Machine Learning - Mean Median Mode

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Mean, Median, and Mode

What can we learn from looking at a group of numbers?

In Machine Learning (and in mathematics) there are often three values that interests us:

- **Mean** - The average value
- **Median** - The mid point value
- **Mode** - The most common value

Example: We have registered the speed of 13 cars:

```
speed = [99,86,87,88,111,86,103,87,94,78,77,85,86]
```

What is the average, the middle, or the most common speed value?

Mean

The mean value is the average value.

To calculate the mean, find the sum of all values, and divide the sum by the number of values:

(99+86+87+88+111+86+103+87+94+78+77+85+86) / 13 = 89.77

The NumPy module has a method for this. Learn about the NumPy module in our NumPy Tutorial.

Example

Use the NumPy `mean()` method to find the average speed:

```
import numpy

speed = [99,86,87,88,111,86,103,87,94,78,77,85,86]

x = numpy.mean(speed)

print(x)
```

Run example »

Median

The median value is the value in the middle, after you have sorted all the values:

77, 78, 85, 86, 86, 86, 87, 87, 88, 94, 99, 103, 111

It is important that the numbers are sorted before you can find the median.

The NumPy module has a method for this:

Example

Use the NumPy `median()` method to find the middle value:

```
import numpy

speed = [99,86,87,88,111,86,103,87,94,78,77,85,86]

x = numpy.median(speed)

print(x)
```

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If there are two numbers in the middle, divide the sum of those numbers by two.

77, 78, 85, 86, 86, 86, 87, 87, 94, 98, 99, 103

(86 + 87) / 2 = 86.5

Example

Using the NumPy module:

```
import numpy

speed = [99,86,87,88,86,103,87,94,78,77,85,86]

x = numpy.median(speed)

print(x)
```

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Mode

The Mode value is the value that appears the most number of times:

99, 86, 87, 88, 111, 86, 103, 87, 94, 78, 77, 85, 86 = 86

The SciPy module has a method for this:

Example

Use the SciPy `mode()` method to find the number that appears the most:

```
from scipy import stats

speed = [99,86,87,88,111,86,103,87,94,78,77,85,86]

x = stats.mode(speed)

print(x)
```

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Chapter Summary

The Mean, Median, and Mode are techniques that are often used in Machine Learning, so it is important to understand the concept behind them.

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