

Nof1_trial_Slides

August 5, 2019

1 Effects of Inhibition on Trial Signals in 'numberStarred' Game

1.1 N of 1 Trial Study

1.1.1 By Marko Seslija

```
[33]: from notebook.services.config import ConfigManager
      cm = ConfigManager()
      cm.update('livereveal', {
              'scroll': True,
      })
      """
```

```
[33]: ''
```

1.2 Abstract

- In this notebook we explore the effects of inhibition on the movement sensors data.
- This is an N of 1 trial. We exclusively concentrate on a specific (any) individual.

1.3 2nd Order Statistics of Trajectories

- Load the data by running *parserGP.py*.
- Fit Gaussian processes to the triggering angle (one that causes app to register event) and the remaining angle.
- We use standar RBF kernel.

```
[1]: %run -i 'parserGP.py'
```

```
ID: 35  Game: numbersStarred  Session: 0  Window: 0  Time: 2019-02-09
14:55:54.688111
ID: 35  Game: numbersStarred  Session: 0  Window: 1  Time: 2019-02-09
14:55:57.943308
ID: 35  Game: numbersStarred  Session: 0  Window: 2  Time: 2019-02-09
14:55:59.860083
ID: 35  Game: numbersStarred  Session: 0  Window: 3  Time: 2019-02-09
```

14:56:06.911953				
ID: 35	Game: numbersStarred	Session: 0	Window: 4	Time: 2019-02-09
14:56:11.610703				
ID: 35	Game: numbersStarred	Session: 0	Window: 5	Time: 2019-02-09
14:56:26.061551				
ID: 35	Game: numbersStarred	Session: 0	Window: 6	Time: 2019-02-09
14:56:37.474946				
ID: 35	Game: numbersStarred	Session: 0	Window: 7	Time: 2019-02-09
14:56:41.129030				
ID: 35	Game: numbersStarred	Session: 0	Window: 8	Time: 2019-02-09
14:56:43.012483				
ID: 35	Game: numbersStarred	Session: 0	Window: 9	Time: 2019-02-09
14:56:44.762590				
ID: 35	Game: numbersStarred	Session: 0	Window: 10	Time: 2019-02-09
14:56:48.262784				
ID: 35	Game: numbersStarred	Session: 0	Window: 11	Time: 2019-02-09
14:57:00.413431				
ID: 35	Game: numbersStarred	Session: 0	Window: 12	Time: 2019-02-09
14:57:04.781522				
ID: 35	Game: numbersStarred	Session: 0	Window: 13	Time: 2019-02-09
14:57:06.613794				
ID: 35	Game: numbersStarred	Session: 0	Window: 14	Time: 2019-02-09
14:57:12.114125				
ID: 35	Game: numbersStarred	Session: 0	Window: 15	Time: 2019-02-09
14:57:16.230990				
ID: 35	Game: numbersStarred	Session: 0	Window: 16	Time: 2019-02-09
14:57:20.082642				
ID: 35	Game: numbersStarred	Session: 0	Window: 17	Time: 2019-02-09
14:57:22.948107				
ID: 35	Game: numbersStarred	Session: 0	Window: 18	Time: 2019-02-09
14:57:25.432783				
ID: 35	Game: numbersStarred	Session: 0	Window: 19	Time: 2019-02-09
14:57:29.231752				
ID: 35	Game: numbersStarred	Session: 0	Window: 20	Time: 2019-02-09
14:57:37.648880				
ID: 35	Game: numbersStarred	Session: 0	Window: 21	Time: 2019-02-09
14:57:41.782431				
ID: 35	Game: numbersStarred	Session: 0	Window: 22	Time: 2019-02-09
14:57:43.965913				
ID: 35	Game: numbersStarred	Session: 0	Window: 23	Time: 2019-02-09
14:57:46.000495				
ID: 35	Game: numbersStarred	Session: 0	Window: 24	Time: 2019-02-09
14:57:48.349477				
ID: 35	Game: numbersStarred	Session: 0	Window: 25	Time: 2019-02-09
14:57:52.833110				
ID: 35	Game: numbersStarred	Session: 0	Window: 26	Time: 2019-02-09
14:57:55.016540				
ID: 35	Game: numbersStarred	Session: 0	Window: 27	Time: 2019-02-09

