

# Frequency Distributions: Takeaways

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## Syntax

- Generating a frequency distribution table for a `Series` :

```
frequency_table = Series.value_counts()
```

- Sorting the values of frequency distribution table:

```
### In an ascending order (default) ###
```

```
freq_table_asc = Series.value_counts().sort_index()
```

```
### In a descending order ###
```

```
freq_table_desc = Series.value_counts().sort_index(ascending = False)
```

- Finding proportions and percentages in a frequency distribution table:

```
### Proportions ###
```

```
proportions = Series.value_counts(normalize = True)
```

```
### Percentages ###
```

```
percentages = Series.value_counts(normalize = True) * 100
```

- Finding the percentile rank of a value (score) in some array:

```
from scipy.stats import percentileofscore
```

```
percentile_rank = percentileofscore(a = some_array, score = some_score,  
                                   kind = 'weak')
```

- Finding percentiles:

```
### Only the quartiles ###
```

```
quartiles = Series.describe()
```

```
### Any percentile we want ###
```

```
percentiles = Series.describe(percentiles = [.1, .15, .33, .5, .592, .9])
```

- Generating a grouped frequency table:

```
### With 5 class intervals ###
```

```
gr_freq_table_5 = Series.value_counts(bins = 5)
```

```
### With 10 class intervals ###
```

```
gr_freq_table_10 = Series.value_counts(bins = 10)
```

## Concepts

- A table that shows the frequency for each unique value in a distribution is called a **frequency distribution table**.
- The frequencies can be expressed as:
  - Absolute counts (**absolute frequencies**).
  - Proportions or percentages (**relative frequencies**).
- The percentage of values that are equal or less than a value  $x$  is called the **percentile rank** of  $x$ . For instance, if the percentile rank of a value of 32 is 57%, 57% of the values are equal to or less than 32.
- If a value  $x$  has a percentile rank of  $p\%$ , we say that  $x$  is the  $p_{th}$  **percentile**. For instance, if 32 has a percentile rank of 57%, we say that 32 is the 57th percentile.
- Frequency distribution tables can be grouped in **class intervals** to form **grouped frequency distribution tables**. As a rule of thumb, 10 is a good number of class intervals to choose because it offers a good balance between information and comprehensibility.

## Resources

- [An intuitive introduction](#) to frequency distribution tables.
- [An intuitive introduction](#) to grouped frequency distribution tables.
- [The Wikipedia entry](#) on frequency distributions.