This program carries out the pivot operation using “fraction form” arithmetic at the pivot element in column C and row R of the table of numbers stored in matrix [A]. Since the pivot operation for the “simplex method” chooses the pivot column and then the pivot row, this program asks for C and then R.

**Program Operation**

1. Enter your simplex tableau in matrix [A] using **MATRIX EDIT 1** and then leave the matrix editor by **2nd QUIT**.

2. Select the program PIVOT by pressing **PRGM** and either pressing the number shown next to this program or by using the up/down arrows to highlight the number shown next to this program and pressing **ENTER**.

3. The TI-83 screen will display prgmPIVOT. Press **ENTER** to start the program.

4. Press **ENTER** to begin the program (the other choices give further information about this program or allow you to quit). The current values in the matrix [A] will be displayed and if you don’t see all of it, you can scroll to other parts using the arrow keys. Press **ENTER** when you are ready to select the pivot column and the pivot row.

5. The prompt **P C?** stands for “Pivot Column? ” Enter the number of the pivot column and press **ENTER**.

   The prompt **P R?** stands for “Pivot Row? ” Enter the number of the pivot row and press **ENTER**.

If you should enter a column or row number too small or too large, the program will respond with BAD, while if your pivot column and row select a zero for the pivot element, the program will respond with NOT ON ZERO. Press **ENTER** to run the program again.

If you press a button that causes an error message of the form **ERR:SYNTAX** — or any other statement after the letters **ERR:** — press **1** to QUIT and then press **ENTER** to run the program again.

6. The program will carry out the pivot operation and display the new matrix [A].
You can scroll to other parts of it using the arrow keys. Press ENTER when you are finished.

(7) If you are ready to pivot at another pivot element, press ENTER to run the program again using the new numbers in your matrix [A]. When you are finished, press 4 to QUIT and the program will conclude with the statement Done.

**Example**

To solve the linear programming problem

\[
\text{maximize } P = 5x_1 + 7x_2 \\
\text{subject to } \begin{cases} 
   x_1 + 2x_2 \leq 8 \\
   x_1 + x_2 \leq 5 \\
   x_1 \geq 0 \text{ and } x_2 \geq 0
\end{cases}
\]

we proceed as follows.

This final tableau shows that the maximum is 31 when \( x_1 = 2, x_2 = 3 \).