Bonus Lab1 RN

October 13, 2024

Yes, the content of each bracket in the given formula of the determinant represents the determinant of the minor of the element with which the bracket is multiplied. Thus, we could rewrite the determinant formula as follows:

$$\begin{aligned}\det(A) = a_{11} \cdot \left[(-1)^{1+1} \cdot \det(M_{11})\right] + a_{12} \cdot \left[(-1)^{1+2} \cdot \det(M_{12})\right] \\ + a_{13} \cdot \left[(-1)^{1+3} \cdot \det(M_{13})\right]\end{aligned}$$

Each term of the form $(-1)^{i+j} \cdot \det(M_{ij})$ represents the cofactor of the element a_{ij}. We denote $(-1)^{i+j} \cdot \det(M_{ij})$ as C_{ij}. The determinant formula can be rewritten using cofactors:

$$\det(A) = a_{11} \cdot C_{11} + a_{12} \cdot C_{12} + a_{13} \cdot C_{13}$$

Thus, we have managed to express the determinant of the matrix in terms of its cofactor. This formula is called the Laplace expansion of the determinant. Here it was done for the elements of a row, but it can also be done for a column.