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Updown numbers and the initial monomials of the slope variety.

Let I_n be the ideal of all algebraic relations on the slopes of the $\binom{n}{2}$ lines formed by placing n points in a plane and connecting each pair of points with a line. Under each of two natural term orders, the initial ideal of I_n is generated by monomials corresponding to permutations satisfying a certain pattern-avoidance condition. We show bijectively that these permutations are enumerated by the updown (or Euler) numbers, thereby obtaining a formula for the number of generators of the initial ideal in every degree. (Received September 07, 2010)