# Final Project - Breweries Opened By Year (UCSD DSE 200x)

February 23, 2019

## 1 United States Breweries Opened By Year

Final Project for UCSD DSE200x Python for Data Science Ryan Shaver

### 1.1 Abstract

Dataset: Alcohol and Tobacco, Tax and Trade Bureau from the U.S. Department of the Treasury Dataset of Opened Breweries from 1984 - December 31, 2018

Question: Has there been a national trend in brewery openings since 1984? If so, what is it?

Method Used: Line graph, representing breweries opened against years using Plot.ly tracers

Findings: There has been a positive trend in brewery opening, with notable increases nation wide around 1995 and 2010.

#### 1.1.1 The Data Set

The data set utilized for this project was aquired through Data.gov. Clicking through the link, you will see a data set which accounts for the breweries opened from 1984 to March 31, 2018. But by doing a bit more digging, I was able to locate a more up to date data set from the Alcohol and Tobaco, Tax and Trade Bureau from the U.S. Department of the Treasury

For those interested in exploring the data set themselves, the link is supplied on the TTB website. They provide an Excel format which was not readily formatted for analysis. In the project's Github repository, I will provide the file of my cleaned and transposed CSV.

```
In [8]: # Import
        import pandas as pd
        import numpy as np
        import plotly.plotly as py
        import plotly.graph_objs as go
```

```
In [9]: # Read in and display the DataFrame
        df = pd.read_csv("brewery_count_transposed.csv", header=0)
        df
```

Out[9]:

