The second example is the transportation problem. In this problem there is a given amount of a product located at each of several points of origin. Specifically, there are eight sub-I units of the product located at origin point I. There is also a certain minimum requirement for the product at each of a number of destination points. That is to say, at least B sub-I units of the product must be shipped to the destination J. The given cost of shipping a unit of the product from origin I to destination J is C sub-I J. Lambdus of IJ is the number of units of the product to be shipped from I to J. The shipper wishes to find values of the lambdas that will minimize his total shipping cost. Again, the constraints are obvious. Negative shipments can't be made, nor can more be shipped from an origin point than are located at that origin point. And minimum destination requirements for the product must be met. These three conditions are shown by the first three relationships given.

The third example is the personnel assignment problem. In this problem a group of people have been rated according to their abilities and put into various personnel categories. Little A sub-I is the number of people assigned to personnel category I. People from this group are assigned to openings existing in each of a number of job categories. B sub-J here is the number of job openings to be filled in job category A. C sub-I J is the productivity of a worker in personnel category I who has a job in category J. And lambdus of IJ is the number of workers in category I to be assigned to job category J. The employer wishes to make assignments; that is, determine lambdas so that the total productivity is maximum.

The constraints are that a negative number of workers can't be assigned from a category. And all job openings must be filled. Furthermore, a greater number cannot be assigned than exist in a category.

The applications just cited are only three of a large number of useful applica-