CODE:

```
Program main

implicit none
character(50)::filename1, filename2
integer :: size1, size2, size3
real, allocatable :: array1(:), array2(:), array3(:)



!ask for 1st file
print *, "First Array"
call read_file(filename1,array1,size1)
call write_array(array1,size1)

print *," "
print *," "
print *," "




!ask for 2nd file
print *, "Second Array"
call read_file(filename2,array2,size2)
call write_array(array2,size2)

print *," "
print *," "
print *," "



!merge 2 arrays and output
print *, "Merged Array"
call merge_array(array1,size1,array2,size2,array3,size3)
call write_array(array3,size3)
```

```
contains
!subroutine to read file
Subroutine read_file(filename, array, size)

   implicit none
   !declare variables
   real, allocatable :: array(:)
   integer :: size, i, iostat
   character(50)::filename

   !ask for file name
   print *, "What is the name of the data file? "
   read *, filename

   !open filename on unit 10
   open (unit=10, file = filename,iostat = iostat)

   !check if the input output is nonzero
   if(iostat /= 0) stop 'Error opening file'

   size = 0

   !read file, check error, increase size
   do
      read (10, *, iostat = iostat)
      if (iostat /= 0) exit
      size = size + 1

   end do

   rewind(10)

   !read data into array
   allocate (array(size))
   do i = 1, size
      read(10,*)array(i)
   end do

   close(10)


end subroutine
```

```
! subroutine to write contents of array
subroutine write_array (array, array_size)

   implicit none
   integer :: array_size, i
   real, allocatable :: array(:)


   print *, array_size, " Elements in this array: "
   !print *, array
   do i =1, array_size
      write(*,'(F7.3,$)') array(i)
   end do


end subroutine write_array

!subroutine to merge 2 arrays
subroutine merge_array(array1,size1,array2,size2,array3,size3)
implicit none
integer :: size1, size2, size3, i1,i2,i3
real, allocatable :: array1(:), array2(:), array3(:)
i1 = 1
i2 = 1
i3 = 1

size3 = size1+ size2
allocate(array3(size3))

!compare each element in both array and move on until reach the end
do while (i1 <= size 1 .and. i2<= size2)
   if (array1(i1) <= array2(i2)) then
      array3(i3) = array1(i1)
      i1 = i1+1
   else
      array3(i3) = array2(i2)
      i2 = i2 +1
   end if
   i3= i3 +1
end do

!copy the rest of the other array to third array

if (i1 > size1) then
```

```
      do i2 = i2, size2
         array3(i3) = array2(i2)
         i3 = i3 + 1
      end do
   else
      do i1 = i1, size1
         array3(i3) = array1(i1)
         i3 = i3 + 1
      end do
   end if
   end subroutine

   End program main
```

OUTPUT SCREENSHOT:

```
 First Array
 What is the name of the data file?
lista.txt
           8  Elements in this array:
  2.000  4.000  4.000  6.000  8.000  8.000 10.000 14.000


 Second Array
 What is the name of the data file?
listb.txt
           8  Elements in this array:
  3.000  5.000  5.000  7.000  9.000  9.000 11.000 13.000


 Merged Array
          16  Elements in this array:
  2.000  3.000  4.000  4.000  5.000  5.000  6.000  7.000  8.000  8.000  9.000  9.000 10.000 11.000 13.000 14.000
```

```
 First Array
 What is the name of the data file?
lista.txt
          11  Elements in this array:
  2.000  4.000  4.000  6.000  8.000  8.000 10.000 14.000 16.000 16.000 20.000


 Second Array
 What is the name of the data file?
listb.txt
          13  Elements in this array:
  3.000  5.000  5.000  7.000  9.000  9.000 11.000 13.000 15.000 15.000 17.000 17.000 19.000


 Merged Array
          24  Elements in this array:
  2.000  3.000  4.000  4.000  5.000  5.000  6.000  7.000  8.000  8.000  9.000  9.000 10.000 11.000 13.000 14.000 15.000 15.000 16.000 16.000 17.000 17.000 19.000 20.000
```