

PH502: Scientific Programming Concepts

Irish Centre for High End Computing (ICHEC)

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- There are four basic variable types:
 1. integer,
 2. real or floating point,
 3. character or string,
 4. logical.
- By default C has no logical variable, it is represented as an integer.
- FORTRAN has no character variable but is a string of length 1.
- C has no string variable but uses an array of characters with a termination character (NUL).

- For each of these types there are arithmetic operators.
- Integer arithmetic is exact and thus useful for counting, as long as the result is within the range of numbers that can be represented.
- The exception to this is division. Integer division returns an integer, all decimal results are truncated.
- Floating point arithmetic is not exact, this can lead to incorrect results.
- Logical variables have two values True or False. The logical operators require True or False inputs and return either True or False.
- Character arithmetic is possible, we shall discuss this later.

Operator	Description
()	brackets
!	logical not
++, --	add/remove 1
*, /	multiply/divide two numbers
%	
+, -	add/subtract two numbers
<, <=	less than/or equal
>, >=	greater than/or equal
==, !=	equal to/not equal
&&,	logical And/Or
=	assignment

Operator	Description
()	brackets
**	to the power of
*, /	multiply/divide two numbers
+, -	add/subtract two numbers
.LT., .LE.	less than/or equal
.GT., .GE.	greater than/or equal
.EQ., .NE.	equal to/not equal
.NOT.	logical Not
.AND.	logical And
.OR.	logical Or
=	assignment