Dealing with unknown variance: Student's t distribution:

$\boldsymbol{T = \frac{\overline{X}-\mu_0}{S/\sqrt{n}} \sim t_{n-1}}$ **. $\boldsymbol{H_0: \mu = \mu_0}$ versus $\boldsymbol{H_1: \mu \neq \mu_0}$ at the $\boldsymbol{\alpha}$ level.**

Rejection region of observed test statistic $t = \frac{\overline{X}-\mu_0}{S/\sqrt{n}}$ is then give

by $R = \left(-\infty, -t_{n-1,\frac{\alpha}{2}}\right) \cup \left(t_{n-1,\frac{\alpha}{2}}, \infty\right).$