
Exercise 2-15: Consider the following FORTRAN SUBROUTINE:
SUBROUTINE TEST (X, Y, Z)
X = 1
Z = X + Y
RETURN
END
and consider the following code fragment:
N = 2
CALL TEST (N, N, M)
What will be the final value of M if the parameters are passed by reference? What will it be if they are passed by value-result?

When the parameters of are passed by reference, the values of X and Y will both be 1 because of the 'X = 1' assignment statement. It will change the value of X to 1, therefore changing N to 1, and therefore Y = 1. So the Z value (equivalent to the final M value) will be X + Y = 1 + 1 + 2.

When the parameters are passed by value-result, the value of x will be 1 after the assignment statement, but the value of N and Y will remain unchanged, so M = X + Y = 1 + 2 = 3

Exercise 2-16: There are several different varieties of pass by value-result: the address of the actual can be computed once, at subprogram entry time, or twice, once on entry and once on exit. Describe the output of this program under each of these two varieties of value-result:
DIMENSION A(2)
I = 1
A(1) = 10
A(2) = 11
Call SUB (I, A(I))
PRINT, A(1), A(2),
END
SUBROUTINE SUB (K, X)
PRINT, X
K = 2
X = 20
RETURN
END
Does the outcome depend on the order which the results are copied from the formulas back into the actuals?

When the address of the actual is computed at subprogram entry time:
Values before SUB: A(1) = 10, A(2) = 11, I = 1, K = 1, X = 10
After "K = 2" and "X = 20" statements in SUB: A(1) = 10, A(2) = 11, I = 1, K = 2, X = 20
RETURN of SUB: A(1) = 10, A(2) = 11, I = 1, K = 2, X = 20
Output: 10, 11

When the address is computed on entry and on exit time:
Values before SUB: A(1) = 10, A(2) = 11, I = 1, K = 1, X = 10

After "K = 2" and "X = 20" statements in SUB: A(1) = 10, A(2) = 11, I = 1, K = 2, X = 20
RETURN of SUB: A(1) = 10, A(2) = 20, I = 1, K = 2, X = 20
Output: 10, 20

So yes the outcome does depend on the order which the results are copied from the formulas back into the actuals.