chinook.netcore.io-QueryInvoices

October 21, 2021

[ ]:
```
%pip install servicestack



import datetime
import decimal
from marshmallow.fields import *
from servicestack import *
from typing import *
from dataclasses import dataclass, field
from dataclasses_json import dataclass_json, LetterCase, Undefined, config
from enum import Enum, IntEnum


@dataclass_json(letter_case=LetterCase.CAMEL, undefined=Undefined.EXCLUDE)
@dataclass
class Invoices:
    invoice_id: int = 0
    customer_id: int = 0
    invoice_date: datetime.datetime = datetime.datetime(1, 1, 1)
    billing_address: Optional[str] = None
    billing_city: Optional[str] = None
    billing_state: Optional[str] = None
    billing_country: Optional[str] = None
    billing_postal_code: Optional[str] = None
    total: Decimal = decimal.Decimal(0)


# @Route("/invoices", "GET")
# @Route("/invoices/{InvoiceId}", "GET")
@dataclass_json(letter_case=LetterCase.CAMEL, undefined=Undefined.EXCLUDE)
@dataclass
class QueryInvoices(QueryDb[Invoices], IReturn[QueryResponse[Invoices]], IGet):
    invoice_id: Optional[int] = None
```

```
from IPython.core.display import display, HTML

client = JsonServiceClient("https://chinook.netcore.io")
```

[2]:
```
response = client.send(QueryInvoices())
```

[ ]:
```
%pip install pandas
%pip install matplotlib
```

[4]:
```
import pandas as pd
import matplotlib.pyplot as plt
```

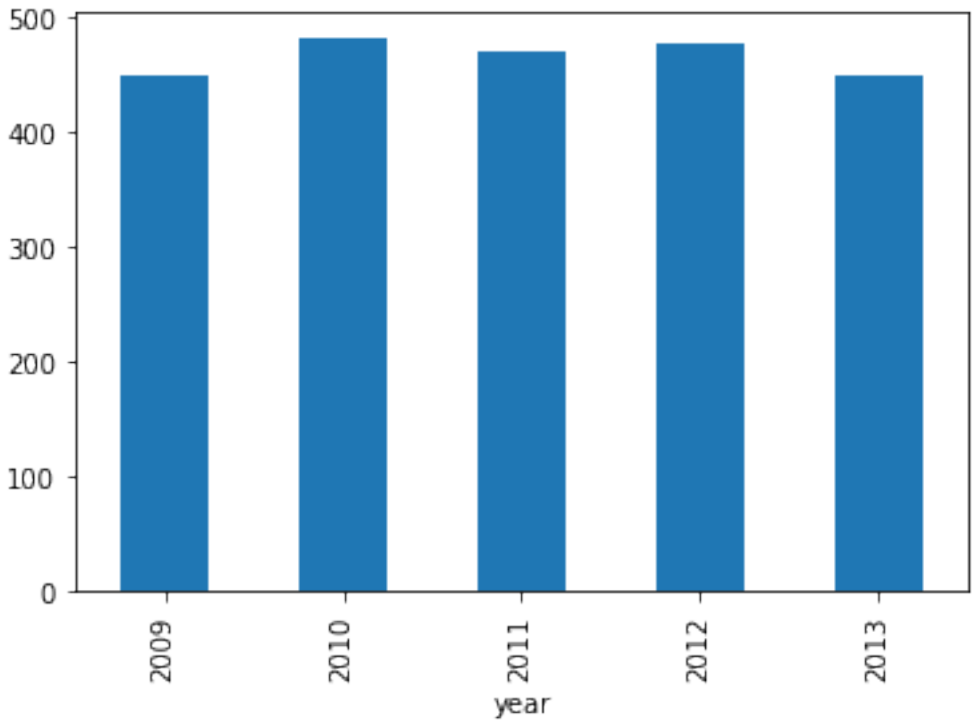
[5]:
```
df = pd.DataFrame(response.results)
```

[6]:
```
df['year'] = pd.DatetimeIndex(df['invoice_date']).year
```

1 Sales by year

Looking at the sales across 5 years of data we have small dips in 2009 and 2013.

