Formatted Output

What we know:

write(*,*) x
print *, x

General Form:

write (*unit, format, options*) list
unit = * : write to the monitor
format = *: no specified format or free format

or

print *format*, list

Formatted output:

```
      WRITE ( *, 150 ) X
150   FORMAT ( 1X, F5.2 )

      WRITE ( *, '( 1X, F5.2 )' ) X
```

```
□□1.00
□□□□□□
```

Letter Code for Formatting

a: character data

I: integer data (I8: 8 spaces)

F: real data in decimal notation

(F12.4 : total number of spaces is 12, 4 digits after the decimal point)

E: real data in scientific notation (E12.4)

x: space (5x: 5 empty spaces)

```
      WRITE ( *, 150 ) X
150   FORMAT ( 1X, F5.2 )

      WRITE ( *, 100 ) 55, 55.0, 55.0
100   FORMAT ( 1X, 'I, F and E format: ', I3, 1X, F5.2, 1X, E10.2 )
```

This outputs (to the screen) the line

#I, F and E format: #55#55.00###0.55E+02

Note: # indicates an empty space, which is not in a text string.

Formatted Output-examples

1)

```
      WRITE ( *, 100 ) 55, 55.0, 55.0
100   FORMAT ( 1X, 'I, F and E format: ', I3, 1X, F5.2, 1X, E8.2 )
```

2)

```
      WRITE ( *, 100 ) 'I, F and E format: ', 55, 55.0, 55.0
100   FORMAT ( 1X, A, I3, 1X, F5.2, 1X, E8.2 )
```

3)

```
      I = 55
      F = 55.0
      E = 55.0
      WRITE ( *, 100 ) 'I, F and E format: ', I, F, E
100   FORMAT ( 1X, A, I3, 1X, F5.2, 1X, E8.2 )
```

Are the outputs same? Yes.

Formatted Input

What we know:

read(*,*) a, b, c
read *, a, b, c

General Form:

read (*unit, format, options*) variable_list
unit = *: read from keyboard
format = *: no specified format or free format

or

read *format*, variable_list

Formatted input:

READ (*, 100) a, b, c
100 **FORMAT** (3F10.2)

Which are the correct inputs from keyboard?

1 2 3
1,2,3
1.0, 2.0,3.0
1.00, 2,00, 3.00
1.000, 2.000, 3.000

Disk I/O

General form:

OPEN ([UNIT=] unit, FILE = file_name [, specifiers])
READ (unit, format [, options]) variable_list
WRITE (unit, format [, options]) list
CLOSE ([UNIT=] unit [, STATUS = status])

[ ]: optional

Example:

```
      PROGRAM NEWDATAFILE
      OPEN (UNIT=14,FILE='fred.DAT', STATUS='NEW')
                                          ! open fred.DAT and link it to unit=14
      WRITE (*,*)  ' TYPE IN A LIST OF REAL NUMBERS,ENDING WITH A LETTER'
100   READ (*,1000,ERR=101)X              ! input from keyboard
      WRITE (*,1000) X                    ! output to monitor screen
      WRITE (14,1000) X                   ! output to fred.DAT
      GOTO 100
101   CLOSE(14)                           ! close fred.DAT
1000  FORMAT (F12.3)
      END
```

Disk I/O

How to read data from fred.DAT?

```
      N=0
      OPEN (UNIT=14,FILE='fred.DAT', STATUS='OLD')
100   READ(14, 1000, ERR=101) X          ! trapping input errors
      N = N + 1
      GOTO 100
101   CLOSE(14)
```