STAT 102 - Important Code for Week 10 (Theory-Based Inference)

	Mean	**Proportion**	**Difference in means**	**Difference in proportions**	**Correlation**
Standardized test statistic and its theory-based distribution	$t \sim t(df = n - 1)$	$z \sim N(0, 1)$	$t \sim t(df = \min(n_1, n_2) - 1)$, where n_1 = # of observations in group 1, n_2 = # of observations in group 2	$z \sim N(0, 1)$	$t \sim t(df = n - 2)$
Assumptions for CLT	At least 30 observations	At least 10 successes and 10 failures	At least 30 observations in each category	At least 10 successes and 10 failures in each category	At least 30 observations
	Random sampling (i.e., cases are independent)				
Template code for hypothesis testing	`t_test(DATASET, response = RESPONSE_VAR, mu = NULL_VAL, alternative = "SIDE_OF_TEST"`[1]`)`	`prop_test(DATASET, response = RESPONSE_VAR, success = "CAT_OF_INTEREST", p = NULL_VAL, z = TRUE, alternative = "SIDE_OF_TEST"`[2]`)`	`t_test(DATASET, Y ~ X, order = c("CAT_OF_EXPL_VAR", "OTHER_CAT_OF_EXPL_VAR"), alternative = "SIDE_OF_TEST"`[3]`)`	`prop_test(DATASET, Y ~ X, order = c("CAT_OF_EXPL_VAR", "OTHER_CAT_OF_EXPL_VAR"), z = TRUE, success = "CAT_OF_INTEREST", alternative = "SIDE_OF_TEST"`[4]`)`	`cor.test(~ Y + X, data = DATASET, alternative = "SIDE_OF_TEST"`[5]`)`
Example code for hypothesis testing	*`t_test(FloridaLakes, response = pH, mu = 7, alternative = "two.sided")`*	*`prop_test(esp, response = guess, success = "correct", p = 0.25, z = TRUE, alternative = "greater")`*	*`t_test(ACS_adults, HoursWk ~ Married, order = c("1", "0"))`*	*`prop_test(ACS_adults, MarriedCat ~ USCitizenCat, order = c("Citizen", "Not citizen"), z = TRUE, success = "Yes")`*	*`cor.test(~ HoursWk + Age, data = ACS_adults, alternative = "less")`*

[1] "less", "greater", "two-sided"
[2] "less", "greater", "two-sided"
[3] "less", "greater", "two-sided"
[4] "less", "greater", "two-sided"
[5] "less", "greater", "two-sided"

Template code for confidence intervals	`t_test(DATASET, response = RESPONSE_VAR, mu = NULL_VAL, conf_level = CONF_LEVEL)`	`prop_test(DATASET, response = RESPONSE_VAR, success = "CAT_OF_INTEREST", p = NULL_VAL, z = TRUE, conf_level = CONF_LEVEL)`	`t_test(DATASET, Y ~ X, order = c("CAT_OF_EXPL_VAR", "OTHER_CAT_OF_EXPL_VAR"), conf_level = CONF_LEVEL)`	`prop_test(DATASET, Y ~ X, order = c("CAT_OF_EXPL_VAR", "OTHER_CAT_OF_EXPL_VAR"), z = TRUE, success = "CAT_OF_INTEREST", conf_level = CONF_LEVEL)`	`cor.test(~ Y + X, data = DATASET)`
Example code for confidence intervals	*`t_test(adelies, response = flipper_length_mm, mu = 191, conf_level = 0.99)`*	*`prop_test(mcas, response = white_less50, success = "TRUE", p = 0.5, z = TRUE, conf_level = 0.90)`*	*`t_test(mcas, econ_dis ~ white_less50, order = c("TRUE", "FALSE"), conf_level = 0.95)`*	*`prop_test(ACS_adults, MarriedCat ~ USCitizenCat, order = c("Citizen", "Not citizen"), z = TRUE, success = "Yes", conf_level = 0.95)`*	*`cor.test(~ HoursWk + Age, data = ACS_adults)`*