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Advanced Fortran Programming

March 26-28, 2019

CSC – IT Center for Science Ltd, Finland

```
type revector(rk)
  integer, kind :: rk
  real(kind=rk), allocatable :: data(:)
  contains
    procedure :: sum => vecsum
    generic :: operator(+) => sum
end type revector

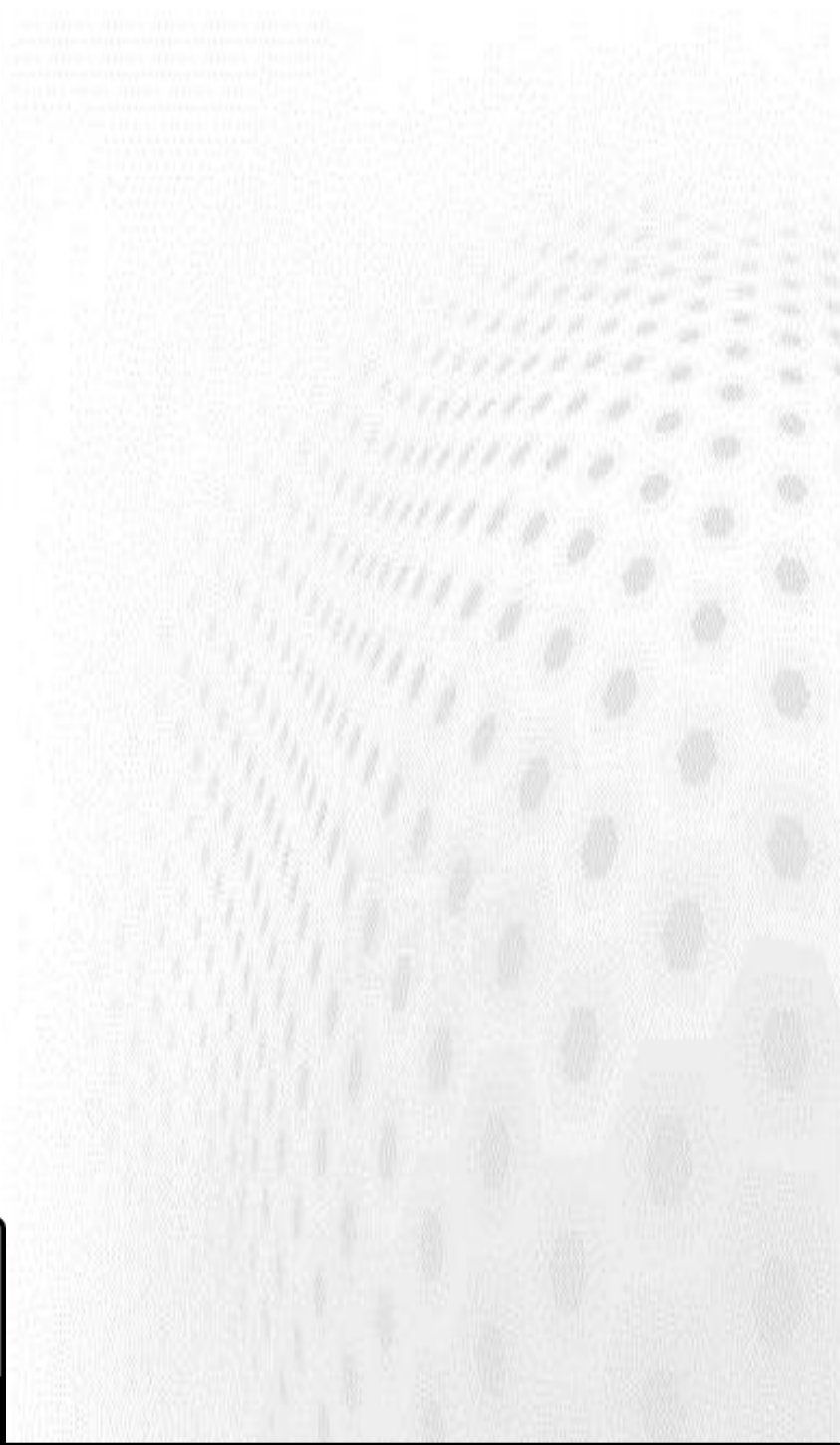
type, extends(revector) :: imvector
  real(kind=rk), allocatable :: imdata(:)
  contains
    procedure :: sum => imvecsum
end type imvector

contains

function vecsum(x,y) result(z)
  implicit none

  class(revector(dp)), intent(in) :: x,y
  class(revector(dp)), allocatable :: z
  integer :: i

  select type(y)
```



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Agenda

Tuesday

9:00-9:15	Course introduction
9:15-10:00	Useful new features beyond F95
10:00-10:15	Coffee break
10:15-11:00	Advanced topics in Fortran I/O
11:00-11:15	Working with Fortran compilers
11:15-12:00	Exercises
12:00-13:00	Lunch break
13:00-14:00	Interoperability with C
14:00-14:45	Exercises
14:45-15:00	Coffee break
15:00-16:00	Exercises

Thursday

9:00-10:00	Additional capabilities of Fortran types, procedure pointers
10:00-10:15	Coffee break
10:15-11:00	Exercises
11:00-12:00	Type extensions, type-bound procedures
12:00-13:00	Lunch break
13:00-14:00	Exercises
14:00-14:45	Complex data structures with Fortran
14:45-15:00	Coffee break
15:00-15:45	Exercises
15:45-16:00	Course wrap-up

Wednesday

9:00-9:45	Introduction to Fortran coarrays
9:45-10:00	Coffee break
10:00-11:15	Exercises
11:15-12:00	More coarray features
12:00-13:00	Lunch break
13:00-14:00	Exercises
14:00-14:45	Advanced topics in coarrays
14:45-15:00	Coffee break
15:00-16:00	Exercises

Web resources

- CSC's Fortran95/2003 Guide (in Finnish) for free
<https://goo.gl/DnTSLK>
- Fortran wiki: a resource hub for all aspects of Fortran programming
<http://fortranwiki.org>
- About Fortran standard evolution over few decades
<http://fortranwiki.org/fortran/show/Fortran+2008>
<http://fortranwiki.org/fortran/show/Fortran+2003>
<http://fortranwiki.org/fortran/show/Fortran+95>
<http://fortranwiki.org/fortran/show/Fortran+90>
<http://fortranwiki.org/fortran/show/FORTRAN+77>
<http://fortranwiki.org/fortran/show/FORTRAN+66>
- GNU Fortran online documents, version 7.3.0
<https://gcc.gnu.org/onlinedocs/gcc-7.3.0/gfortran/>
- Cray documentation, where to search for Fortran compiler reference
<http://docs.cray.com>
- Intel Fortran compilers
<http://software.intel.com/en-us/fortran-compilers>
- G95 Fortran compiler and about its coarray support
<http://www.g95.org>
<http://www.g95.org/coarray.shtml>
- Fortran code examples
<http://www.nag.co.uk/nagware/examples.asp>
<http://www.personal.psu.edu/jhm/f90/progref.html>
- Mistakes in Fortran 90 Programs That Might Surprise You
<http://www.cs.rpi.edu/~szymansk/OOF90/bugs.html>
- Coarrays references
http://www2.hpcl.gwu.edu/pgas09/tutorials/caf_tut.pdf
<http://www.co-array.org>
<ftp://ftp.nag.co.uk/sc22wg5/N1801-N1850/N1824.pdf>
http://en.wikipedia.org/wiki/Coarray_Fortran
<http://gcc.gnu.org/wiki/Coarray>