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Extremal Graphs With Local Conditions.

We will discuss two natural questions in Extremal Graph Theory, which turn out to have similar answers, one conjectured and one proven. Both questions ask for the maximum or minimum number of combinatorial substructures in a graph with a certain condition that holds locally on every vertex. The first question asks for the maximum number of triangles in any n -vertex graph for which every vertex has degree at most t , and the second question asks for the minimum number of edges in any n -vertex graph for which every vertex is in a complete graph of order t . In both questions, when n satisfies particular divisibility properties with respect to t , then the answer is a disjoint union of complete graphs, but becomes more complicated for general values of n and t . (Received July 31, 2018)