Modules

- A **module** may contain
  - variable declarations
  - functions and subroutines
- It need not be in the same file as the main program.

  If it is the same fi le as the main program, it must precede it.
- A module is invoked by "`USE <mname>`" at the beginning of the main program (or another module).

Example MODULE code

```
MODULE norm_mod
  IMPLICIT NONE
CONTAINS
  REAL(8) FUNCTION mynorm(xv, yv, zv) RESULT(res)
    REAL(8), INTENT(IN) :: xv, yv, zv ! INTENT attribute for
    REAL(8)             :: a          ! a variable internal
    a = xv**2 + yv**2 + zv**2         ! do some arithmetic
    res = SQRT(a)                     ! assign the dummy res
  END FUNCTION mynorm
END MODULE norm_mod

PROGRAM norm3
  USE norm_mod
  IMPLICIT NONE
  REAL(8) :: a, x, y, z               ! coordinates
  PRINT*, 'Enter three coordinates.'
  READ*, x, y, z
  a = mynorm(x, y, z)                 ! call function
  PRINT*, a
END PROGRAM norm3
```

Example: multiple source files

- We'll put the module norm_mod and the main program from the source file above into two files:

```
norm_mod.f90
norm4.f90
```

- Compile with the command

```
f90 -o norm4.out norm_mod.f90 norm4.f90
```

- Module source should be on command line before main program line.