ANOVA analysis of frog dataset

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Results from ANOVA

Raw and tabled data

```
##
## Call:
## lm(formula = days ~ temperature, data = frog_data_clean)
##
## Residuals:
##    Min     1Q Median     3Q    Max
##   -2.3   -1.0    0.0    0.8    2.0
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    26.3000     0.2572  102.26   <2e-16 ***
## temperature18  -5.3000     0.3637  -14.57   <2e-16 ***
## temperature25 -10.1000     0.3637  -27.77   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.15 on 57 degrees of freedom
## Multiple R-squared:  0.9312, Adjusted R-squared:  0.9288
## F-statistic: 385.9 on 2 and 57 DF,  p-value: < 2.2e-16
```

Df	Sum Sq	Mean Sq	F value	Pr(>F)
2	1020.933	510.466667	385.8966	7.357304e-34
57	75.400	1.322807	NA	NA

term	estimate	std.error	statistic	p.value	conf.low	conf.high
(Intercept)	26.3	0.2571777	102.26394	2.781059e-66	25.785011	26.814989
temperature18	-5.3	0.3637041	-14.57228	7.081214e-21	-6.028305	-4.571695
temperature25	-10.1	0.3637041	-27.76982	8.187867e-35	-10.828305	-9.371695

Putting the ANOVA test into words

Increasing enivornmental temperatures had a clear negative effect on the time taken for frogspawn to hatch (one-way ANOVA: $F_{2,57} = 385.9$, $P < 0.001$). At 13C the mean time to hatching was 26.3 days, this decreased by an average of 5.3 days at 18C and finally by 10.1 days at 25C.

Visualised dataset (Figure 1) previously analysed using ANOVA

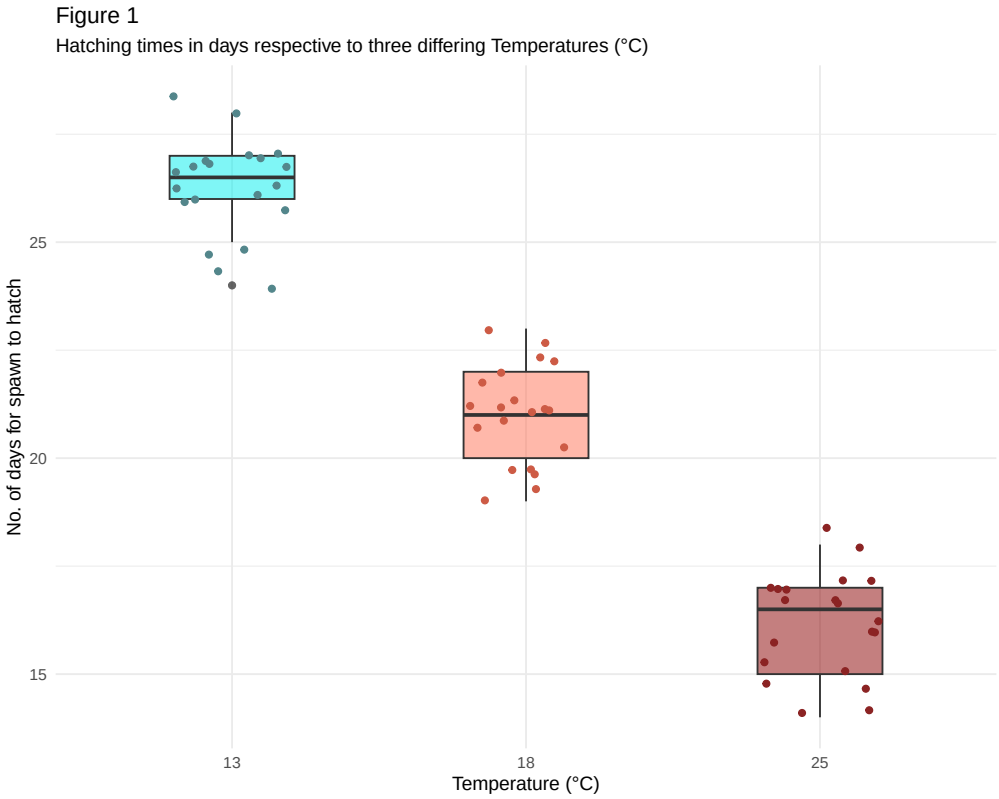

Figure 1: The time in days it takes for frogspawn to hatch in 13, 18 and 25C temperatures. Thick horizontal line is the median with individual points displayed as a jitter.