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One of the most fundamental questions one can ask about a matroid is “what are the possible circuit sizes of the matroid”? Murty in 1971 characterized the connected binary matroids that have all circuits having the same size. These matroids include the duals of projective geometries for example. Here we give partial results toward characterizing the connected binary matroids that contain circuits of two different specified sizes. (Received September 06, 2007)