14:57:58.000008
ID: 35 Game: numbersStarred Session: 0 Window: 28 Time: 2019-02-09
14:58:01.800219
ID: 35 Game: numbersStarred Session: 0 Window: 29 Time: 2019-02-09
14:58:07.117167
ID: 35 Game: numbersStarred Session: 0 Window: 30 Time: 2019-02-09
14:58:23.164126
ID: 35 Game: numbersStarred Session: 0 Window: 31 Time: 2019-02-09
14:58:25.684879
ID: 35 Game: numbersStarred Session: 0 Window: 32 Time: 2019-02-09
14:58:28.703301
ID: 35 Game: numbersStarred Session: 0 Window: 33 Time: 2019-02-09
14:58:31.485244
ID: 35 Game: numbersStarred Session: 0 Window: 34 Time: 2019-02-09
14:58:35.385454
ID: 35 Game: numbersStarred Session: 0 Window: 35 Time: 2019-02-09
14:58:37.969016
ID: 35 Game: numbersStarred Session: 0 Window: 36 Time: 2019-02-09
14:58:41.370221
ID: 35 Game: numbersStarred Session: 0 Window: 37 Time: 2019-02-09
14:58:45.002637
ID: 35 Game: numbersStarred Session: 0 Window: 38 Time: 2019-02-09
14:58:49.652940
ID: 35 Game: numbersStarred Session: 0 Window: 39 Time: 2019-02-09
14:58:54.069840
ID: 35 Game: numbersStarred Session: 0 Window: 40 Time: 2019-02-09
14:58:59.320090
ID: 35 Game: numbersStarred Session: 0 Window: 41 Time: 2019-02-09
14:59:02.488146
ID: 35 Game: numbersStarred Session: 0 Window: 42 Time: 2019-02-09
14:59:06.753859
ID: 35 Game: numbersStarred Session: 0 Window: 43 Time: 2019-02-09
14:59:14.570957
ID: 35 Game: numbersStarred Session: 0 Window: 44 Time: 2019-02-09
14:59:23.272856
ID: 35 Game: numbersStarred Session: 0 Window: 45 Time: 2019-02-09
14:59:25.154879
ID: 35 Game: numbersStarred Session: 0 Window: 46 Time: 2019-02-09
14:59:27.555032
ID: 35 Game: numbersStarred Session: 0 Window: 47 Time: 2019-02-09
14:59:29.405180
ID: 35 Game: numbersStarred Session: 0 Window: 48 Time: 2019-02-09
14:59:32.522018
ID: 35 Game: numbersStarred Session: 0 Window: 49 Time: 2019-02-09
14:59:35.523136
ID: 35 Game: numbersStarred Session: 0 Window: 50 Time: 2019-02-09
14:59:39.405680
ID: 35 Game: numbersStarred Session: 0 Window: 51 Time: 2019-02-09

```

14:59:44.672687
ID: 35 Game: numbersStarred Session: 0 Window: 52 Time: 2019-02-09
14:59:48.156186
ID: 35 Game: numbersStarred Session: 0 Window: 53 Time: 2019-02-09
14:59:52.057420
ID: 35 Game: numbersStarred Session: 0 Window: 54 Time: 2019-02-09
14:59:55.123236
ID: 35 Game: numbersStarred Session: 0 Window: 55 Time: 2019-02-09
14:59:57.623421
ID: 35 Game: numbersStarred Session: 0 Window: 56 Time: 2019-02-09
14:59:59.323465
ID: 35 Game: numbersStarred Session: 0 Window: 57 Time: 2019-02-09
15:00:02.223615
ID: 35 Game: numbersStarred Session: 0 Window: 58 Time: 2019-02-09
15:00:11.574177
ID: 35 Game: numbersStarred Session: 0 Window: 59 Time: 2019-02-09
15:00:15.892215
ID: 35 Game: numbersStarred Session: 0 Window: 60 Time: 2019-02-09
15:00:23.141452
ID: 35 Game: numbersStarred Session: 0 Window: 61 Time: 2019-02-09
15:00:26.141680

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

