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! -----
subroutine Maximum(u,umax)
! -----
!
! Description: Subroutine to calculate  $||u||_{\infty} = \max |u|$ 
!
! -----

use header
implicit none
include "mpif.h"

type(Vector), intent(inout) :: u
real(kind=8), intent(out)   :: umax

real(kind=8) :: mymax
integer :: ierr

mymax = maxval(u%xx(u%ibeg:u%iend))

call MPI_Reduce(mymax,umax,1,MPI_DOUBLE_PRECISION,MPI_MAX,0, &
                MPI_COMM_WORLD,ierr)

end subroutine Maximum
```