| | Year | AK | AL | AR | AZ | CA | CO | CT | DC | DE | FL | GA | HI | IA | ID | \ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1984 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 1 | 1985 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 2 | 1986 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 1987 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 4 | 1988 | 0 | 0 | 0 | 0 | 39 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 3 |
| 5 | 1989 | 0 | 0 | 0 | 6 | 50 | 7 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 3 |
| 6 | 1990 | 0 | 0 | 0 | 8 | 67 | 11 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 3 |
| 7 | 1991 | 3 | 0 | 0 | 8 | 76 | 22 | 0 | 0 | 0 | 13 | 0 | 0 | 4 | 5 |
| 8 | 1992 | 4 | 0 | 0 | 7 | 93 | 27 | 0 | 0 | 0 | 17 | 0 | 0 | 5 | 8 |
| 9 | 1993 | 3 | 0 | 0 | 7 | 115 | 38 | 0 | 0 | 0 | 22 | 0 | 0 | 6 | 10 |
| 10 | 1994 | 3 | 0 | 3 | 11 | 127 | 51 | 0 | 0 | 0 | 27 | 3 | 0 | 6 | 11 |
| 11 | 1995 | 5 | 5 | 3 | 11 | 167 | 74 | 0 | 0 | 4 | 36 | 6 | 4 | 6 | 15 |
| 12 | 1996 | 11 | 8 | 3 | 17 | 218 | 92 | 12 | 3 | 5 | 62 | 18 | 6 | 9 | 24 |
| 13 | 1997 | 16 | 8 | 4 | 34 | 259 | 112 | 22 | 5 | 6 | 86 | 24 | 8 | 12 | 28 |
| 14 | 1998 | 14 | 9 | 5 | 40 | 273 | 105 | 25 | 5 | 8 | 96 | 26 | 13 | 13 | 29 |
| 15 | 1999 | 19 | 9 | 4 | 48 | 289 | 102 | 26 | 4 | 9 | 97 | 30 | 16 | 14 | 25 |
| 16 | 2000 | 17 | 7 | 5 | 45 | 281 | 102 | 27 | 4 | 8 | 92 | 29 | 15 | 13 | 24 |
| 17 | 2001 | 17 | 4 | 5 | 45 | 266 | 102 | 22 | 5 | 8 | 84 | 30 | 14 | 16 | 20 |
| 18 | 2002 | 19 | 3 | 4 | 39 | 270 | 102 | 17 | 5 | 8 | 83 | 25 | 13 | 15 | 19 |
| 19 | 2003 | 15 | 3 | 4 | 36 | 278 | 99 | 17 | 4 | 9 | 78 | 29 | 13 | 17 | 20 |
| 20 | 2004 | 13 | 5 | 4 | 31 | 282 | 99 | 20 | 5 | 9 | 74 | 29 | 13 | 21 | 19 |
| 21 | 2005 | 15 | 5 | 4 | 31 | 278 | 104 | 19 | 4 | 8 | 69 | 25 | 12 | 18 | 20 |
| 22 | 2006 | 14 | 4 | 4 | 33 | 293 | 102 | 18 | 4 | 9 | 51 | 22 | 12 | 19 | 20 |
| 23 | 2007 | 15 | 5 | 4 | 33 | 310 | 112 | 19 | 3 | 10 | 50 | 23 | 12 | 20 | 20 |
| 24 | 2008 | 16 | 5 | 4 | 33 | 333 | 117 | 21 | 3 | 9 | 61 | 20 | 11 | 21 | 24 |
| 25 | 2009 | 18 | 5 | 5 | 34 | 340 | 116 | 19 | 3 | 11 | 52 | 22 | 11 | 28 | 25 |
| 26 | 2010 | 20 | 7 | 5 | 37 | 358 | 129 | 21 | 4 | 11 | 60 | 26 | 11 | 27 | 25 |
| 27 | 2011 | 23 | 9 | 7 | 45 | 401 | 149 | 20 | 6 | 12 | 71 | 25 | 12 | 35 | 33 |
| 28 | 2012 | 25 | 15 | 13 | 55 | 472 | 185 | 24 | 5 | 13 | 89 | 31 | 15 | 46 | 39 |
| 29 | 2013 | 25 | 23 | 18 | 59 | 528 | 234 | 39 | 11 | 13 | 113 | 37 | 17 | 54 | 42 |
| 30 | 2014 | 28 | 25 | 23 | 77 | 654 | 300 | 50 | 12 | 15 | 158 | 48 | 20 | 60 | 51 |
| 31 | 2015 | 35 | 30 | 29 | 91 | 788 | 352 | 59 | 13 | 21 | 205 | 54 | 26 | 71 | 57 |
| 32 | 2016 | 36 | 37 | 34 | 110 | 927 | 386 | 76 | 13 | 25 | 264 | 69 | 23 | 94 | 67 |
| 33 | 2017 | 45 | 52 | 44 | 130 | 1,106 | 448 | 103 | 13 | 33 | 338 | 102 | 28 | 115 | 76 |
| 34 | 2018 | 51 | 55 | 53 | 146 | 1,236 | 500 | 124 | 13 | 38 | 386 | 121 | 38 | 125 | 87 |

