**Stats 1 Formula**

Measure of location: vs μ

|  |  |
| --- | --- |
| Sample | Population |
|  |  |
|  |  |
|  |  |

Measure of spread:

|  |  |
| --- | --- |
| Sample | Population |
|  |  |
|  |  |
|  |  |

 ⇔ 

1 standard deviation includes 2/3 of data

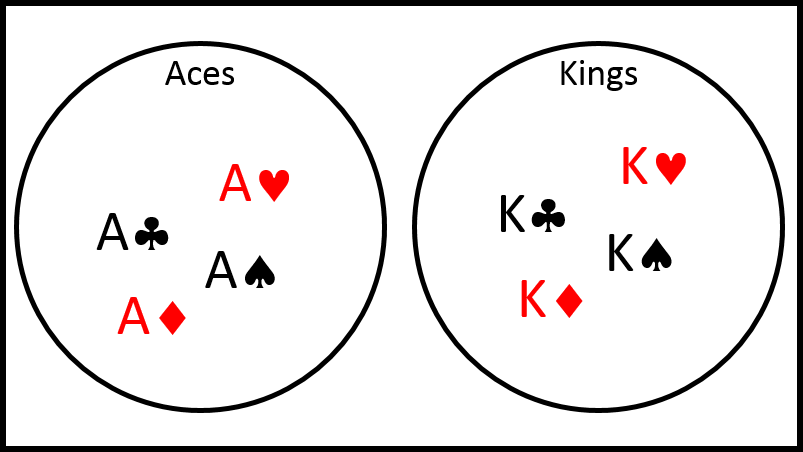
2 standard deviations include 95% of data

3 standard deviations include ‘almost all’ data

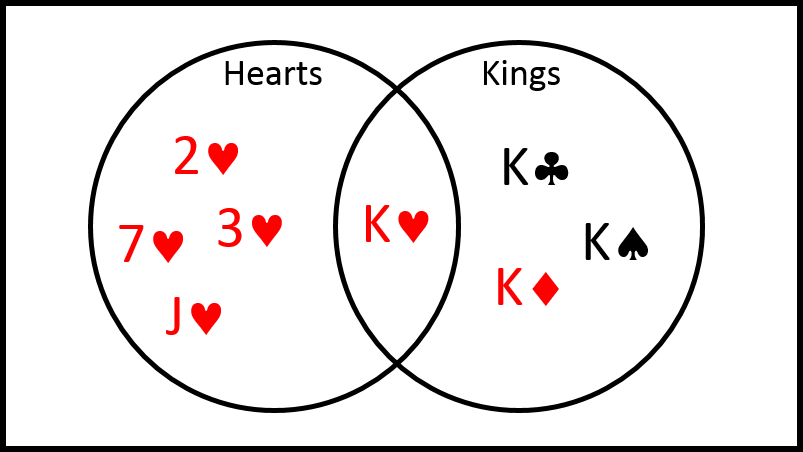
“a quantity expressing by how much the members of a group differ from the mean value for the group”

Probability

Mutually Exclusive



Non-Mutually Exclusive



⇔

Exclusive – no overlap of possible events

Exhaustive – all possible events are accounted for

If *any* of the following are true then they are *all* true & *events are independent*:

Binomial distribution (a discrete distribution):

Expectation & Variance of Binomial distribution:







Normal distribution (a continuous distribution):

The standard normal distribution:

Conversion:

To find μ and/or σ using given probabilities:

1. Draw a sketch or curve
2. Use the probabilities table to find corresponding z value
3. Use the z value together with the conversion to find μ and/or σ. Finding both μ and σ will involve solving simultaneous equations.

Estimation

|  |  |
| --- | --- |
| Sample mean = | Sample variance = |
| Unbiased estimator of  population mean =  (ie the distribution of many sample means) | Unbiased estimator of  population variance =  (ie the distribution of many sample variances) |

|  |  |
| --- | --- |
|  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Confidence Interval | 90% | 95% | 98% | 99% | 99.8% |
| z | 1.6449 | 1.9600 | 2.3263 | 2.5758 | 3.0902 |

Product Moment Correlation Coefficient:





Regression:

y on x







x on y





