A central limit theorem for descents and major indices in fixed conjugacy classes of S_n

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Abstract

The distribution of descents in fixed conjugacy classes of S_n has been studied, and it is shown that its moments have interesting properties. Kim and Lee showed, by using Curtiss' theorem and moment generating functions, how to prove a central limit theorem for descents in arbitrary conjugacy classes of S_n. In this talk, we prove a modified version of Curtiss' theorem to shift the interval of convergence in a more convenient fashion and use this to show that the joint distribution of descents and major indices in conjugacy classes is asymptotically bivariate normal. (joint work with Sangchul Lee)