From observations of meteors, we are able to determine the orbit of the meteoroid. We then decide which meteor shower the observed meteor belongs to based on the orbital elements of this orbit. Several methods, collectively known as D-criteria, have been devised for this exact purpose. These are based on an orbital dissimilarity measure the value of which is then compared with some fixed cutoff value. We describe the D_{SH}, D_{D}, D_{H} and D_{N} criteria and discuss their properties. These findings are used to create a software tool which applies these criteria to real-world data.