```

ID: 35 Game: numbersStarred Session: 1 Window: 0 Time: 2019-02-10
21:16:55.530098
ID: 35 Game: numbersStarred Session: 1 Window: 1 Time: 2019-02-10
21:17:01.182760
ID: 35 Game: numbersStarred Session: 1 Window: 2 Time: 2019-02-10
21:17:03.084077
ID: 35 Game: numbersStarred Session: 1 Window: 3 Time: 2019-02-10
21:17:05.766314
ID: 35 Game: numbersStarred Session: 1 Window: 4 Time: 2019-02-10
21:17:20.568981
ID: 35 Game: numbersStarred Session: 1 Window: 6 Time: 2019-02-10
21:17:47.149776
ID: 35 Game: numbersStarred Session: 1 Window: 7 Time: 2019-02-10
21:17:58.037137
ID: 35 Game: numbersStarred Session: 1 Window: 8 Time: 2019-02-10
21:17:59.835924
ID: 35 Game: numbersStarred Session: 1 Window: 9 Time: 2019-02-10
21:18:03.586103
ID: 35 Game: numbersStarred Session: 1 Window: 10 Time: 2019-02-10

```

21:18:08.687673
ID: 35 Game: numbersStarred Session: 1 Window: 11 Time: 2019-02-10
21:18:11.269819
ID: 35 Game: numbersStarred Session: 1 Window: 12 Time: 2019-02-10
21:18:13.937815
ID: 35 Game: numbersStarred Session: 1 Window: 13 Time: 2019-02-10
21:18:16.653427
ID: 35 Game: numbersStarred Session: 1 Window: 14 Time: 2019-02-10
21:18:18.553596
ID: 35 Game: numbersStarred Session: 1 Window: 15 Time: 2019-02-10
21:18:21.538343
ID: 35 Game: numbersStarred Session: 1 Window: 16 Time: 2019-02-10
21:18:24.920588
ID: 35 Game: numbersStarred Session: 1 Window: 17 Time: 2019-02-10
21:18:28.005366
ID: 35 Game: numbersStarred Session: 1 Window: 18 Time: 2019-02-10
21:18:30.655120

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 35 Game: numbersStarred Session: 2 Window: 0 Time: 2019-02-11
09:02:47.726573
ID: 35 Game: numbersStarred Session: 2 Window: 1 Time: 2019-02-11
09:02:50.699184
ID: 35 Game: numbersStarred Session: 2 Window: 2 Time: 2019-02-11
09:02:52.365846
ID: 35 Game: numbersStarred Session: 2 Window: 3 Time: 2019-02-11
09:02:56.266039
ID: 35 Game: numbersStarred Session: 2 Window: 4 Time: 2019-02-11
09:02:59.382842
ID: 35 Game: numbersStarred Session: 2 Window: 5 Time: 2019-02-11
09:03:02.082986
ID: 35 Game: numbersStarred Session: 2 Window: 6 Time: 2019-02-11
09:03:03.999741
ID: 35 Game: numbersStarred Session: 2 Window: 7 Time: 2019-02-11
09:03:06.668138
ID: 35 Game: numbersStarred Session: 2 Window: 8 Time: 2019-02-11
09:03:08.549970
ID: 35 Game: numbersStarred Session: 2 Window: 9 Time: 2019-02-11
09:03:10.450118
ID: 35 Game: numbersStarred Session: 2 Window: 10 Time: 2019-02-11
09:03:14.233612
ID: 35 Game: numbersStarred Session: 2 Window: 11 Time: 2019-02-11

```

09:03:25.134246
ID: 35 Game: numbersStarred Session: 2 Window: 12 Time: 2019-02-11
09:03:28.367636
ID: 35 Game: numbersStarred Session: 2 Window: 13 Time: 2019-02-11
09:03:31.286492
ID: 35 Game: numbersStarred Session: 2 Window: 14 Time: 2019-02-11
09:03:35.551336
ID: 35 Game: numbersStarred Session: 2 Window: 15 Time: 2019-02-11
09:03:37.951509
ID: 35 Game: numbersStarred Session: 2 Window: 16 Time: 2019-02-11
09:03:40.201576
ID: 35 Game: numbersStarred Session: 2 Window: 17 Time: 2019-02-11
09:03:43.785145
ID: 35 Game: numbersStarred Session: 2 Window: 18 Time: 2019-02-11
09:03:45.835230
ID: 35 Game: numbersStarred Session: 2 Window: 19 Time: 2019-02-11
09:03:49.752076
ID: 35 Game: numbersStarred Session: 2 Window: 20 Time: 2019-02-11
09:03:54.685660
ID: 35 Game: numbersStarred Session: 2 Window: 21 Time: 2019-02-11
09:03:57.402464
ID: 35 Game: numbersStarred Session: 2 Window: 22 Time: 2019-02-11
09:03:59.837356
ID: 35 Game: numbersStarred Session: 2 Window: 23 Time: 2019-02-11
09:04:02.669469
ID: 35 Game: numbersStarred Session: 2 Window: 24 Time: 2019-02-11
09:04:06.120541
ID: 35 Game: numbersStarred Session: 2 Window: 25 Time: 2019-02-11
09:04:09.086369
ID: 35 Game: numbersStarred Session: 2 Window: 26 Time: 2019-02-11
09:04:12.071185
ID: 35 Game: numbersStarred Session: 2 Window: 27 Time: 2019-02-11
09:04:14.503326
ID: 35 Game: numbersStarred Session: 2 Window: 28 Time: 2019-02-11
09:04:16.771554
ID: 35 Game: numbersStarred Session: 2 Window: 29 Time: 2019-02-11
09:04:21.770349
ID: 35 Game: numbersStarred Session: 2 Window: 30 Time: 2019-02-11
09:04:24.987226
ID: 35 Game: numbersStarred Session: 2 Window: 31 Time: 2019-02-11
09:04:27.388593

```

