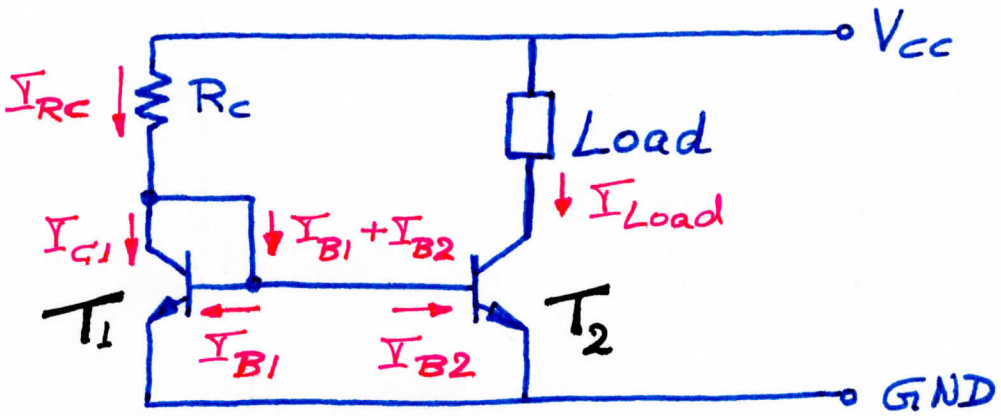
# Iconic circuit: Current mirror




Assume $T_1$ & $T_2$ have the same properties: $\beta_1 = \beta_2 = \beta$

Function: The current through the LHS branch is mirrored (replicated) to the RHS branch

LHS = Left hand side  RHS = Right hand side

Q: $V_{BE}$ of $T_1$ & $T_2$ exactly the same?

Q: $I_{B1} = I_{B2}$ ?

Q: $V_{BE1} = ?$  $V_{BE2} = ?$

Q: What is $V_{CE}$ of $T_1$?

Q: Is $T_1$ in saturation or forward active?

$\Rightarrow$ $I_{C1} = \beta I_{B1}$  $I_{C2} = \beta I_{B2}$

Q: What is current through $R_C$?

$$I_{RC} = I_{CL} + I_{B1} + I_{B2} = \beta I_{B1} + 2 I_{B1}$$

$$= I_{B1}(\beta + 2) \approx \underline{\beta I_{B1}}$$

Q: What is current through Load?

$$I_{Load} = I_{C2} = \beta I_{B2} = \underline{\beta I_{B1}}$$

$$\Rightarrow \quad \boxed{I_{Load} \approx I_{RC}}$$