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We describe the construction of a database of the matroids on up to nine elements, along with a variety of matroidal properties, and an online interface to this database. This format permits the rapid searching of the database to extract either numerical data summaries (“*How many* matroids have property X , but not property Y ?”) or specific matroids (“*Which* matroids have property X , but not property Y ?”). We present examples of both types of query and discuss a number of open questions raised by such investigations. (Received February 04, 2008)