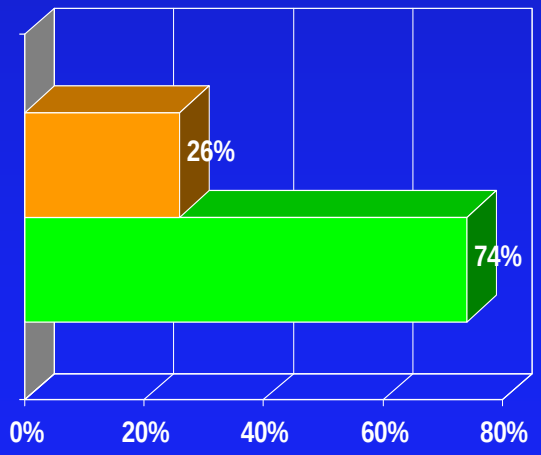
Preflights 1-3

Consider a hypothetical device that takes 1000 J of heat from a hot reservoir at 300K, ejects 200 J of heat to a cold reservoir at 100K, and produces 800 J of work.

Does this device violate the first law of thermodynamics ?

1. Yes "the change in U=Q+W "
2. No ⟵ correct

- $-W\ (800) = Q_{hot}\ (1000) - Q_{cold}\ (200)$
- $\text{Efficiency} = -W/Q_{hot} = 800/1000 = 80\%$



80% efficient
20% efficient
25% efficient