

Math 248 Computers and Numerical Algorithms–Pruett

LABORATORY ASSIGNMENT Real, Integer, and Mixed-Mode Expressions

- B Let I, J, and K be integer variables with values of 1, 2, and 4, respectively, and let A, B, and C be real variables with values of 1.0, 2.0, and 4.0, respectively. Write a short program that initializes each of these variables *at compile time* and prints out each of their values. Compile and run your program.
- B *By hand* complete the first two columns of the following Table by working from TOP DOWN. Consider the expression in the first column. If the expression is purely integer, write INT in the second column. If the expression is purely real, write REAL in the second column. If the expression is of mixed mode, write MM in the second column. Now play computer. Evaluate the expression *by hand* as you think Fortran 90 would evaluate it, and enter its anticipated value in the third column. Be as explicit as possible. That is, if the result is real, make sure you include the decimal point.
- B Now modify the program in Part 1 to complete the last two columns of the Table. Again work TOP DOWN, one row at a time. Add a Fortran 90 WRITE statement to output the value of the first expression in the Table *without assigning the value to a variable*. Compile and run. Place your *exact* Fortran result in the third column. In the last column, place "Y" if you evaluated the expression correctly by hand and "N" if you evaluated it incorrectly. Repeat for each of the remaining six expressions.
- A Repeat the evaluations above, this time by using an *assignment statement* with a *real* variable on the left-hand side prior to writing out the result. (Add two columns to the table for the anticipated and actual results.)

You will not be graded on the basis of how many results you got correct. You will be graded on whether or not you followed directions.

Expression	Type	By Hand	By Fortran	Correct?
$(A + B)/C$				
$(I + J)/K$				
$(I + J)/C$				
$C**(A/B)$				
$C**(I/J)$				
$A/B + REAL(J)/K$				
$I/J*K + A/B*C$				

*****MORAL***: Whenever possible, avoid mixed-mode expressions!!!**