| | IL | IN | KS | KY | LA | MA | MD | ME | MI | MN | MO | MS | MT | NC | ND | NE | \ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4 | 4 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 5 | 5 | 4 | 0 | 0 | 0 | 5 | 3 | 0 | 3 | 7 | 0 | 0 | 0 | 6 | 0 | 0 | |
| 6 | 6 | 4 | 0 | 0 | 0 | 5 | 3 | 0 | 3 | 7 | 0 | 0 | 3 | 8 | 0 | 0 | |
| 7 | 9 | 5 | 0 | 0 | 3 | 6 | 4 | 3 | 3 | 8 | 3 | 0 | 5 | 11 | 0 | 0 | |
| 8 | 12 | 6 | 0 | 0 | 3 | 9 | 5 | 5 | 4 | 8 | 4 | 0 | 7 | 12 | 0 | 5 | |
| 9 | 16 | 7 | 5 | 3 | 4 | 9 | 7 | 8 | 6 | 9 | 5 | 0 | 10 | 14 | 0 | 6 | |
| 10 | 22 | 9 | 7 | 3 | 3 | 17 | 10 | 12 | 12 | 13 | 12 | 0 | 12 | 20 | 0 | 6 | |
| 11 | 26 | 10 | 13 | 7 | 4 | 27 | 12 | 21 | 24 | 18 | 13 | 0 | 13 | 25 | 3 | 8 | |
| 12 | 35 | 21 | 14 | 11 | 8 | 42 | 22 | 27 | 36 | 26 | 14 | 0 | 16 | 36 | 3 | 8 | |
| 13 | 39 | 26 | 17 | 14 | 11 | 44 | 27 | 28 | 60 | 37 | 22 | 0 | 20 | 40 | 4 | 9 | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | 44 | 25 | 17 | 15 | 14 | 48 | 27 | 33 | 71 | 35 | 26 | 0 | 24 | 50 | 6 | 8 |
| 15 | 47 | 24 | 15 | 12 | 11 | 50 | 30 | 37 | 79 | 36 | 30 | 3 | 24 | 52 | 3 | 9 |
| 16 | 45 | 26 | 10 | 15 | 12 | 45 | 25 | 42 | 77 | 41 | 32 | 4 | 25 | 51 | 3 | 9 |
| 17 | 41 | 23 | 8 | 10 | 9 | 46 | 26 | 39 | 71 | 37 | 26 | 4 | 26 | 38 | 3 | 11 |
| 18 | 43 | 23 | 8 | 10 | 7 | 43 | 26 | 38 | 69 | 37 | 28 | 4 | 28 | 38 | 3 | 10 |
| 19 | 43 | 23 | 7 | 10 | 6 | 44 | 27 | 37 | 76 | 31 | 28 | 3 | 24 | 41 | 3 | 12 |
| 20 | 45 | 23 | 10 | 10 | 9 | 46 | 29 | 43 | 78 | 30 | 28 | 3 | 22 | 43 | 4 | 12 |
| 21 | 43 | 27 | 11 | 10 | 10 | 38 | 25 | 43 | 84 | 31 | 33 | 3 | 21 | 45 | 4 | 16 |
| 22 | 45 | 25 | 17 | 10 | 10 | 40 | 26 | 43 | 91 | 35 | 34 | 0 | 22 | 46 | 3 | 16 |
| 23 | 52 | 30 | 18 | 12 | 10 | 43 | 24 | 43 | 94 | 34 | 38 | 0 | 26 | 45 | 3 | 17 |
| 24 | 51 | 30 | 17 | 12 | 10 | 45 | 24 | 43 | 96 | 36 | 38 | 0 | 31 | 50 | 3 | 16 |
| 25 | 60 | 39 | 17 | 15 | 11 | 44 | 26 | 42 | 104 | 39 | 47 | 0 | 31 | 52 | 3 | 17 |
| 26 | 62 | 43 | 17 | 14 | 12 | 48 | 24 | 44 | 111 | 42 | 51 | 3 | 31 | 61 | 3 | 16 |
| 27 | 68 | 59 | 21 | 21 | 12 | 52 | 26 | 49 | 131 | 56 | 55 | 0 | 35 | 71 | 3 | 18 |
| 28 | 95 | 72 | 21 | 25 | 12 | 65 | 40 | 53 | 160 | 70 | 60 | 4 | 41 | 94 | 7 | 20 |
| 29 | 123 | 95 | 25 | 25 | 15 | 82 | 43 | 60 | 195 | 75 | 63 | 7 | 49 | 125 | 8 | 25 |
| 30 | 164 | 116 | 27 | 38 | 17 | 98 | 55 | 71 | 256 | 113 | 77 | 10 | 62 | 155 | 10 | 35 |
| 31 | 210 | 151 | 37 | 48 | 25 | 124 | 73 | 84 | 316 | 142 | 90 | 14 | 74 | 207 | 11 | 39 |
| 32 | 244 | 163 | 47 | 60 | 34 | 146 | 88 | 102 | 379 | 165 | 116 | 14 | 79 | 260 | 15 | 47 |
| 33 | 291 | 213 | 53 | 73 | 43 | 189 | 116 | 131 | 452 | 214 | 145 | 16 | 98 | 330 | 22 | 53 |
| 34 | 338 | 234 | 64 | 86 | 47 | 230 | 141 | 165 | 510 | 239 | 168 | 19 | 108 | 387 | 26 | 60 |