```

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
RuntimeWarning: Mean of empty slice.
    out=out, **kwargs)
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
RuntimeWarning: invalid value encountered in double_scalars
    ret = ret.dtype.type(ret / rcount)

```

ID: 35	Game: numbersStarred	Session: 3	Window: 0	Time: 2019-02-11
13:56:19.836343				
ID: 35	Game: numbersStarred	Session: 3	Window: 1	Time: 2019-02-11
13:56:24.041281				
ID: 35	Game: numbersStarred	Session: 3	Window: 2	Time: 2019-02-11
13:56:29.708244				
ID: 35	Game: numbersStarred	Session: 3	Window: 3	Time: 2019-02-11
13:56:32.525121				
ID: 35	Game: numbersStarred	Session: 3	Window: 4	Time: 2019-02-11
13:56:35.725299				
ID: 35	Game: numbersStarred	Session: 3	Window: 5	Time: 2019-02-11
13:56:40.392231				
ID: 35	Game: numbersStarred	Session: 3	Window: 6	Time: 2019-02-11
13:56:43.959172				
ID: 35	Game: numbersStarred	Session: 3	Window: 7	Time: 2019-02-11
13:56:46.225771				
ID: 35	Game: numbersStarred	Session: 3	Window: 8	Time: 2019-02-11
13:56:48.625948				
ID: 35	Game: numbersStarred	Session: 3	Window: 9	Time: 2019-02-11
13:56:50.059379				
ID: 35	Game: numbersStarred	Session: 3	Window: 10	Time: 2019-02-11
13:56:54.142863				
ID: 35	Game: numbersStarred	Session: 3	Window: 11	Time: 2019-02-11
13:56:56.976344				
ID: 35	Game: numbersStarred	Session: 3	Window: 12	Time: 2019-02-11
13:56:59.559830				
ID: 35	Game: numbersStarred	Session: 3	Window: 13	Time: 2019-02-11
13:57:01.259900				
ID: 35	Game: numbersStarred	Session: 3	Window: 14	Time: 2019-02-11
13:57:04.910091				
ID: 35	Game: numbersStarred	Session: 3	Window: 15	Time: 2019-02-11
13:57:08.476971				
ID: 35	Game: numbersStarred	Session: 3	Window: 16	Time: 2019-02-11
13:57:11.627106				
ID: 35	Game: numbersStarred	Session: 3	Window: 17	Time: 2019-02-11
13:57:13.910572				
ID: 35	Game: numbersStarred	Session: 3	Window: 18	Time: 2019-02-11
13:57:16.260702				
ID: 35	Game: numbersStarred	Session: 3	Window: 19	Time: 2019-02-11
13:57:17.810775				
ID: 35	Game: numbersStarred	Session: 3	Window: 20	Time: 2019-02-11
13:57:19.827560				
ID: 35	Game: numbersStarred	Session: 3	Window: 21	Time: 2019-02-11
13:57:22.044322				
ID: 35	Game: numbersStarred	Session: 3	Window: 22	Time: 2019-02-11
13:57:24.611221				
ID: 35	Game: numbersStarred	Session: 3	Window: 23	Time: 2019-02-11
13:57:28.044658				

ID: 35	Game: numbersStarred	Session: 3	Window: 24	Time: 2019-02-11 13:57:30.811465
ID: 35	Game: numbersStarred	Session: 3	Window: 25	Time: 2019-02-11 13:57:33.894989
ID: 35	Game: numbersStarred	Session: 3	Window: 26	Time: 2019-02-11 13:57:35.545137
ID: 35	Game: numbersStarred	Session: 3	Window: 27	Time: 2019-02-11 13:57:37.745348
ID: 35	Game: numbersStarred	Session: 3	Window: 28	Time: 2019-02-11 13:57:40.045211
ID: 35	Game: numbersStarred	Session: 3	Window: 29	Time: 2019-02-11 13:57:43.428771
ID: 35	Game: numbersStarred	Session: 3	Window: 30	Time: 2019-02-11 13:57:46.145629
ID: 35	Game: numbersStarred	Session: 3	Window: 31	Time: 2019-02-11 13:57:51.331641

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
RuntimeWarning: Mean of empty slice.
    out=out, **kwargs)
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
RuntimeWarning: invalid value encountered in double_scalars
    ret = ret.dtype.type(ret / rcount)
```

