

# How do I calculate the interquartile range in Python?

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## RECOMMENDED CITATION

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Calculating the interquartile range (IQR) in Python involves finding the difference between the third quartile (Q3) and the first quartile (Q1) of a given dataset. This range is used to measure the spread or variability of the data, and it is an important statistic in data analysis. To calculate the IQR in Python, one can use the built-in statistics module or the NumPy library. By using these functions, the IQR can be easily computed and incorporated into any data analysis or visualization process. The IQR is a valuable tool in understanding the distribution of data and identifying any outliers that may exist.

## Calculate The Interquartile Range in Python

The interquartile range, often denoted "IQR", is a way to measure the spread of the middle 50% of a dataset. It is calculated as the difference between the first quartile\* (the 25th percentile) and the third quartile (the 75th percentile) of a dataset.

Fortunately it's easy to calculate the interquartile range of a dataset in Python using the [numpy.percentile\(\)](#) function.

This tutorial shows several examples of how to use this function in practice.

### Example 1: Interquartile Range of One Array

The following code shows how to calculate the interquartile range of values in a single array:

```
import numpy as np
```

```
#define array of data  
data = np.array()  
  
#calculate interquartile range  
q3, q1 = np.percentile(data, )  
iqr = q3 - q1  
  
#display interquartile range  
iqr
```

**12.25**

The interquartile range of this dataset turns out to be 12.25. This is the spread of the middle 50% of values in this dataset.

Example 2: Interquartile Range of a Data Frame Column

The following code shows how to calculate the interquartile range of a single column in a data frame:

```
import numpy as np  
import pandas as pd  
  
#create data frame  
df = pd.DataFrame({'rating': ,
```

```
'points': ,  
'assists': ,  
'rebounds': })  
  
#calculate interquartile range of values in the 'points'  
column  
q75, q25 = np.percentile(df, )  
iqr = q75 - q25  
  
#display interquartile range  
iqr  
  
5.75
```

The interquartile range of values in the points column turns out to be 5.75.

### Example 3: Interquartile Range of Multiple Data Frame Columns

The following code shows how to calculate the interquartile range of multiple columns in a data frame at once:

```
import numpy as np  
import pandas as pd
```

```
#create data frame
```

```
df = pd.DataFrame({'rating': ,  
'points': ,  
'assists': ,  
'rebounds': })
```

```
#define function to calculate interquartile range
```

```
def find_iqr(x):  
return np.subtract(*np.percentile(x, ))
```

```
#calculate IQR for 'rating' and 'points' columns
```

```
df].apply(find_iqr)
```

```
rating 6.75
```

```
points 5.75
```

```
dtype: float64
```

```
#calculate IQR for all columns
```

```
df.apply(find_iqr)
```

```
rating 6.75
```

```
points 5.75
```

```
assists 2.50
```

```
rebounds 3.75
```

```
dtype: float64
```

**Note: We use the `pandas.DataFrame.apply()` function to calculate the IQR for multiple columns in the data frame above.**

**Is the Interquartile Range (IQR) Affected By Outliers?**

**How to Calculate the Interquartile Range (IQR) in Excel**

**Interquartile Range Calculator**

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