| | NH | NJ | NM | NV | NY | OH | OK | OR | PA | RI | SC | SD | TN | TX | UT | VA | \ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | |
| 2 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | |
| 3 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 8 | 6 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | |
| 4 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | 13 | 6 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | |
| 5 | 0 | 0 | 0 | 0 | 6 | 5 | 0 | 15 | 8 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | |
| 6 | 0 | 0 | 0 | 0 | 8 | 6 | 0 | 21 | 11 | 0 | 0 | 0 | 0 | 8 | 0 | 4 | |
| 7 | 0 | 0 | 3 | 0 | 13 | 9 | 0 | 26 | 12 | 0 | 0 | 0 | 0 | 7 | 3 | 5 | |
| 8 | 3 | 0 | 5 | 0 | 16 | 12 | 0 | 30 | 12 | 0 | 0 | 0 | 3 | 8 | 4 | 7 | |
| 9 | 4 | 0 | 8 | 3 | 20 | 15 | 4 | 37 | 12 | 0 | 0 | 0 | 5 | 11 | 4 | 12 | |
| 10 | 9 | 5 | 10 | 3 | 27 | 20 | 6 | 48 | 15 | 3 | 0 | 0 | 9 | 27 | 8 | 9 | |
| 11 | 14 | 7 | 12 | 5 | 44 | 28 | 8 | 54 | 27 | 6 | 11 | 0 | 13 | 48 | 13 | 12 | |
| 12 | 18 | 20 | 20 | 10 | 70 | 40 | 9 | 73 | 42 | 5 | 19 | 5 | 15 | 63 | 15 | 17 | |
| 13 | 19 | 23 | 26 | 18 | 84 | 55 | 9 | 86 | 56 | 6 | 21 | 5 | 21 | 71 | 17 | 23 | |
| 14 | 19 | 27 | 27 | 20 | 88 | 68 | 10 | 88 | 63 | 5 | 23 | 5 | 25 | 65 | 17 | 27 | |
| 15 | 19 | 28 | 26 | 24 | 81 | 77 | 10 | 88 | 74 | 6 | 22 | 7 | 23 | 66 | 20 | 29 | |
| 16 | 19 | 24 | 26 | 22 | 78 | 87 | 9 | 82 | 73 | 8 | 19 | 7 | 23 | 59 | 20 | 31 | |
| 17 | 17 | 22 | 23 | 16 | 83 | 74 | 6 | 82 | 81 | 7 | 19 | 6 | 23 | 47 | 16 | 29 | |
| 18 | 17 | 20 | 23 | 17 | 84 | 64 | 6 | 81 | 76 | 7 | 19 | 7 | 22 | 42 | 17 | 30 | |
| 19 | 16 | 22 | 20 | 16 | 86 | 59 | 6 | 87 | 78 | 6 | 21 | 7 | 22 | 41 | 15 | 30 | |
| 20 | 16 | 21 | 22 | 17 | 80 | 55 | 7 | 92 | 86 | 6 | 21 | 6 | 24 | 40 | 16 | 31 | |
| 21 | 14 | 21 | 22 | 16 | 82 | 53 | 8 | 88 | 78 | 5 | 19 | 6 | 19 | 45 | 15 | 34 | |
| 22 | 14 | 21 | 23 | 16 | 82 | 57 | 7 | 95 | 81 | 5 | 16 | 7 | 19 | 47 | 17 | 35 | |
| 23 | 15 | 21 | 21 | 16 | 77 | 58 | 6 | 96 | 94 | 5 | 17 | 8 | 22 | 45 | 15 | 35 | |
| 24 | 16 | 20 | 20 | 17 | 81 | 66 | 9 | 108 | 97 | 5 | 16 | 7 | 23 | 47 | 15 | 43 | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 17 | 22 | 21 | 18 | 84 | 66 | 10 | 108 | 96 | 5 | 15 | 7 | 23 | 47 | 18 | 42 |
| 26 | 19 | 24 | 26 | 20 | 100 | 75 | 10 | 120 | 118 | 5 | 16 | 8 | 26 | 59 | 18 | 44 |
| 27 | 21 | 31 | 30 | 20 | 123 | 81 | 10 | 148 | 146 | 6 | 17 | 9 | 31 | 84 | 18 | 54 |
| 28 | 25 | 29 | 38 | 23 | 150 | 99 | 13 | 180 | 162 | 9 | 23 | 12 | 45 | 107 | 22 | 67 |
| 29 | 35 | 37 | 48 | 26 | 193 | 114 | 17 | 220 | 183 | 12 | 30 | 12 | 51 | 128 | 24 | 85 |
| 30 | 46 | 49 | 60 | 34 | 255 | 151 | 18 | 244 | 233 | 14 | 37 | 15 | 69 | 170 | 27 | 117 |
| 31 | 63 | 71 | 71 | 39 | 329 | 187 | 21 | 281 | 278 | 15 | 51 | 19 | 88 | 220 | 29 | 155 |
| 32 | 73 | 96 | 86 | 44 | 394 | 236 | 26 | 304 | 333 | 17 | 59 | 21 | 101 | 266 | 34 | 209 |
| 33 | 88 | 123 | 110 | 46 | 471 | 324 | 43 | 347 | 411 | 27 | 84 | 28 | 120 | 333 | 39 | 287 |
| 34 | 106 | 146 | 124 | 50 | 532 | 377 | 55 | 386 | 472 | 33 | 94 | 35 | 140 | 387 | 46 | 328 |