ID: 35	Game: numbersStarred	Session: 4	Window: 0	Time: 2019-02-12 09:31:17.914885
ID: 35	Game: numbersStarred	Session: 4	Window: 1	Time: 2019-02-12 09:31:20.151089
ID: 35	Game: numbersStarred	Session: 4	Window: 2	Time: 2019-02-12 09:31:21.467788
ID: 35	Game: numbersStarred	Session: 4	Window: 3	Time: 2019-02-12 09:31:24.868065
ID: 35	Game: numbersStarred	Session: 4	Window: 4	Time: 2019-02-12 09:31:27.051416
ID: 35	Game: numbersStarred	Session: 4	Window: 5	Time: 2019-02-12 09:31:28.818162
ID: 35	Game: numbersStarred	Session: 4	Window: 6	Time: 2019-02-12 09:31:30.401603
ID: 35	Game: numbersStarred	Session: 4	Window: 7	Time: 2019-02-12 09:31:32.018409
ID: 35	Game: numbersStarred	Session: 4	Window: 8	Time: 2019-02-12 09:31:34.603134
ID: 35	Game: numbersStarred	Session: 4	Window: 9	Time: 2019-02-12 09:31:37.035278
ID: 35	Game: numbersStarred	Session: 4	Window: 10	Time: 2019-02-12 09:31:39.953552
ID: 35	Game: numbersStarred	Session: 4	Window: 11	Time: 2019-02-12 09:31:41.670444

ID: 35	Game: numbersStarred	Session: 4	Window: 12	Time: 2019-02-12
09:31:43.270058				
ID: 35	Game: numbersStarred	Session: 4	Window: 13	Time: 2019-02-12
09:31:45.702396				
ID: 35	Game: numbersStarred	Session: 4	Window: 14	Time: 2019-02-12
09:31:49.637416				
ID: 35	Game: numbersStarred	Session: 4	Window: 15	Time: 2019-02-12
09:31:51.721304				
ID: 35	Game: numbersStarred	Session: 4	Window: 16	Time: 2019-02-12
09:31:54.820826				
ID: 35	Game: numbersStarred	Session: 4	Window: 17	Time: 2019-02-12
09:31:57.136693				
ID: 35	Game: numbersStarred	Session: 4	Window: 18	Time: 2019-02-12
09:32:00.269855				
ID: 35	Game: numbersStarred	Session: 4	Window: 19	Time: 2019-02-12
09:32:03.271319				
ID: 35	Game: numbersStarred	Session: 4	Window: 20	Time: 2019-02-12
09:32:05.353427				
ID: 35	Game: numbersStarred	Session: 4	Window: 21	Time: 2019-02-12
09:32:09.703775				
ID: 35	Game: numbersStarred	Session: 4	Window: 22	Time: 2019-02-12
09:32:12.320514				
ID: 35	Game: numbersStarred	Session: 4	Window: 23	Time: 2019-02-12
09:32:16.454029				
ID: 35	Game: numbersStarred	Session: 4	Window: 24	Time: 2019-02-12
09:32:18.570810				
ID: 35	Game: numbersStarred	Session: 4	Window: 25	Time: 2019-02-12
09:32:19.970864				
ID: 35	Game: numbersStarred	Session: 4	Window: 26	Time: 2019-02-12
09:32:22.554376				
ID: 35	Game: numbersStarred	Session: 4	Window: 27	Time: 2019-02-12
09:32:25.671227				
ID: 35	Game: numbersStarred	Session: 4	Window: 28	Time: 2019-02-12
09:32:28.371349				
ID: 35	Game: numbersStarred	Session: 4	Window: 29	Time: 2019-02-12
09:32:30.971479				
ID: 35	Game: numbersStarred	Session: 4	Window: 30	Time: 2019-02-12
09:32:32.838278				
ID: 35	Game: numbersStarred	Session: 4	Window: 31	Time: 2019-02-12
09:32:34.573085				

