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The Size of the Largest Part of Random Weighted Partitions of Large Integers

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(Submitted on 24 Jul 2011)

For a given sequence of weights (non-negative numbers), we consider partitions of the positive integer n. Each n-partition is selected uniformly at random from the set of all such partitions. Under a classical scheme of assumptions on the weight sequence, which are due to Meinardus (1954), we show that the largest part in a random weighted partition, appropriately normalized, converges weakly, as n tends to infinity, to a random variable having the extreme value (Gumbel's) distribution. This limit theorem extends some known results on particular types of integer partitions and on the Bose-Einstein model of ideal gas.

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