

```
In [54]: df1
```

```
Out[54]:
```

|   | data1 | key |
|---|-------|-----|
| 0 | 0     | b   |
| 1 | 1     | b   |
| 2 | 2     | a   |
| 3 | 3     | c   |
| 4 | 4     | a   |
| 5 | 5     | b   |

```
In [55]: df2
```

```
Out[55]:
```

|   | data1 | key |
|---|-------|-----|
| 0 | 0     | a   |
| 1 | 1     | b   |
| 2 | 2     | a   |
| 3 | 3     | b   |
| 4 | 4     | d   |

```
In [61]: pd.merge(df1,df2,on="key",how="inner")
```

```
Out[61]:
```

|   | data1_x | key | data1_y |
|---|---------|-----|---------|
| 0 | 0       | b   | 1       |
| 1 | 0       | b   | 3       |
| 2 | 1       | b   | 1       |
| 3 | 1       | b   | 3       |
| 4 | 5       | b   | 1       |
| 5 | 5       | b   | 3       |
| 6 | 2       | a   | 0       |
| 7 | 2       | a   | 2       |
| 8 | 4       | a   | 0       |
| 9 | 4       | a   | 2       |

```
In [59]: pd.merge(df1,df2,how="left",on="key")
```

```
Out[59]:
```

```
In [59]: pd.merge(df1,df2,how="left",on="key")
```

Out[59]:

|    | data1_x | key | data1_y |
|----|---------|-----|---------|
| 0  | 0       | b   | 1.0     |
| 1  | 0       | b   | 3.0     |
| 2  | 1       | b   | 1.0     |
| 3  | 1       | b   | 3.0     |
| 4  | 2       | a   | 0.0     |
| 5  | 2       | a   | 2.0     |
| 6  | 3       | c   | NaN     |
| 7  | 4       | a   | 0.0     |
| 8  | 4       | a   | 2.0     |
| 9  | 5       | b   | 1.0     |
| 10 | 5       | b   | 3.0     |

```
In [62]: pd.merge(df1,df2,how="outer",on="key")
```

Out[62]:

|    | data1_x | key | data1_y |
|----|---------|-----|---------|
| 0  | 0.0     | b   | 1.0     |
| 1  | 0.0     | b   | 3.0     |
| 2  | 1.0     | b   | 1.0     |
| 3  | 1.0     | b   | 3.0     |
| 4  | 5.0     | b   | 1.0     |
| 5  | 5.0     | b   | 3.0     |
| 6  | 2.0     | a   | 0.0     |
| 7  | 2.0     | a   | 2.0     |
| 8  | 4.0     | a   | 0.0     |
| 9  | 4.0     | a   | 2.0     |
| 10 | 3.0     | c   | NaN     |
| 11 | NaN     | d   | 4.0     |

```
In [64]: pd.merge(df1,df2,how="cross")
```

Out[64]:

```
In [64]: pd.merge(df1,df2,how="cross")
```

```
Out[64]:
```

|    | data1_x | key_x | data1_y | key_y |
|----|---------|-------|---------|-------|
| 0  | 0       | b     | 0       | a     |
| 1  | 0       | b     | 1       | b     |
| 2  | 0       | b     | 2       | a     |
| 3  | 0       | b     | 3       | b     |
| 4  | 0       | b     | 4       | d     |
| 5  | 1       | b     | 0       | a     |
| 6  | 1       | b     | 1       | b     |
| 7  | 1       | b     | 2       | a     |
| 8  | 1       | b     | 3       | b     |
| 9  | 1       | b     | 4       | d     |
| 10 | 2       | a     | 0       | a     |
| 11 | 2       | a     | 1       | b     |
| 12 | 2       | a     | 2       | a     |
| 13 | 2       | a     | 3       | b     |
| 14 | 2       | a     | 4       | d     |
| 15 | 3       | c     | 0       | a     |
| 16 | 3       | c     | 1       | b     |
| 17 | 3       | c     | 2       | a     |
| 18 | 3       | c     | 3       | b     |
| 19 | 3       | c     | 4       | d     |
| 20 | 4       | a     | 0       | a     |
| 21 | 4       | a     | 1       | b     |
| 22 | 4       | a     | 2       | a     |
| 23 | 4       | a     | 3       | b     |
| 24 | 4       | a     | 4       | d     |
| 25 | 5       | b     | 0       | a     |
| 26 | 5       | b     | 1       | b     |
| 27 | 5       | b     | 2       | a     |
| 28 | 5       | b     | 3       | b     |
| 29 | 5       | b     | 4       | d     |

```
In [ ]:
```