Bounds on the Projective Dimension and Regularity of Ideals

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Let R = K[x_1....x_n] be a polynomial ring over a field and let I = (f_1....f_t) be a homogeneous ideal of R. There has been a lot of interest in finding bounds on the pd(R/I) or reg(R/I) in terms of data readily apparent before one computes a resolution. Hilbert's syzygy theorem is a classical example. More recently Stillman asked whether pd(R/I) could be bounded purely in terms of the degrees d_1...d_t of f_1...f_t. This and the corresponding question for reg(R/I) are open. I will discuss some approaches and recent progress on these and related questions.