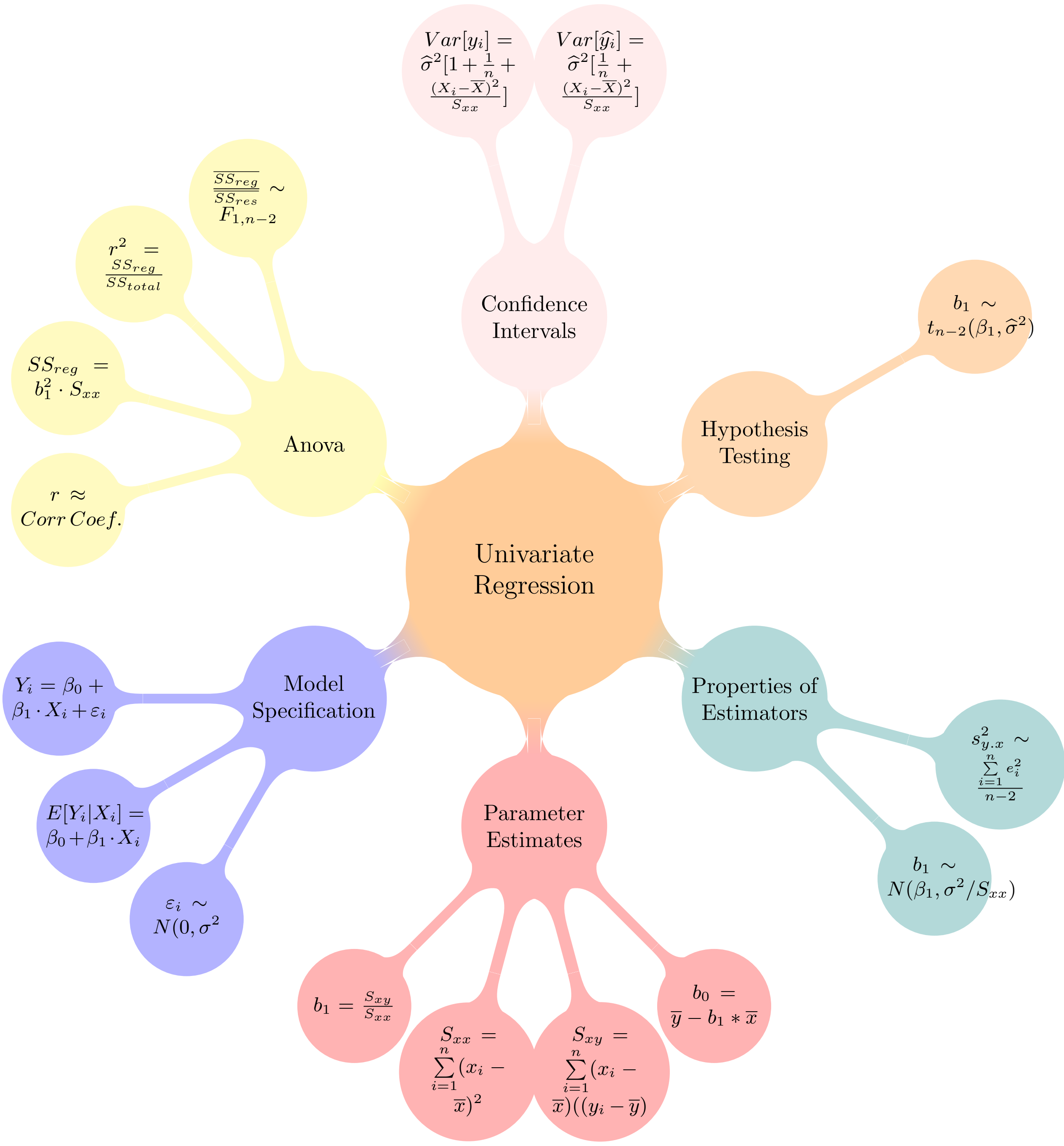

Univariate Regression
Confidence Intervals
$Var[y_i] = \widehat{\sigma}^2[1 + \frac{1}{n} + \frac{(X_i - \overline{X})^2}{S_{xx}}]$
$Var[\widehat{y}_i] = \widehat{\sigma}^2[\frac{1}{n} + \frac{(X_i - \overline{X})^2}{S_{xx}}]$
Hypothesis Testing
$b_1 \sim t_{n-2}(\beta_1, \widehat{\sigma}^2)$
Properties of Estimators
$s^2_{y.x} \sim \frac{\sum_{i=1}^{n} e_i^2}{n-2}$
$b_1 \sim N(\beta_1, \sigma^2 / S_{xx})$
Parameter Estimates
$b_1 = \frac{S_{xy}}{S_{xx}}$
$S_{xx} = \sum_{i=1}^{n}(x_i - \overline{x})^2$
$S_{xy} = \sum_{i=1}^{n}(x_i - \overline{x})((y_i - \overline{y})$
$b_0 = \overline{y} - b_1 * \overline{x}$
Model Specification
$Y_i = \beta_0 + \beta_1 \cdot X_i + \varepsilon_i$
$E[Y_i|X_i] = \beta_0 + \beta_1 \cdot X_i$
$\varepsilon_i \sim N(0, \sigma^2$
Anova
$\frac{\overline{SS_{reg}}}{\overline{SS_{res}}} \sim F_{1,n-2}$
$r^2 = \frac{SS_{reg}}{SS_{total}}$
$SS_{reg} = b_1^2 \cdot S_{xx}$
$r \approx Corr Coef.$