```
T_guess = 42 + 273 'initial guess
Delta = 150 'Initial delta to get loop started
sigma = 0.0000000567 'The Stepan-Boltzmann Constant
platee = 0.95 'Plate Emissivity
covere = 0.88 'Cover Emissivity
Tp = 120 + 273 ' Average temperature of plate in K
Ta = 10 + 273 'Ambient temp in K
hcca = 20 'Convective heat transfer to ambient
tilt = 45*3.141593/180 'tilt in radians
Count = 0 'I want to see how efficient we are
do while Delta > 0.001 'Converging criteria
    Count = Count + 1 'What happens when I run out of toes?
    Deltatemp = Tp  - T_guess 'Temp between plate and "Guess temp"
    TempSum = Tp  + T_guess 'Sum for later
    TempAvg = TempSum/2 'Average temp between them (mainly for fluid properties)
    beta = 1/TempAvg 'Beta for a perfect gas
    viscosity = (7e-11)*TempAvg*TempAvg + (6e-8)*TempAvg-(7e-6) 'viscosity at the temp (from
    excel)
    Ra = 9.81*Deltatemp*(0.025^3)*1.4/(TempSum*viscosity*viscosity) 'Raleigh Number
    First_term = 1-1708/(Ra*cos(tilt)) 'First positive-only term in the Nusselt number from
    3.11.4
    if First_term < 0 then 'making it zero if we get a negative number.
        First_term = 0
    End if
    Second_term = ((Ra*cos(tilt)/5830)^(1/3))-1 'Second positive-only term in the Nusselt
    number from 3.11.4
    If Second_term <0 then 'Making it Zero if we get a negative number
        Second_term = 0
    End if
    Nu = 1+1.44*(1-(1708*(sin(1.8*tilt)^1.6)/(Ra*cos(tilt))))*First_term + Second_term 'Nusselt
    number
    hccp = Nu*0.03/0.025 'Convective heat transfer between plate and cover
    hrcp = sigma*(Tp*Tp+T_guess^2)*(Tp+T_guess)/((1/platee)+(1/covere)-1) 'Radiative heat
    transfer between plate and cover
    hrca = covere*sigma*(T_guess^2+Ta^2)*(T_guess+Ta) 'Radiative heat transfer between ambient
    and

    Ut = ((1/(hccp+hrcp))+(1/(hcca+hrca)))^(-1) 'Top loss Coefficient
    Tc = Tp-Ut*(Tp-Ta)/(hccp+hrcp) 'New temp of cover
    Delta = abs(Tc-T_guess) 'Calculating the delta for convergance
    T_guess = Tc 'Incrementing the guess for the rest of the loop
loop

Msgbox "In " & Count & " Loops, we found the following:" 'just telling me what we have found in
our travels
Msgbox "hccp: " & hccp & " hrcp: " & hrcp & " hrca: " & hrca
MsgBox "Top Loss Coefficient: " & Ut & " Plate Temp: " & T_guess
```