 | 15215.657900 |
| 1509 | Taiwan | Asia | 1997 | 75.25 | 21628605 | 20206.820980 |
| 1510 | Taiwan | Asia | 2002 | 76.99 | 22454239 | 23235.423290 |
| 1511 | Taiwan | Asia | 2007 | 78.40 | 23174294 | 28718.276840 |

In [45]:
```
#台灣人口走勢
gapminder_tw = gapminder[gapminder['country'] == 'Taiwan']
gapminder_tw[['year', 'pop']].plot(kind = 'line', x = 'year', y = 'pop', title='Pop vs. Year in Taiwan', legend = False)
plt.show()
```

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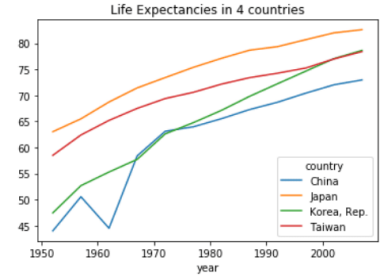
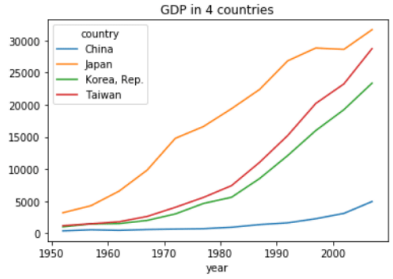
# 鄰近國家壽命線圖/GDP

[57]:
```
#鄰近國家壽命比較
gapminder_asia = gapminder.loc[gapminder['country'].isin(['China', 'Japan', 'Korea, Rep.', 'Taiwan'])]
gapminder_asia_pivot = gapminder_asia.pivot_table(values = 'lifeExp', columns = 'country', index = 'year')
gapminder_northasia_pivot.plot(title = 'Life Expectancies in 4 countries')
plt.show()
```




[56]:
```
#GDP比較
gapminder_asia = gapminder.loc[gapminder['country'].isin(['China', 'Japan', 'Korea, Rep.', 'Taiwan'])]
gapminder_asia_pivot = gapminder_asia.pivot_table(values = 'gdpPercap', columns = 'country', index = 'year')
gapminder_asia_pivot.plot(title = 'GDP in 4 countries')
plt.show()
```

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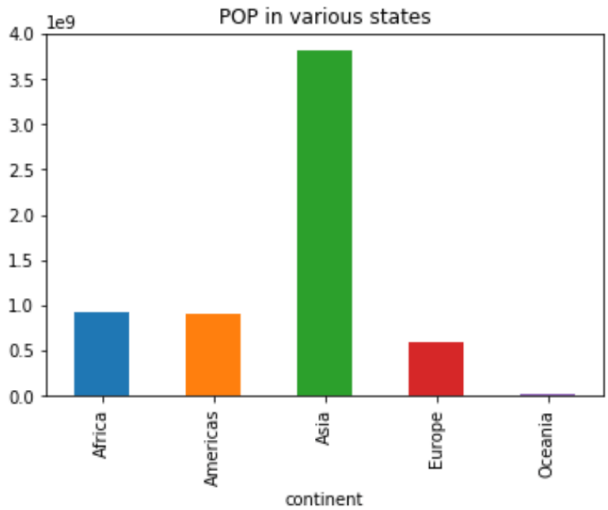
# Bar chart 人口比例

n [66]:
```
#各州人口比例
summarized_df = gapminder[gapminder['year'] == 2007].groupby(by = 'continent')['pop'].sum()
summarized_df.plot(kind = 'bar',title = 'POP in various states')
plt.show()
```

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