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quadrature.f90

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module quadrature
  use iso_fortran_env, only: wp=> real64
  implicit none
contains

  real(wp) function quad_rectangulo(h,table)
    ! -----
    ! Regla del rectangulo
    ! -----
    real(wp), intent(in) :: h
    real(wp), intent(in) :: table(:)
    ! -----
    integer :: n
    n = size(table)
    ! -----
    quad_rectangulo = h*sum(table(1:n-1))
    ! -----
  end function quad_rectangulo

  real(wp) function quad_trapecio(h,table)
    ! -----
    ! Regla del trapecio
    ! -----
    real(wp), intent(in) :: h
    real(wp), intent(in) :: table(:)
    ! -----
    integer :: n
    n = size(table)
    ! -----
    quad_trapecio = h*((table(1)+table(n))/2.0_wp + &
      & sum(table(2:n-1)))
    ! -----
  end function quad_trapecio

  real(wp) function quad_simpson(h,table)
    ! -----
    ! Regla de simpson
    ! -----
    real(wp), intent(in) :: h
    real(wp), intent(in) :: table(:)
    ! -----
    integer :: n
    n = size(table)
    ! -----
    quad_simpson = (h/3.0_wp)*(table(1)+table(n)+ &
      & 2.0_wp*sum(table(3:n-2:2)) + &
      & 4.0_wp*sum(table(2:n-1:2)))
    ! -----
  end function quad_simpson

end module quadrature

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