نمونه کد شبیه‌سازی سیکل رانکین

```
"Rankine Cycle Analysis"
"Input Parameters"
P_boiler = 8000 [kPa]        "Boiler pressure"
T_turbine_in = 500 [C]       "Turbine inlet temperature"
P_condenser = 10 [kPa]       "Condenser pressure"
m_dot = 1 [kg/s]             "Mass flow rate"

"State 1: Condenser Exit (Saturated Liquid)"
h1 = enthalpy(Water, P=P_condenser, x=0)
s1 = entropy(Water, P=P_condenser, x=0)
T1 = temperature(Water, P=P_condenser, x=0)

"State 2: Pump Exit (Isentropic Compression)"
s2 = s1                      "Isentropic process"
P2 = P_boiler
h2 = enthalpy(Water, P=P2, s=s2)
T2 = temperature(Water, P=P2, s=s2)

"State 3: Boiler Exit / Turbine Inlet"
P3 = P_boiler
T3 = T_turbine_in
h3 = enthalpy(Water, P=P3, T=T3)
s3 = entropy(Water, P=P3, T=T3)

"State 4: Turbine Exit (Isentropic Expansion)"
s4 = s3                      "Isentropic process"
P4 = P_condenser
h4 = enthalpy(Water, P=P4, s=s4)
T4 = temperature(Water, P=P4, s=s4)
x4 = quality(Water, P=P4, s=s4) "Quality at turbine exit"

"Energy Transfers per Unit Mass [kJ/kg]"
w_pump = h2 - h1             "Pump work input"
w_turbine = h3 - h4          "Turbine work output"
q_in = h3 - h2               "Heat added in boiler"
q_out = h4 - h1              "Heat rejected in condenser"

"Performance Parameters"
eta_th = (w_turbine - w_pump) / q_in  "Thermal efficiency"
W_net = m_dot * (w_turbine - w_pump)  "Net power output [kW]"

"Optional: Work Ratio"
Work_ratio = (w_turbine - w_pump) / w_turbine  "Net work to turbine work ratio"

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نمونه کد شبیه‌سازی سیکل اتو

```
"Otto Cycle Analysis"

"Input Parameters"
r = 8 "Compression ratio"
k = 1.4 "Specific heat ratio (gamma)"
T1 = 300 [K] "Initial temperature"
P1 = 100 [kPa] "Initial pressure"
q_in = 500 [kJ/kg] "Heat added per unit mass"
cv = 0.718 [kJ/kg-K] "Specific heat at constant volume for air"

"Process 1-2: Isentropic Compression"
T2 = T1 * r^(k-1)
P2 = P1 * r^k

"Process 2-3: Constant Volume Heat Addition"
q_in = cv*(T3 - T2)
P3 = P2 * (T3 / T2)

"Process 3-4: Isentropic Expansion"
T4 = T3 / r^(k-1)
P4 = P3 / r^k

"Process 4-1: Constant Volume Heat Rejection"
q_out = cv*(T4 - T1)

"Cycle Performance"
w_net = q_in - q_out
eta = (w_net / q_in) * 100 "Thermal efficiency (%)"

"State Points Output"
//{Output:
T1, P1,
T2, P2,
T3, P3,
T4, P4,
q_in, q_out,
w_net, eta}//

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```