In [1]:

```python
import pandas as pd
import seaborn as sns
penguins = sns.load_dataset("penguins")
```

In [2]:

```python
penguins.head()
```

Out[2]:

	species	island	bill_length_mm	bill_depth_mm	flipper_length_mm	body_mass_g	sex
0	Adelie	Torgersen	39.1	18.7	181.0	3750.0	Male
1	Adelie	Torgersen	39.5	17.4	186.0	3800.0	Female
2	Adelie	Torgersen	40.3	18.0	195.0	3250.0	Female
3	Adelie	Torgersen	NaN	NaN	NaN	NaN	NaN
4	Adelie	Torgersen	36.7	19.3	193.0	3450.0	Female

Expectations

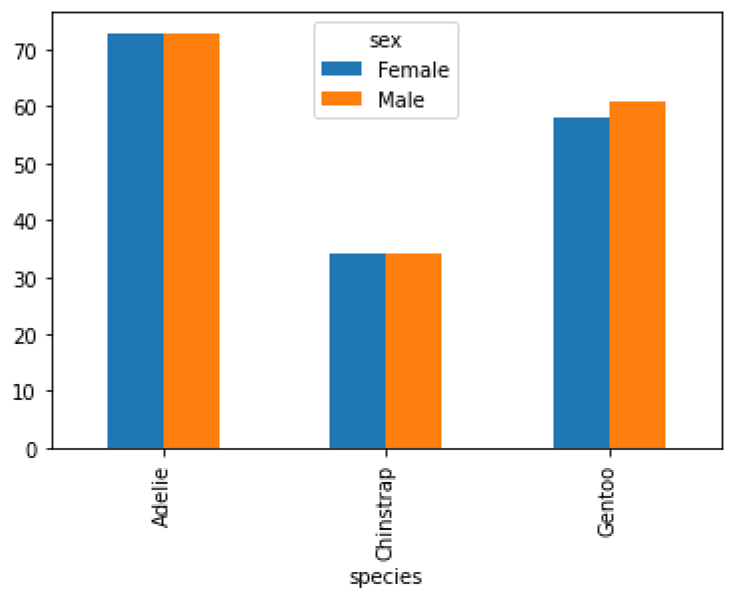
I believe the columns will correlate.

In [11]:

```python
penguins.groupby(['species','sex']).size().unstack('sex', fill_value=0).plot(kind='bar')
```

Out[11]:

```
<AxesSubplot:xlabel='species'>
```



The amount of penguins of each sex seems to be around the same with each of the 3 species.

In [12]:

```python
penguins.groupby(['species','sex']).size().unstack('sex', fill_value=0)
```

Out[12]:

sex	Female	Male
species		
Adelie	73	73
Chinstrap	34	34
Gentoo	58	61

In [17]:

```python
from scipy.stats import chi2_contingency
```

In [18]:

```python
chi2_contingency(penguins.groupby(['species','sex']).size().unstack('sex', fill_value=0))
```

Out[18]:

```
(0.04860717014078318,
 0.9759893689765846,
 2,
 array([[72.34234234, 73.65765766],
        [33.69369369, 34.30630631],
        [58.96396396, 60.03603604]]))
```

There seems to be a 98% change the columns arent the same.

Expectations

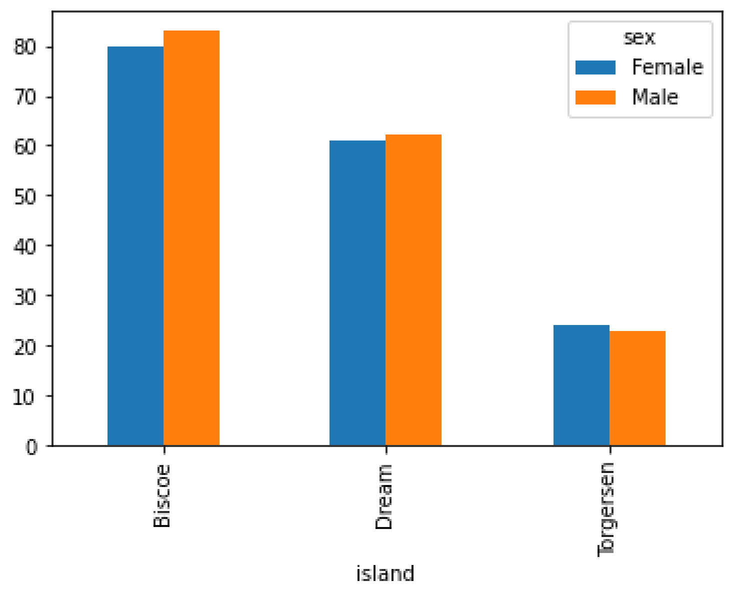
I believe the columns will correlate.

In [10]:

```python
penguins.groupby(['island','sex']).size().unstack('sex', fill_value=0).plot(kind='bar')
```

Out[10]:

```
<AxesSubplot:xlabel='island'>
```



The amount of penguins of each sex seems to be around the same on each of the 3 islands.

In [19]:

```python
penguins.groupby(['island','sex']).size().unstack('sex', fill_value=0)
```

Out[19]:

sex	Female	Male
island		
Biscoe	80	83
Dream	61	62
Torgersen	24	23

In [20]:

```python
chi2_contingency(penguins.groupby(['island','sex']).size().unstack('sex', fill_value=0))
```

Out[20]:

```
(0.05759904881286207,
 0.971611229281065,
 2,
 array([[80.76576577, 82.23423423],
        [60.94594595, 62.05405405],
        [23.28828829, 23.71171171]]))
```

There seems to be a 97% change the columns arent the same.