1 Regulated 10 V\textsubscript{DC} Supply
A single regulated supply powers every transmitter component. Receiver components use a separate supply.
1. Isolate two separate sets of 0 V and 10 V supply rails on your breadboard (or use two breadboards).
2. Connect LM317 regulated output to transmitter supply rail.
3. Connect unregulated DC supply (e.g., 15 V\textsubscript{DC}) to LM317 input. Make connection easy to find later.
4. A \textbf{large} bypass capacitor (e.g., 1–10 \(\mu\text{F}\)) may be placed \textit{near} LM317 from \texttt{Adjust} to ground.
5. A \(\sim 0.1 \mu\text{F}\) bypass capacitor to ground can be placed at the 10 V input to each circuit component.

\[
\begin{align*}
V_{\text{unreg}} &\approx 15 \text{ V}\text{DC} \\
R_1 &\approx 220 \Omega \\
R_2 &\approx 1.54 \text{k}\Omega \\
C_{\text{reg}} &\geq 1 \mu\text{F} \\
C_{\text{unreg}} &\geq 0.1 \mu\text{F}
\end{align*}
\]

\[V_{\text{reg}} = 10 \text{ V}\text{DC}\]

Because power supply is connected by long wires, input bypass capacitor \(C_{\text{unreg}}\) is \textbf{highly recommended}.

Optional output bypass capacitor \(C_{\text{reg}}\) will help keep \(V_{\text{reg}}\) steady.

\[
\begin{align*}
V_{\text{unreg}} &\approx 15 \text{ V} \\
C_{\text{unreg}} &\geq 0.1 \mu\text{F} \\
V_{\text{reg}} - 1.25 \text{ V} &\approx 15 \text{ V} \\
R_2 &\approx 1 \text{k}\Omega \\
R_1 &\approx 220 \Omega
\end{align*}
\]
A  Parts

(a) **LM317** 3-terminal adjustable regulator

(b) Electrolytic capacitor

Figure A.1: Part pin-outs.