Asymptotic enumeration of integer matrices

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Let $s = (s_1, s_2, \ldots, s_m)$ and $t = (t_1, t_2, \ldots, t_n)$ be vectors of non-negative integers. Let $M(m,s;n,t)$ be the number of $m \times n$ matrices over $\{0,1,2,\ldots\}$ with the ith row summing to s_i and the jth column summing to t_j. We are interested in determining the asymptotic value of $M(m,s;n,t)$ as $m,n \to \infty$ under suitable conditions on s and t. In this talk we survey the work that has been done in the area and explore some of the techniques used. In particular, we will present the calculation for estimating the number of $n \times n$ symmetric matrices over $\{0,1,2,\ldots\}$ with zeros on the main diagonal and each row and column summing to s, for sufficiently large n.