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|  | **Linear regression** | | **Logistic regression** | | **ANOVA** | |
| 1. **When do you use this type of model?** | Use this model to explain or predict a continuous outcome using categorical and/or continuous predictor variable(s). | | Use this model to explain or predict a binary outcome using categorical and/or continuous predictor variable(s). | | Use this model to compare means of a continuous measure across groups from one or two categorical variables. | |
| 1. **What type of variable is the outcome?** | Continuous | | Binary | | Continuous | |
| 1. **What type(s) of variable(s) is/are the predictors?** | Categorical or continuous | | Categorical or continuous | | Categorical | |
| 1. **What are the assumptions & how do you test each one?** | Assumption | How to test it | Assumption | How to test it | Assumption | How to test it |
| Independent observations | Check how the data were collected | Independent observations | Check how the data were collected | Independent observations | Check how the data were collected |
| Continuous outcome | Check measurement | No multicollinearity | GVIF < 4 is ok (recommended cutoff may vary) | Normal distribution of the outcome within groups | Histogram or density plot of groups or of residuals |
| Linearity | Scatterplot of continuous predictors vs. outcome w Loess curve | Linearity | Scatterplot of continuous predictors vs. logit of outcome w Loess curve | Homogeneity of variances | Levene’s test to test the null hypo that the variances are equal across groups |
| Homoscedasticity | Breusch-Pagan test of the null hypo that the variance is constant |  |  | Continuous outcome | Check measurement |
| No multicollinearity | VIF < 5 is ok (recommended cutoff may vary) or correlation < .7 is ok |  |  | Independent groups | Check measurement and data collection |
| Residuals are independent | Durbin-Watson test the null hypo that residuals are independent |  |  |  |  |
| Residuals are normally distributed | Histogram or density plot of residuals |  |  |  |  |
| 1. **What is the test statistic for model significance?** | F-statistic | | Chi-squared | | F-statistic | |
| 1. **What is the measure of model fit/effect size?** | Adjusted R-squared | | Percent correctly predicted | | Omega-squared | |
| 1. **Which diagnostics measures do you use to find outliers & influential values? What are the cutoff values for identifying the outliers/influential values?** | Measure | Cutoff for outliers/infl | Measure | Cutoff for outliers/infl | Measure | Cutoff |
| Standardized residuals | > 1.96 | Standardized residuals | > 1.96 |  |  |
| Leverage values (hat) | > 2p/n where p is the number of parameters in the model | Leverage values (hat) | > 2p/n where p is the number of parameters in the model |
| Cook’s distance | > 4/n | Cook’s distance | > 4/n |
| 1. **How do you identify the most problematic outliers/influential values?** | Identify those that are problematic by more than one measure, review the observations that are problematic to see if there are any data entry issues or other obvious problems that would suggest fixing or dropping observations. | | Identify those that are problematic by more than one measure, review the observations that are problematic to see if there are any data entry issues or other obvious problems that would suggest fixing or dropping observations. | | Identify those that are problematic by more than one measure, review the observations that are problematic to see if there are any data entry issues or other obvious problems that would suggest fixing or dropping observations. | |
| 1. **How do you report the results?** | * Report and interpret each slope:   + Value   + Direction (positive/negative)   + Significance/Confidence interval * Report and interpret model fit * Report and interpret model significance * Assumption checking & diagnostics results | | * Report and interpret for significant predictors:   + Odds ratio   + 95% confidence interval * List non-significant predictors/reference groups * Report and interpret model fit * Report and interpret model significance * Assumption checking & diagnostics results | | * Report and interpret model significance * Report group means and standard deviations * If model is significant, conduct/report/interpret:   + Post-hoc tests / planned comparisons * Report and interpret effect size * Assumption checking results | |

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| 1. **What type of variable is the outcome?** |  | |  | |  | |
| 1. **What type(s) of variable(s) is/are the predictors?** |  | |  | |  | |
| 1. **What are the assumptions & how do you test each one?** | Assumption | How to test it | Assumption | How to test it | Assumption | How to test it |
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| 1. **What is the test statistic for model significance?** |  | |  | |  | |
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| 1. **How do you identify the most problematic outliers/influential values?** |  | |  | |  | |
| 1. **How do you report the results?** |  | |  | |  | |