In [ ]:

```
import sqlite3
import pandas as pd
import matplotlib.pyplot as plt
from sqlalchemy import create_engine
```

In [ ]:

```
con = create_engine('sqlite:///pi.db').connect()
frame = pd.read_sql_table('pidata', con)
```

In [ ]:

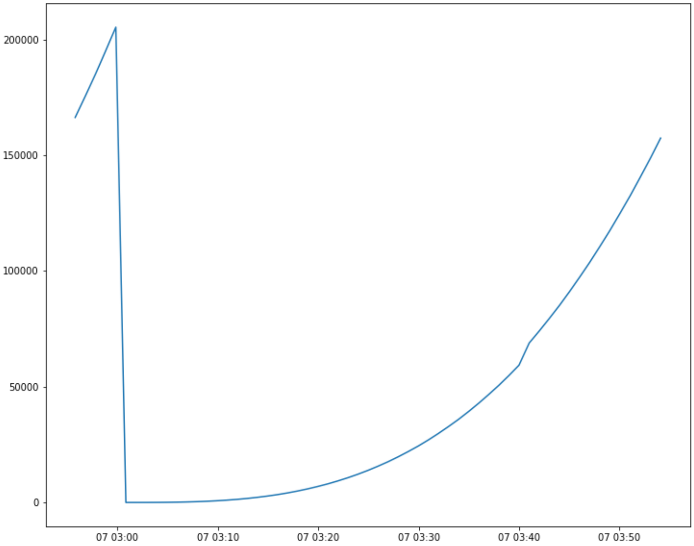
```
print(frame)
frame["time"] = frame["time"].astype("datetime64")
frame= frame.set_index("time")
```

```
    index  factor        pi                time
0       0  166375  3.141599  2022-05-07 02:55:47
1       0  175616  3.141587  2022-05-07 02:56:48
2       0  185193  3.141598  2022-05-07 02:57:49
3       0  195112  3.141588  2022-05-07 02:58:49
4       0  205379  3.141598  2022-05-07 02:59:50
5       0       1  4.000000  2022-05-07 03:00:50
6       0       1  4.000000  2022-05-07 03:01:51
7       0       8  3.017072  2022-05-07 03:02:51
8       0      27  3.178617  2022-05-07 03:03:51
9       0      64  3.125969  2022-05-07 03:04:51
10      0     125  3.149593  2022-05-07 03:05:51
11      0     216  3.136963  2022-05-07 03:06:52
12      0     343  3.144508  2022-05-07 03:07:52
13      0     512  3.139640  2022-05-07 03:08:52
14      0     729  3.142964  2022-05-07 03:09:52
15      0    1000  3.140593  2022-05-07 03:10:52
16      0    1331  3.142344  2022-05-07 03:11:53
17      0    1728  3.141014  2022-05-07 03:12:53
18      0    2197  3.142048  2022-05-07 03:13:53
19      0    2744  3.141228  2022-05-07 03:14:53
20      0    3375  3.141889  2022-05-07 03:15:54
21      0    4096  3.141349  2022-05-07 03:16:54
22      0    4913  3.141796  2022-05-07 03:17:54
23      0    5832  3.141421  2022-05-07 03:18:54
24      0    6859  3.141738  2022-05-07 03:19:54
25      0    8000  3.141468  2022-05-07 03:20:55
26      0    9261  3.141701  2022-05-07 03:21:55
27      0   10648  3.141499  2022-05-07 03:22:55
28      0   12167  3.141675  2022-05-07 03:23:55
29      0   13824  3.141520  2022-05-07 03:24:55
30      0   15625  3.141657  2022-05-07 03:25:55
31      0   17576  3.141536  2022-05-07 03:26:56
32      0   19683  3.141643  2022-05-07 03:27:56
33      0   21952  3.141547  2022-05-07 03:28:56
34      0   24389  3.141634  2022-05-07 03:29:57
35      0   27000  3.141556  2022-05-07 03:30:57
36      0   29791  3.141626  2022-05-07 03:31:57
37      0   32768  3.141562  2022-05-07 03:32:57
38      0   35937  3.141620  2022-05-07 03:33:58
39      0   39304  3.141567  2022-05-07 03:34:58
40      0   42875  3.141616  2022-05-07 03:35:58
41      0   46656  3.141571  2022-05-07 03:36:58
42      0   50653  3.141612  2022-05-07 03:37:59
43      0   54872  3.141574  2022-05-07 03:38:59
44      0   59319  3.141610  2022-05-07 03:39:59
45      0   68921  3.141607  2022-05-07 03:41:00
46      0   74088  3.141579  2022-05-07 03:42:00
47      0   79507  3.141605  2022-05-07 03:43:00
48      0   85184  3.141581  2022-05-07 03:44:01
49      0   91125  3.141604  2022-05-07 03:45:01
50      0   97336  3.141582  2022-05-07 03:46:01
51      0  103823  3.141602  2022-05-07 03:47:02
52      0  110592  3.141584  2022-05-07 03:48:02
53      0  117649  3.141601  2022-05-07 03:49:03
54      0  125000  3.141585  2022-05-07 03:50:03
55      0  132651  3.141600  2022-05-07 03:51:04
56      0  140608  3.141586  2022-05-07 03:52:04
57      0  148877  3.141599  2022-05-07 03:53:05
58      0  157464  3.141586  2022-05-07 03:54:05
```

