

1106-VQ-2351 **Alexa Eryn Ortiz*** (alexa.e.ortiz@gmail.com), Austin, TX 78704. *Rank-Unimodality of b-ary Partitions*. Preliminary report.

This research project focuses on b -ary partitions, denoted $R_b(n)$, which are ways of writing an integer as a sum of powers of b . Previous research has shown that with a suitable partial ordering, the set of binary partitions, denoted $R_2(n)$, is rank-unimodal for $n < 30$, which means that the number of partitions at each level increases, and then decreases, as one moves through the partially ordered set, or poset. Using Maple 17 software, we examined values of n , up to $n = 27,000$, for which $R_2(n)$ is not rank-unimodal. There are only 33 such even n for $n < 27,000$, with values between 30 and 264. We examined the relative location of the rank with the greatest number of elements, which always occurs in the latter half of the poset, and increases for larger n . The next phase of this research is the examination of other properties of the 33 even integers for which $R_2(n)$ is not rank-unimodal, as well as that of those for which $R_2(n)$ is rank-unimodal. Upon examining ternary partitions, denoted $R_3(n)$, we found 369 values of n , up to $n = 30,000$, for which $R_3(n)$ is not rank-unimodal. These values range from $n = 132$ to $n = 3462$. Current research includes expansion of data for $n > 30,000$ for $R_2(n)$ and $R_3(n)$, and $R_b(n)$ for $b > 3$. (Received September 16, 2014)