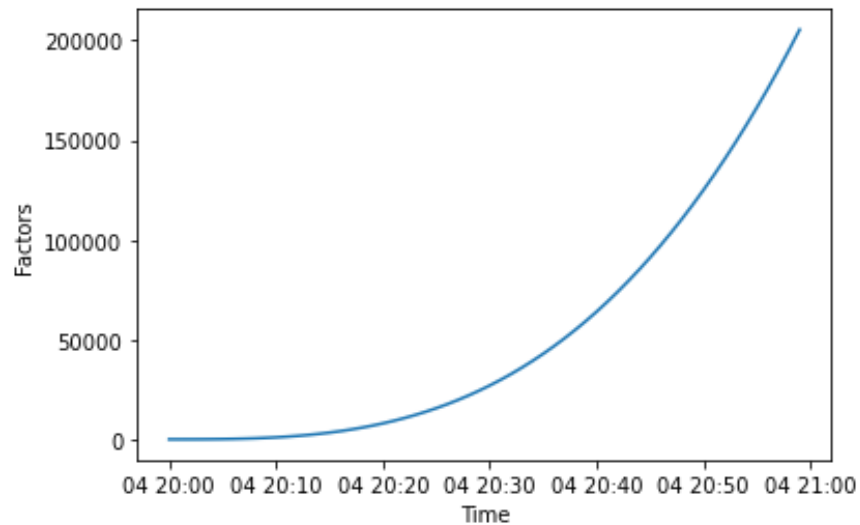Code-based data analysis

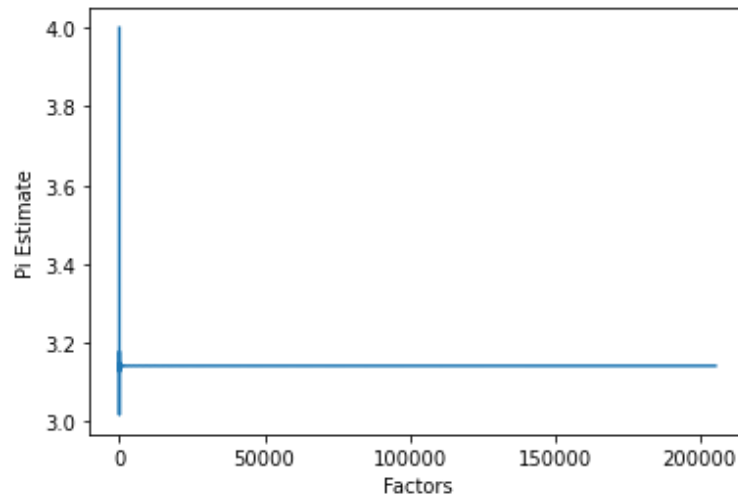**Figure 1: Relationship between factors and time**



These graphs were created using the matplotlib python library. This figure shows the relationship between factors and time. Factors, here, represent perfect cubes, or the triple product of the same number (2 * 2 * 2 = 8). As time increases, the factors increase at an increasing rate. This change occurs in the shape of the function $y = x^3$.

**Figure 2: Relationship between pi estimate and time**
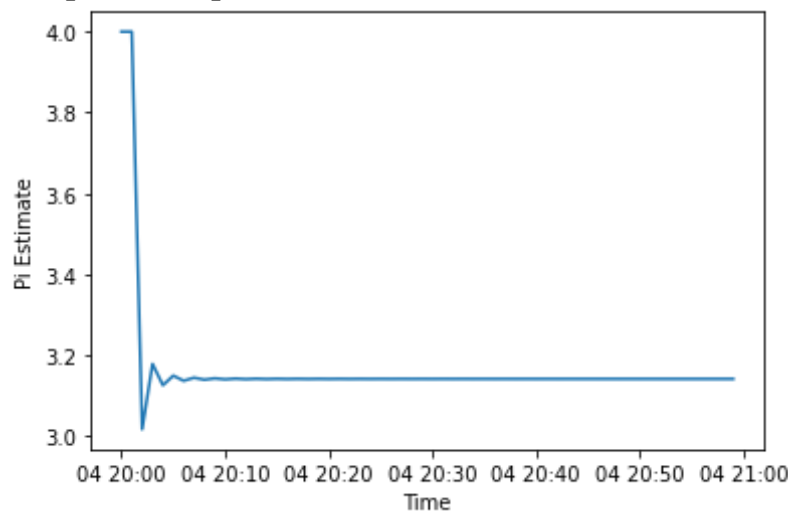


This graph shows the relationship between the estimated value of pi and time. Pi is a constant, so the real value of pi does not change over time, rather the value represented by the API changes over time. Initially, the API shows a value of 4 for pi. Then, the value approaches the true value of pi over time. This may occur because the website is performing some approximation of pi beginning at minute 00:00:00 and getting more advanced toward the end of the hour.

**Figure 3: Relationship between pi estimate and factors**



This graph represents the relationship between the estimated value of pi and factors. Like the relationship between estimates of pi and time, the graph shows that as the number of factors increases, the approximation of pi becomes more accurate. This may be due to the use of large cube numbers in the calculation of pi, or this may be a coincidence. The website may simply begin counting cubes at 1 and estimating pi from 4 at the start of the hour and the value of each variable, pi, and factor may not have an impact on each other.