In [ ]:

```
plt.figure(figsize=(12, 10))
plt.plot(frame["factor"])
plt.locator_params(axis='x', nbins=10)
```

```
/tmp/ipykernel_138653/2894234518.py:3: UserWarning: 'set_params()' not defined for locator of type <class '
matplotlib.dates.AutoDateLocator'>
  plt.locator_params(axis='x', nbins=10)
```

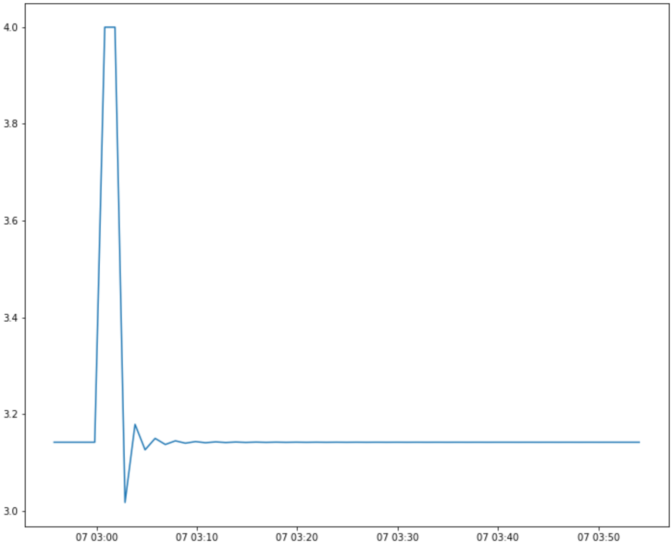


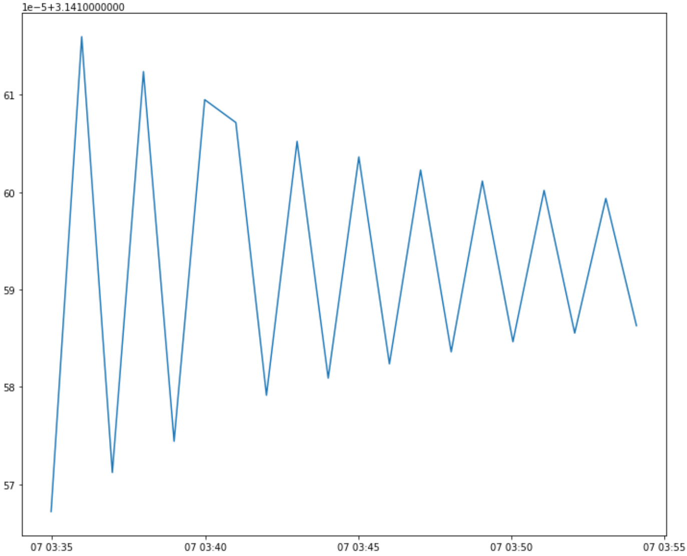
Pi plots (Full, and Zoomed in on the last 20)

In [ ]:

```
plt.figure(figsize=(12, 10))
plt.plot(frame["pi"])
plt.locator_params(axis='x', nbins=10)
framelast20 = frame[39:59]
plt.figure(figsize=(12, 10))
plt.plot(framelast20["pi"])
plt.locator_params(axis='x', nbins=10)
```

```
/tmp/ipykernel_138653/3859582096.py:3: UserWarning: 'set_params()' not defined for locator of type <class '
matplotlib.dates.AutoDateLocator'>
  plt.locator_params(axis='x', nbins=10)
/tmp/ipykernel_138653/3859582096.py:7: UserWarning: 'set_params()' not defined for locator of type <class '
matplotlib.dates.AutoDateLocator'>
  plt.locator_params(axis='x', nbins=10)
```





Analysis

The factor is clearly a function of minutes since the current hour started to the power of 3. (minute^3)

The pi number appears to be some of convering function for calculating pi starting at 4. Most likely the Lebniz fucntion, and presumably, the number of interations is equal to the factor, because it exactly equals the Lebniz fucntion for the first few function to pi pairings.

See this wikipedia graph for proof of that.