1 Trace Lifetime Analysis

To be able to predict the remaining time until a failure, it is helpful to know how the lifetime of the traces is distributed. In this section we will attempt to fit the lifetime of the traces to a distribution.

1.1 Normality

The first guess for a fitting distribution would be a normal distribution. However, the Shapiro-Wilk normality test rejected the hypothesis that the lifetimes are normally distributed with a p-value of 1.26×10^{-5}. Hence, we can safely conclude that the data do not follow a normal distribution. This is also visible on the following quantile-quantile plot.

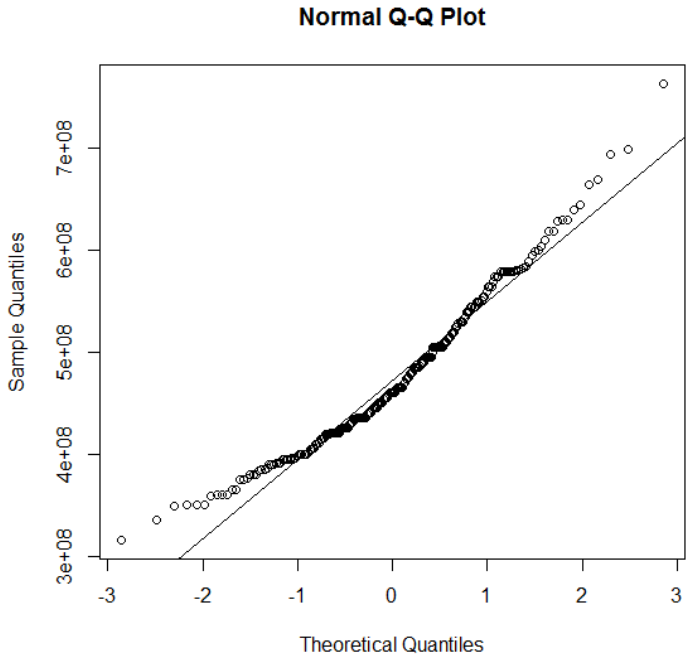

Figure 1: Quantile-quantile plot of the trace lifetimes.

1.2 Cullen and Frey graph

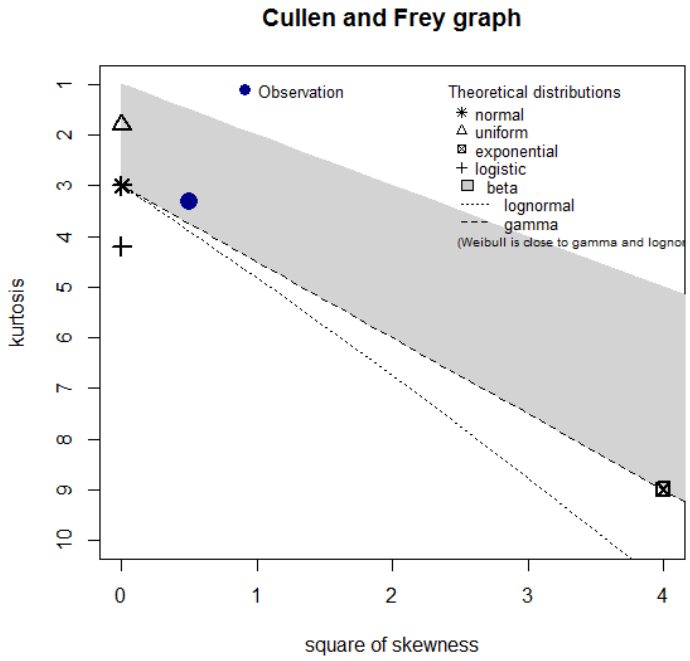

Figure 2: Cullen and Fray graph of the data.

Above, a Cullen and Fray graph is plotted. The data is placed based on its kurtosis and skewness. A few well-known distributions are also plotted on this plane. This plot would suggest a beta distribution. However, the beta distribution has a support of $[0, 1]$ and the lifetime of a cycle is not bounded. Other distributions that have similar kurtosis and skewness are the Weibull distribution and the gamma distribution.

References