stack "PFR With Heat Exchange" (id 80548)
 of stack "PFR With Heat Exchange"

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# --------------

on startMeUp # new for net version, called in openStack
  global labNumber
  # set up list of support files
  # any file can be optionally gzipped
  # make sure .gz extension agrees with posted file!
  put labNumber & "_info.livecode" into tFileList
  initModuleFiles tFileList # in Directory stack
  checkForConferenceRoom -- in RL scripts 1
end startMeUp

# --------------

on setMe
 go to card 1
 set the customFirstEntry of this stack to "false"
 set the customEnabled of button "go lab" to "false"
 set the customEnabled of button "go lab quiz" to "true"
end setMe

# --------------

on openStack
 global gCurrentCard
 if gCurrentCard is empty then
  go to card 1
 end if
 setTitle
 startMeUp # new for net
end openStack

# --------------

on resumeStack
 global gCurrentCard, replotLab
 # only for labs with standard thumbnail plots
 if the number of this cd is gCurrentCard then
  if replotLab is true then  # set to true in Plot stack x,y btns
    setInfo "Plotting..."
    plotAllPoints
    setInfo empty
    put false into replotLab
  end if
 end if
end resumeStack

# ---------------

function rk4 dv, k300, Ea, UA, Tj, vol, MC, H, cin, flow, tX, tT

 put deriv (dv, k300, Ea, UA, Tj, vol, MC, H, cin, flow, tX, tT) into temp
 put item 1 of temp into dXdv1
 put item 2 of temp into dTdv1

 put deriv (dv, k300, Ea, UA, Tj, vol, MC, H, cin, flow, tX+dXdv1*dv/2, tT+dTdv1*dv/2) into temp
 put item 1 of temp into dxdv2
 put item 2 of temp into dTdv2

 put deriv (dv, k300, Ea, UA, Tj, vol, MC, H, cin, flow, tX+dXdv2*dv/2, tT+dTdv2*dv/2) into temp
 put item 1 of temp into dxdv3
 put item 2 of temp into dTdv3
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  put deriv (dv, k300, Ea, UA, Tj, vol, MC, H, cin, flow, tX+dXdv3*dv, tT+dTdv3*dv) into temp
  put item 1 of temp into dxdv4
  put item 2 of temp into dTdv4

  put (dXdv1/6 + dXdv2/3 + dXdv3/3 + dXdv4/6) into dXdv

#  answer dxdv1 &cr& dXdv2 &cr& dXdv3 &cr& dXdv4 &cr& dXdv # xxx
#  wait 2 seconds # xxx

  put (dTdv1/6 + dTdv2/3 + dTdv3/3 + dTdv4/6) into dTdv

#  answer dTdv1 &cr& dTdv2 &cr& dTdv3 &cr& dTdv4 &cr& dTdv # xxx
#  wait 2 seconds # xxx

  put dXdv into item 1 of thisResult
  put dTdv into item 2 of thisResult
  return thisResult

end rk4

# ---------------

function deriv dv, k300, Ea, UA, Tj, vol, MC, H, cin, flow, tX, tT

  put k300*exp((Ea/R_kJ_molK())*((1/300) - (1/tT))) into k
  put (k*(1 - tX)/flow) into dXdv
  put (UA*(Tj - tT)/(vol*MC) - H*k*cin*(1 - tX)/MC) into dTdv

  put dXdv into item 1 of thisResult
  put dTdv into item 2 of thisResult
  return thisResult

end deriv
```