| | VT | WA | WI | WV | WY |
|---|---|---|---|---|---|
| 0 | 0 | 4 | 5 | 0 | 0 |
| 1 | 0 | 4 | 6 | 0 | 0 |
| 2 | 0 | 4 | 7 | 0 | 0 |
| 3 | 0 | 4 | 10 | 0 | 0 |
| 4 | 0 | 7 | 12 | 0 | 0 |
| 5 | 3 | 8 | 14 | 0 | 0 |
| 6 | 4 | 10 | 17 | 0 | 0 |
| 7 | 6 | 13 | 18 | 0 | 0 |
| 8 | 6 | 15 | 19 | 0 | 0 |
| 9 | 7 | 21 | 23 | 0 | 0 |
| 10 | 10 | 28 | 29 | 3 | 0 |
| 11 | 12 | 48 | 35 | 0 | 8 |
| 12 | 20 | 79 | 50 | 4 | 10 |
| 13 | 24 | 109 | 57 | 4 | 14 |
| 14 | 27 | 115 | 65 | 5 | 15 |
| 15 | 24 | 118 | 77 | 5 | 13 |
| 16 | 23 | 113 | 91 | 6 | 13 |
| 17 | 19 | 94 | 82 | 4 | 11 |
| 18 | 25 | 94 | 90 | 5 | 11 |
| 19 | 25 | 91 | 90 | 5 | 11 |
| 20 | 26 | 93 | 97 | 4 | 13 |
| 21 | 24 | 100 | 98 | 4 | 14 |
| 22 | 24 | 108 | 103 | 6 | 14 |
| 23 | 22 | 110 | 105 | 6 | 14 |
| 24 | 24 | 121 | 110 | 6 | 14 |
| 25 | 27 | 138 | 108 | 8 | 13 |
| 26 | 32 | 157 | 119 | 8 | 16 |
| 27 | 34 | 188 | 126 | 8 | 15 |
| 28 | 39 | 230 | 146 | 8 | 19 |
| 29 | 45 | 266 | 146 | 9 | 25 |
| 30 | 51 | 314 | 168 | 13 | 28 |
| 31 | 66 | 383 | 189 | 17 | 32 |
| 32 | 73 | 424 | 217 | 24 | 33 |
| 33 | 84 | 499 | 261 | 27 | 39 |
| 34 | 90 | 540 | 303 | 32 | 44 |

