

SUMMARY OF SECTION 2.1

A PERMUTATION OF THE SET OF INTEGERS $\{1, 2, \dots, N\}$ IS AN ARRANGEMENT OF THESE INTEGERS IN SOME ORDER WITHOUT OMISSIONS OR REPETITIONS.

AN INVERSION IS SAID TO OCCUR IN A PERMUTATION $(j_1, j_2, \dots, j_N)$ WHENEVER A LARGER INTEGER PRECEDES A SMALLER ONE. TO FIND ALL INVERSIONS, FIND ALL NUMBERS LESS THAN j_1 THAT FOLLOW j_1 IN THE PERMUTATION, THEN FIND ALL NUMBERS LESS THAN j_2 THAT FOLLOW j_2 IN THE PERMUTATION. CONTINUE THIS PROCESS FOR $j_3, j_4, \dots, j_{N-1}$.

A PERMUTATION IS CALLED EVEN IF THE TOTAL NUMBER OF INVERSIONS IS AN EVEN INTEGER AND IS CALLED ODD IF THE TOTAL NUMBER OF INVERSIONS IS odd.

AN ELEMENTARY PRODUCT FROM AN $N \times N$ MATRIX IS ANY PRODUCT OF N ENTRIES FROM THE MATRIX, NO TWO OF WHICH COME FROM THE SAME ROW OR SAME COLUMN.

A SIGNED ELEMENTARY PRODUCT FROM A IS AN ELEMENTARY PRODUCT $a_{1j_1} a_{2j_2} a_{3j_3} \dots a_{Nj_N}$ FROM A WHICH IS MULTIPLIED BY $+1$ IF $(j_1, j_2, \dots, j_N)$ IS EVEN AND -1 IF $(j_1, j_2, \dots, j_N)$ IS odd.