# Distribution - STAT110 Otago



## Terms in this set (21)

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| *mean of the binary (Bernoulli) distribution* | *μ= p* |
| *variance(方差) of the binary (Bernoulli) distribution* | *σ^2 = p (1 - p)* |
| difference between binary distribution and binomial distribution | n = 1 **=> binary** distribution<br>n > 1 **=> binomial** distribution |
| *mean of the* binomial distribution | *μ*=np |
| variance *of the* binomial distribution | *σ^2* = np(1-p) |
| *Conditions for binomial distribution* | *Outcome is binary.*<br>*We have n independent trials.*<br>*The number of trials is fixed.*<br>*Probability of success π must stay constant.* |
| Probability of x successes in n trials | $= \binom{n}{x} \pi^x$ |

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| binomial coefficient (n choose k) | n! / (k!)(n-k)!<br><br>*no need to memorise* |
| *standard normal distribution(Z):* | Z ~ N ($\mu$ = 0 ,$\sigma$^2 = 1) |
| *μ (normal distribution()* | *moves the curve but does not change its shape* |
| σ (*moves the curve but does not change its shape*) | *spreads the curve more widely about X = μ but does not*<br>*alter the centre* |
| *Compare a relative frequency histogram with a probability distribution* | ***Relative frequency histogram** represents a **sample** (smaller number of individuals).*<br>***Probability density function** represents a **population** (large number of individuals).* |
| how to estimate the value of the parameters if estimate a *probability distribution curve from a relative frequency histogram* | *μ is estimated by the sample mean*<br>*σ is estimated by the sample standard deviation, s.* |
| what *does the areas under the normal distribution curve represent?* | probabilities |
| what is *Z-score (Z-value)* | number of standard deviations away from the mean<br>*Any normal distribution value, X ~ N(μX , σ^2X), can be put on the standard normal scale, Z ~ N(0, 1).*<br>***Z-score follows a standard normal distribution*** |
| formula for *Z-Value* | *Z = (X - μX) / σX* |
| when will *the sampling distribution of the mean will follow a normal distribution?* | if x(*the samples, not X*) is large enough |

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| Central Limit Theorem (CLT) | the **sampling** distribution derived from a simple random sample will **be approximately normally distributed** |
| What is the mean of the sampling distribution? | population mean<br><br>*μX_bar = μX* |
| *Variance of the sampling distribution* | the variability of sample means<br>$$\sigma_{\overline{X}} = \frac{\sigma_X}{\sqrt{n}}$$ |
| *Notes on the sampling distribution* | *If sample size n is greater, then the standard error of the mean is smaller **(more compact distribution, greater precision).***<br><br>*If X is normal, then X_bar is normal (for any n)*<br><br>*If X is not normal, then X_bar is approximately normal for large n (central limit theorem)* |