In [10]:
```
# Construct Tracers for Plot.ly to Display
states = ['AK', 'AL','AR','AL','AZ','CA','CO','CT','DC','DE','FL','GA','HI','IA','ID'

def createTraces(states):
    traces = []
    for abbreviation in states:
        traces.append(go.Scatter(x=df['Year'], y=df[abbreviation], mode='lines', name=
    return traces


layout = go.Layout(title='Breweries Opened by Year',
                   plot_bgcolor='rgb(230, 230,230)',
                      xaxis=dict(
        title='Years',
        titlefont=dict(
            #family='Courier New, monospace',
            size=18,
            #color='#7f7f7f'
        )
    ),
    yaxis=dict(
        title='Breweries Opened',
        titlefont=dict(
            #family='Courier New, monospace',
            size=18,
            #color='#000000'
        )))


data = createTraces(states)
fig = go.Figure(data, layout=layout)

# Plot data in the notebook
py.iplot(fig, filename='simple-plot-from-csv')
```

Out[10]:
```
<plotly.tools.PlotlyDisplay object>
```

## 1.2 Conclusion

As can be observed from the above plot, there seemed to be a slight bump after 1995 and then a rather dramatic increase starting around 2009 to 2010. This information in itself is quite useful as it indicates a nation wide trend in brewery openings.

This information can lead economists and industry brewers to investigate what may have been the proximal causes for these two industry increases.

Further information I found worth noting are the states with the most breweries as of 2018. The usual suspects of California, Washington, and Colorado were among the top five, but I was surprised to see New York and Michigan in the top five as well. These top five were followed by Pennsylvania, Texas, North Carolina, Oregon, and Florida. Again where California, Colorado,

Oregon, and Texas are well known in the beer community as having outstanding breweries, it was enlightining to see Pennslvania, North Carolina, Florida, and Michigan in the mix.

For those planning brewery excurssions, this plot can certainly steer brewery goers in novel and unexcpected directions.

## 1.3 References

### 1.3.1 Plot.ly

- https://plot.ly/python/ipython-notebook-tutorial/
- https://plot.ly/python/choropleth-maps/
- https://www.youtube.com/watch?v=hA39KSTb3dY
- https://plot.ly/python/#animations
- https://plot.ly/python/gapminder-example/
- https://plot.ly/python/bubble-maps/

### 1.3.2 Folium / Leaflet

- https://www.youtube.com/watch?v=4RnU5qKTfYY -https://www.youtube.com/watch?v=xN2N-p33V1k

### 1.3.3 Widgets

- https://www.youtube.com/watch?v=1ndo6C1KWjI
- https://www.youtube.com/watch?v=i40d8-Hu4vM
- ipywidegs (core UI controls / sliders)
- bqplot (2d plotting)
- pythreejs, ipyvolume (3d plotting)
- ipyleaflet (maps)

### 1.3.4 CSV Analysis / ML

- https://www.youtube.com/watch?v=-0NwrcZOKhQ
- https://www.youtube.com/watch?v=Q73ADVZCqSU
- https://www.youtube.com/watch?v=OBPjFnyxoCc
- https://www.youtube.com/watch?v=zJ4RK6jtYCU&list=PLbD3QT5__Llz88nB-B-Kp5s118DOkAHr1

### 1.3.5 Resources

- https://plot.ly/python/choropleth-maps/
- https://www.kaggle.com/rdoume/beerreviews
- https://www.kaggle.com/ehallmar/beers-breweries-and-beer-reviews
- http://beer.tany.kim/
- https://untappd.com/api/docs
- https://www.reddit.com/r/Untappd/comments/41i45t/mass_data_export/
- https://www.kaggle.com/nickhould/craft-cans
- https://data.world/datafiniti/breweries-brew-pubs-in-the-usa
- https://www.reddit.com/r/datasets/comments/6i0v3g/craft_beer_dataset/

- https://github.com/nickhould/craft-beers-dataset
- https://catalog.data.gov/dataset?tags=beer
- https://catalog.data.gov/dataset/yearly-statistical-beer-data-by-state-2007-2016
- https://catalog.data.gov/dataset/beer-production-and-operations-reports
- https://catalog.data.gov/dataset/brewery-count-by-state-1984-march-31-2017
- https://catalog.data.gov/dataset/brewery-count-by-state-1984-march-31-2018
- https://www.ttb.gov/foia/frl.shtml