Can one count the shape of a drum?

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Nodal domains of real eigenfunctions display a rich variety of shapes and properties. Their understanding touches upon a diverse set of subjects such as percolation, spectral theory, and quantum chaos. After a short review, I shall focus on one aspect, namely on the connection between nodal counts and isospectrality. I shall show that the sequence of integers formed by counting the number of nodal domains of successive eigenfunctions, contains geometric information which is complementary to the geometrical information stored in the spectrum. This sequence distinguishes between isospectral domains and thus, if one cannot hear the geometrical information stored in the spectrum. This sequence distinguishes between isospectral domains and thus, if one cannot hear the shape of a drum, one can count it.