

Quickly Master Fortran77

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Quickly Master Fortran77

- F77 programming has to account columns
 - column 1 for comments
 - column 2-7 for label
 - column 6 for continue a line
 - column 8 to 72 for programming lines
- Create Variable
 - naming: meaningful, case non-sensitive
 - type: integer, real, logical, character
 - implicit: a-h, o-z are reals; i-m are integers
 - precision: single and double

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- subroutines
 - name, argument list match, referencing or alias
 - return non value
- Function
 - name, argument list match, referencing and alias
 - return one value
- Calling and called subroutines or functions

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- Program starts and closes
 - program
 - end
- formats of data variables:
 - integer: 2, -4, 932
 - real: 2.0, -2.3445, +0.123, 3e+2, -3.4e-4
 - character: 'climate is bad'
- arithmetic operation: +, -, *, /, **
- assignment: =

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- priority: $()$, $**$, $*$ or $/$, $+$ or $-$
- math functions: $\text{abs}(x)$, $\text{acos}(x)$, $\text{int}(x)$, $\text{anint}(x)$, $\text{asin}(x)$, $\text{atan}(x)$, $\text{atan2}(x)$, $\text{cos}(x)$, $\text{cosh}(x)$, $\text{dim}(x)$, $\text{exp}(x)$, $\text{log}(x)$, $\text{log10}(x)$, $\text{max}(x)$, $\text{min}(x)$, $\text{mod}(x)$, $\text{sign}(x,y)$, $\text{sin}(x)$, $\text{sqrt}(x)$, $\text{sinh}(x)$, $\text{tan}(x)$, $\text{tanh}(x)$
- input and output:
 - read *
 - print*

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- converting:
 - `int(x)`
 - `nint(x)`, round off
 - `real(I)`
- Formatting specifiers:
 - integer: [number] I. [digital]
 - real: [number] F (or E). [digital]
 - spacing: number X

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- More about input and output
 - read (*,label) variable(s)
 - read (7,label) variable(s)
 - write(*,label) variable(s)
 - write(9,label) variables

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- Program control
 - if (...) statement
 - if (...) then
 - ...
 - end if
 - do label index=1,N,2
 - ...
 - label continue

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- Program control

- if (...) then

- ...

- else if then

- ...

- end if

- pause 'message'

- stop

- return

- call

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- subroutines and functions
 - match arguments
 - non return and return value
 - definitions of subroutine (or function)
 - return end

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- array
 - one dimensional array
 - two dimensional array
 - dimension name1(limits), name2(limits,limits)
 - dimension name(0:limits)
 - use real just like dimension
 - parameter (limit=100, length=20) can be used before declaration of an array

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- Data statement
 - DATA variableName/value/
 - DATA arrayName/...,...,...,.../
 - array as argument passing to subroutines of functions

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- Sharing data
 - common statement
 - `PARAMETER(NX=10,NY=20)`
 - `COMMON P,Q, S(NX,NY)`
- block common
 - `COMMON /BLOCKNAME/P,Q,S`

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- Equivalence
 - EQUIVALENCE (NSTUDENT, NS,SIZE)

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- Characters
 - character initial
 - character*4, shortName

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- Precision
 - double: double precision a
 - single: real
 - implicit real (I)

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- logical
- file input and output
 - OPEN (8, FILE="DDD",
FORMAT="UNFORMATTED)

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- go to label (or goto label), skip location
- logical statement
 - if (...) statement
 - if (...) then
 - ...
 - endif
- logical operators: .EQ., .LT., .GT., LE., .GE., .NE., .AND., .OR., .NOT.