[7]:
```
df.groupby('year')['total'].sum().astype(float).plot.bar();
```

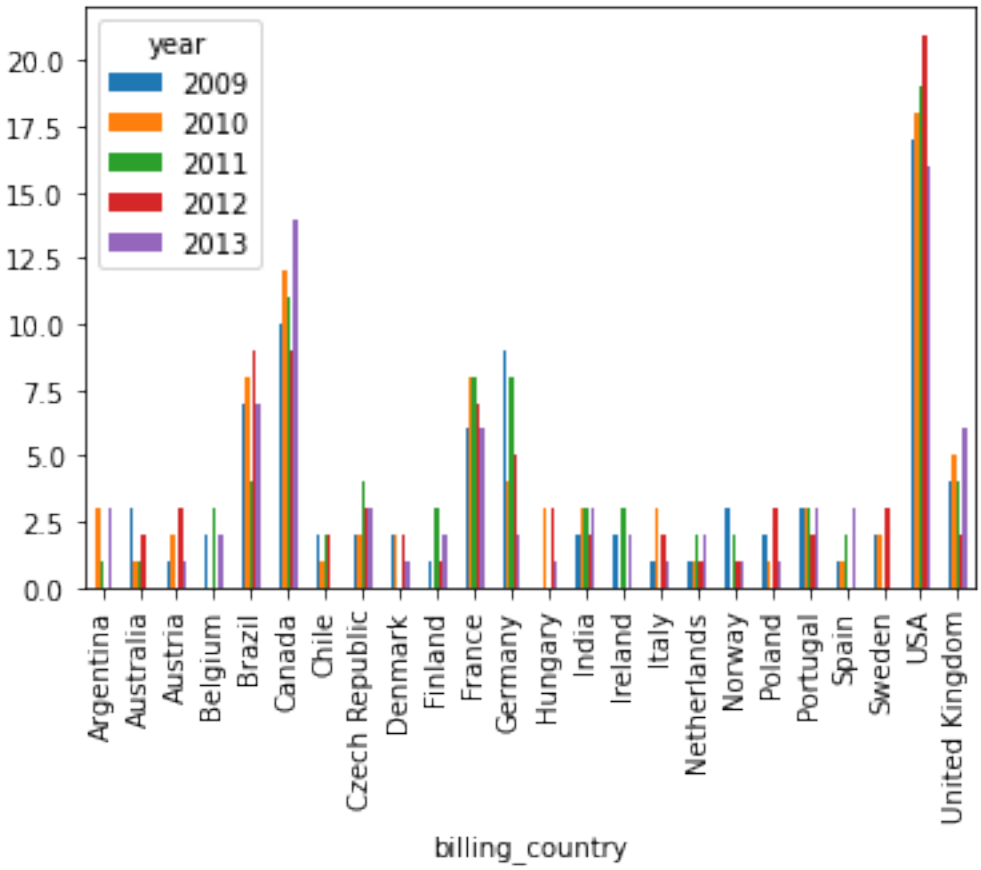


2 Sales by country and year

Looking more closely at our breakdown of revenue by country, the USA remains our biggest market, closely followed by Canada, Brazil, France and Germany.

[8]:
```
df.groupby('year').billing_country.value_counts().unstack(0).plot.bar()
```

[8]: <AxesSubplot:xlabel='billing_country'>



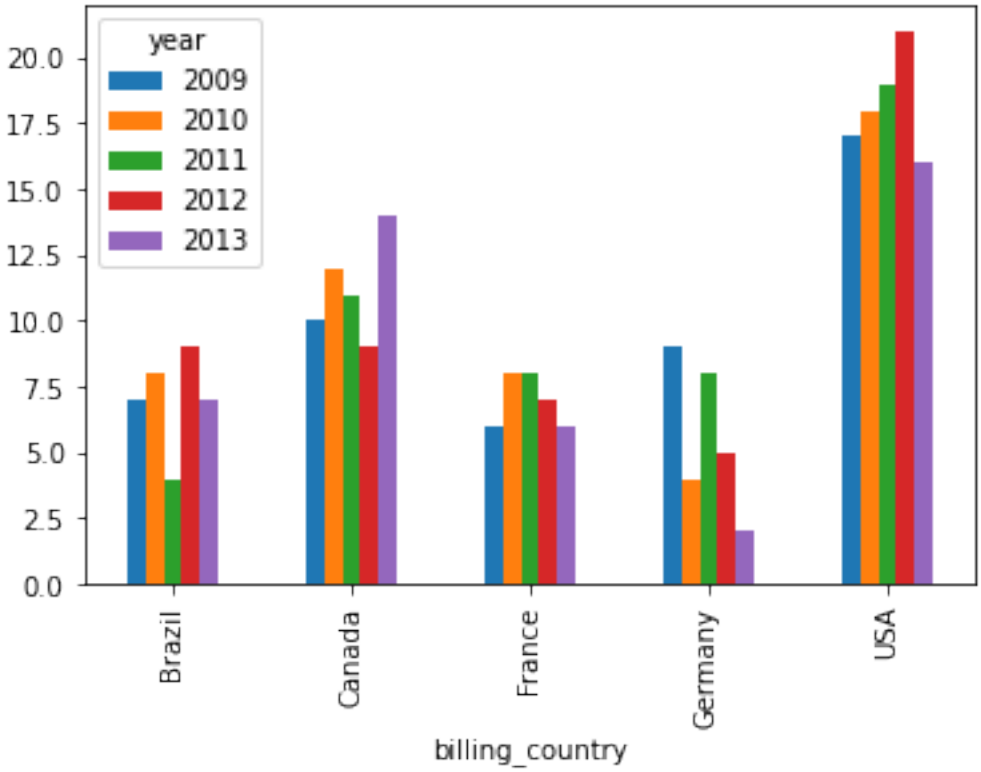
2.1 Sales in top 5 countries

Looking more closely at these top performing countries we can see country specific factors have impacted sales creating no trend consistently across all 5 countries.

[9]:
```
import numpy as np
import functools
def conjunction(*conditions):
    return functools.reduce(np.logical_or, conditions)
```

```
is_usa = df.billing_country == 'USA'
is_can = df.billing_country == 'Canada'
is_bra = df.billing_country == 'Brazil'
is_fra = df.billing_country == 'France'
is_ger = df.billing_country == 'Germany'
df[conjunction(is_usa,is_can,is_bra,is_fra,is_ger)].groupby('year').
 ↪billing_country.value_counts().unstack(0).plot.bar()
```

[9]: <AxesSubplot:xlabel='billing_country'>



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