DATA	FAMILY	DISTRIBUTION	TEST	R-code
Categorical	Chi-squared	Normal Non-normal (or small sample)	Chi-squared Fisher's	chisq.test fisher.test
Continuous (Compare the means of two groups)	T-test	Normal Normal, equal Non-normal, equal Non-normal, unequal	Paired t-test Student's t-test Welch's t-test Wilcoxon t-test	t.test,paired=TRUE t.test t.test,var.equal=FALSE wilcox.test
Continuous (≥Two groups with a particular relationship)	Regression	Normal Normal	Linear regressions Multiple regression	lm(var.1~var.2) lm(var.1~var.2+var.3)
Continuous (1 factor + 1 variable) Continuous (2 factors + 1 variable) Continuous (1 factor + 1 resp. var. + 1 ind. var.) Continuous (1 factor + ≥2 resp. variables) Continuous (≥2 factors + ≥2 resp. var.) Continuous (1 factor + ≥2 resp. var. + 1 ind. var.)	ANOVA (Compare the means of ≥two groups)	Normal Non-normal Normal Non-normal Normal Non-normal Normal Non-normal Normal Non-normal Normal Non-normal	One-way ANOVA Kruskal-Wallis Two-way ANOVA Friedman's test ANCOVA Quade's test One-way MANOVA Multivariate Kruskal-Wallis Two-way MANOVA Multivariate Friedman's test MANCOVA O'Brien's test	aov(var.1~var.2) aov(var.1~var.2) aov(v1~v2+v3+v2:v3) aov(v1~v2+v3+v2:v3) aov(v1~v2+v3+v2:v3) aov(v1~v2+v3+v2:v3) manova(v1,v2~v3) manova(v1,v2~v3) manova(v1,v2~v3,v4) manova(v1,v2~v3,v4) manova(v1~v2+v3+v4) manova(v1~v2+v3+v4)

Chi-squared test	T-Test	Regression	ANOVA
(1) Bring data into R	(1) Bring data into R	(1) Bring data into R	(1) Bring data into R
(2) Visualize data by creating a histogram or boxplot of continuous or ordinal data	(2) Visualize data by creating a histogram or boxplot of both groups	(2) Build a linear model for your data, listing the dependent variable 1st, dependent 2nd (lm(var1~var2, data))	(2) Visualize data by creating a histogram or boxplot for each group
(3) Test normality by running a Shapiro-Wilk test (shapiro.test) on the continuous or ordinal data	(3) If your data is paired (repeated measures), run a Paired t-test (t.test, paired=TRUE) on your data frame	(3) Create a scatterplot (plot) of the data with the dependent variable on the x-axis and independent on the y-axis	(3) Test for normality by running a Shapiro-Wilk test (shapiro.test) on each groups
(4) If data is normally distributed, run a Pearson's chi-squared test (chisq.test) on your data frame	(4) Test for normality by running a Shapiro-Wilk test (shapiro.test) on each of the two groups	(4) Add a regression line to your scatter plot (abline(lm(var1~var2))	(4) 1 factor & 1 variable w/ normal data = one-way ANOVA, w/ non-normal = Kruskal-Wallis test (aov(v1~v2))
(5) If data is not normally distributed, run a Fisher's exact test (fisher.test) on your data frame	(5) Test for equal variance by running a Levene Test (var.test) on each of the two groups	(5) Create a summary (name) of your linear model (name<-lm(var1~var2) to view the R^2 and p-values	(5) 2 factors & 1 variable w/ normal data = two-way ANOVA, w/ non-normal data = Friedman's test (aov(v1~v2+v3+v2:v3))
	(6) If your data is normally distributed and has equal variance, run a Student's T-test (t.test) on your data frame	(6) For multiple regression, build models for different combinations of variables of interest (lm(v1~v2); lm(v1~v3); lm(v1~v4); lm(v1~v2+v3); lm(v1~v2+v3+v4))	(6) 1 factor, 1 response variable, & 1 independent variable w/ normal data = ANCOVA, w/ non-normal = Quade's test (aov(v1~v2+v3+v2:v3))
	(7) If your data is not normally distributed, but has equal variance, run a Welch's t-test (t.test,var.equal=FALSE) on your data frame	(7) Esitmate the best model for explaining variation in your data using Akaike's Information Criterion (AIC) (compareLM(mod1,mod2,mod3)	(7) 1 factor & ≥2 response variables with normal data = one-way MANOVA, with non-normal = multivariate Kruskal Wallis test (manova(v1,v2~v3))
	(8) If your data is not normally distributed and does not have equal variance, run a Wilcoxon signed rank test (wilcox.test) on your data frame	(8) Select the model with the highest AIC value, as the better the model is at explaining the variation in your data, the higher the AIC score	(8) ≥2 factors & ≥2 response variables w/ normal data = two-way MANOVA, w/ non-normal data = multivariate Friedman's test (manova(v1,v2~v3,v4))
		(9) Remember that adding variables automatically increases AIC, so balance choosing the model w/ the highest score w/ the model w/ high score + least variables	(9) 1 factor, ≥2 response variables, & 1 independent variable w/ normal data = MANCOVA, w/ non-normal data = O'Brien's test (manova(v1~v2+v3+v4))

- *If the p-value of a Shapiro-Wilk test is <0.05, reject the null hypothesis that your data is normally distributed*
- *If the p-value of a Levene test is <0.05, reject the null hypothesis that your data has equal variance*
- *If p-value >0.05 accept null hypothesis that there IS NOT a significant difference between the groups*
- *If p-value is <0.05, reject null & accept alternative hypothesis that there IS a significant difference between the groups*