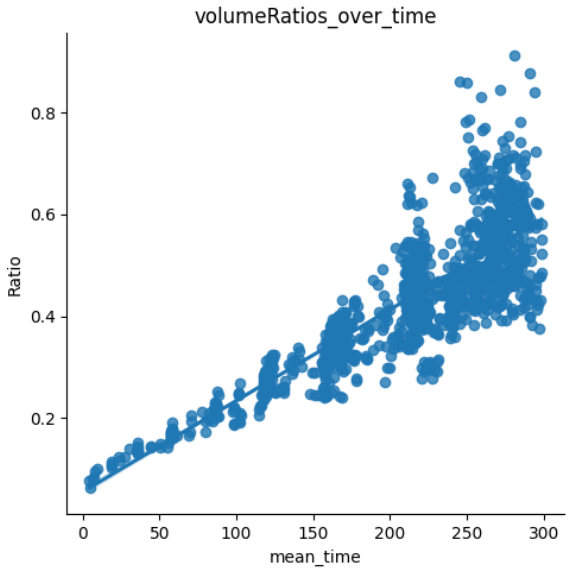
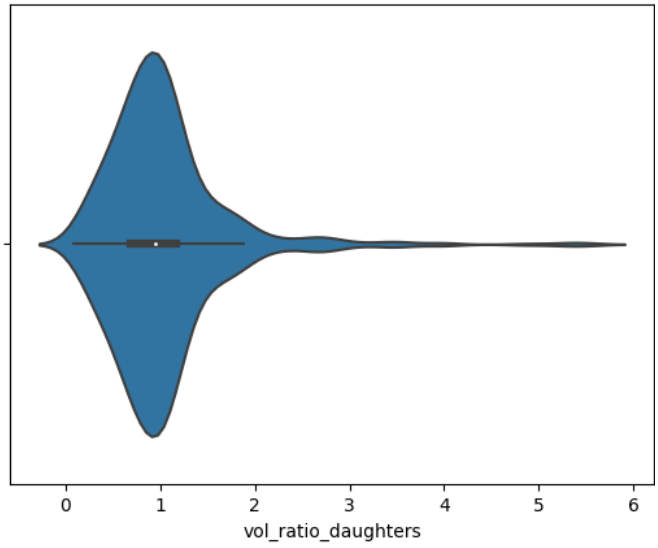
Question1

WHAT IS THE TREND YOU SEE? WHAT EXPLAINS THIS TREND?

The trend shown in this graph: as embryos develop, the surface area to volume ratio of the cell becomes larger.
Explanation of this trend: as embryo develops, cell surface increases more quickly than its volume, which allows more efficient exchange of nutrients and waste with surrounding environment, as well as the communication among cells.



X axis: For the embryo, it represents embryo development time observed; For each cell, it means the average time point cell exits in the process of embryo development.
Y axis: the ratio of the average surface area and Volume for each cell.



Violin plot; the white plot represents the median; the thick black bar in the centre represents the interquartile range. on each side of the black lines is the kernel density estimation to show the distribution shape of the data. Wider sections of violin plot represent a higher probability that member son population will take on the given value; the skinnier sections represent a lower probability.

Question2

PLOTTING OUT THE VOLUME RATIOS, YOU SHOULD SEE SOMETHING SIMILAR TO FIGURE 3. WHAT DO YOU THINK CAUSES THE SKEW IN DISTRIBUTION ?

X axis represents the volume ratio of two daughter cells derived from the same cell. As shown in the picture, the volume ratio of two daughter cells lies around 1. The skew is caused by the distinct difference in volumes between two daughter cells. Such asymmetric cell division may reflect the cellular response to signals, polarisation, and differentiation.