Exploratory data analysis of UFO data set

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Summary of the data set

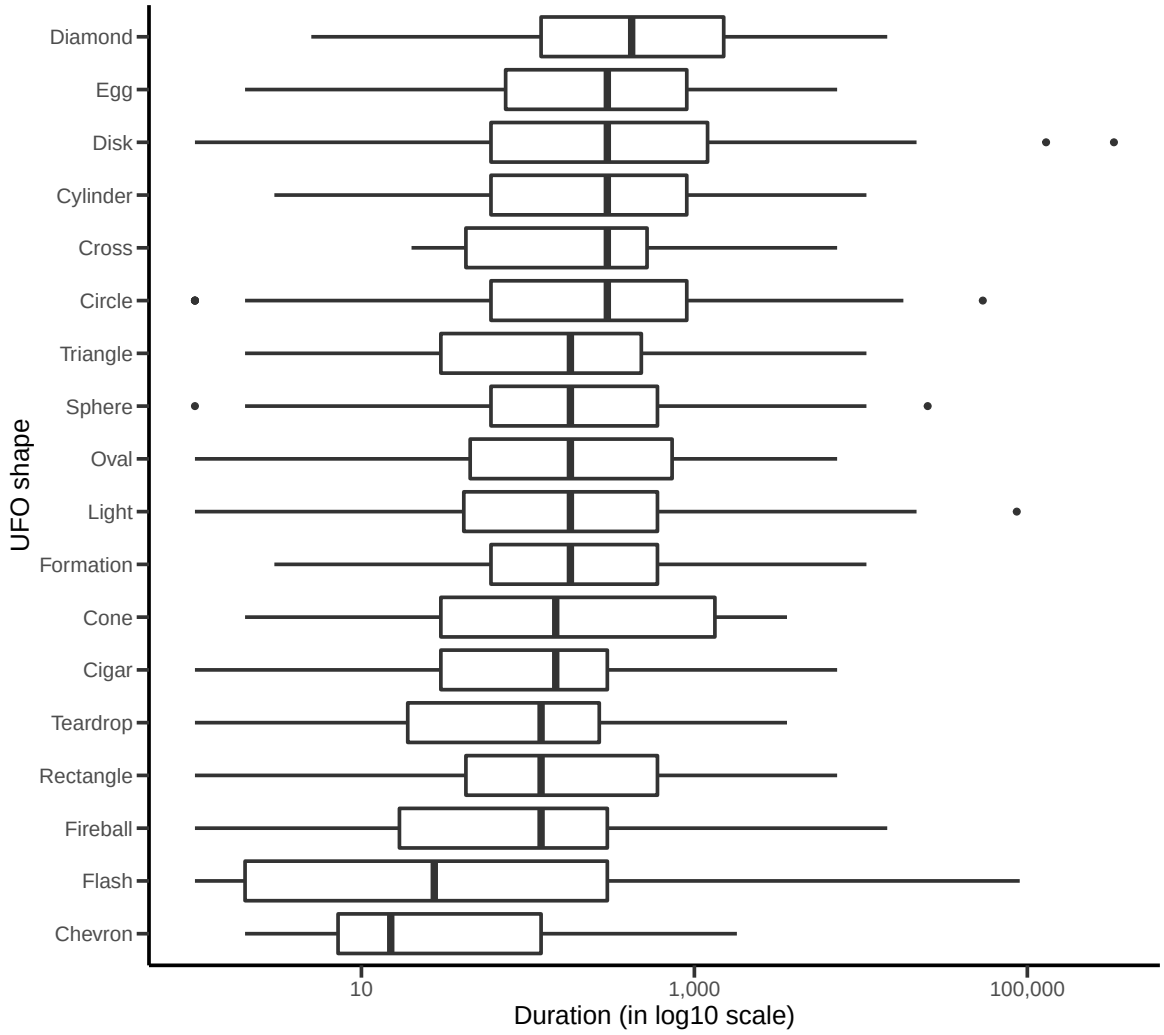
The data set used in this project are records of UFO sightings in British Columbia, Canada and Washington State, USA, which is provided by America's foremost UFO Reporting Agency since 1974. Each row in the data set represents an observation of UFO sighting, and features recorded include place and time, shape of UFO, duration of sightings, and a short descriptive summary. There are 4710 observations and 7 features in the data set. However, there are many records with invalid shape or durations. After removing invalid records, there are 2682 observations left. This project will only consider UFO shapes that have more than 30 observations. Table 1 summarizes the duration for each UFO shape.

Table 1: Summary on the duration (seconds) of sightings for each shape

Shape	Numer of observations	Median	Minimum	Maximum
Chevron	34	15.0	2	1800
Flash	68	27.5	1	90000
Fireball	250	120.0	1	14400
Rectangle	43	120.0	1	7200
Teardrop	19	120.0	1	3600
Cigar	56	150.0	1	7200
Cone	16	150.0	2	3600
Formation	113	180.0	3	10800
Light	798	180.0	1	86400
Oval	155	180.0	1	7200
Sphere	233	180.0	1	25200
Triangle	252	180.0	2	10800
Circle	370	300.0	1	54000
Cross	11	300.0	20	7200
Cylinder	48	300.0	3	10800
Disk	138	300.0	1	331200
Egg	27	300.0	2	7200
Diamond	51	420.0	5	14400

Exploratory analysis on the data set

The median duration of sighting has been selected as the preferred measure of central tendency for this project because the distributions of durations are skewed. Figure 1 illustrates the distribution of durations for each shape through jitter plots of each different. A log_{10} scale was used for duration axis so that the distribution of observations could be seen more clearly.



From Table 1 and Figure 1, it is noted that several shapes share median durations. For example, both 'Fireball' and 'Rectangle' have median durations of 120 seconds or 2 minutes. Multiple shapes also shared median durations of 3 minutes and 5 minutes. Based on a review of the raw data, it appears that many observers reported durations to the nearest minute which explains these duplications and the 'binning' of points around particular values observed in Figure 1.