The enumeration degrees measure the computability-theoretic difficulty of enumerating sets of natural numbers. In contrast to the Turing degrees, a set and its complement need not have comparable degree. The enumeration degrees of sets which are enumeration-above their complements form an embedded copy of the Turing degrees within the enumeration degrees called the total degrees. Dual to the total degrees, the cototal degrees are the degrees of sets which are enumeration below their complements. We will explore how the cototal degrees perfectly capture the computability-theoretic complexity of objects from various areas of mathematics. (Received February 04, 2019)