Average time of completion of numbersStarred in consecutive sessions
[2.84973593 2.86168225 2.31845416 2.10353207 1.79486212]

Number of incorrect answers
[5, 3, 2, 2, 0]

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
RuntimeWarning: Mean of empty slice.
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
RuntimeWarning: invalid value encountered in double_scalars
    ret = ret.dtype.type(ret / rcount)
```

<Figure size 640x480 with 1 Axes>

<Figure size 1200x600 with 1 Axes>

```
Correlation between event and reaction times: nan
Correlation between event and reaction times without nans: 0.9947582766727342
Correlation between event times without nans and L1: 0.15964043067053865
Total incorrect (%):          6.779661016949152
Incorrect with Star (%):      41.66666666666667
Fallen for Star (%):          16.666666666666664
Incorrect without Star (%):    58.333333333333336
Incorrect with flip (%):       0.0
Incorrect without flip (%):    100.0
Total incorrect via flip (%):  100.0
Total incorr. with lure (%):   66.66666666666666
Incorr. 2nd and 3rd attempt:   8.333333333333332
```

<Figure size 640x480 with 1 Axes>

- Code for fitting Gaussian processes to response trajectories.

```
[2]: from sklearn.kernel_ridge import KernelRidge
from sklearn.model_selection import GridSearchCV
from sklearn.gaussian_process import GaussianProcessRegressor
from sklearn.gaussian_process.kernels import WhiteKernel, ExpSineSquared, RBF

def fitGPs():
    # correct signals with Star
    data_Star = signals_trigger[numpy.where((corrIncorr_label==1) &
    →(array_st_all==1))]
    # correct signals without Star
    data_noStar = signals_trigger[numpy.where((corrIncorr_label==1) &
    →(array_st_all==0))]

    time_Star = numpy.zeros(shape=(int(len(data_Star)*101)), dtype=float)
    y_Star = numpy.zeros(shape=(int(len(data_Star)*101)), dtype=float)
    t_int_Star = numpy.array([i for i in range(0,101)])
    for j in range(int(len(data_Star))):
        for i in range(101):
            time_Star[j*101+i] = t_int_Star[i] + 0.01*numpy.random.uniform()
```

```

        y_Star[j*101+i] = data_Star[j,i]

time_noStar = numpy.zeros(shape=(int(len(data_noStar)*101)), dtype=float)
y_noStar = numpy.zeros(shape=(int(len(data_noStar)*101)), dtype=float)
t_int_noStar = numpy.array([i for i in range(0,101)])
for j in range(int(len(data_noStar))):
    for i in range(101):
        time_noStar[j*101+i] = t_int_noStar[i] + 0.01*numpy.random.uniform()
        y_noStar[j*101+i] = data_noStar[j,i]

rng = numpy.random.RandomState(0)

# Star
y = y_Star[~numpy.isnan(y_Star.reshape(-1,1)).any(axis=1)]
t = time_Star[numpy.where(~numpy.isnan(y_Star))].T
data_Star = numpy.vstack((t,y)).T

mask_Star = numpy.random.choice([False, True], len(data_Star), p=[0.75, 0.
→25])
data_sampled_Star = data_Star[mask_Star]
t_data_Star = data_sampled_Star[:,0]
y_data_Star = data_sampled_Star[:,1]

# noStar
y = y_noStar[~numpy.isnan(y_noStar.reshape(-1,1)).any(axis=1)]
t = time_noStar[numpy.where(~numpy.isnan(y_noStar))].T
data_noStar = numpy.vstack((t,y)).T

mask_noStar = numpy.random.choice([False, True], len(data_noStar), p=[0.75,
→0.25])
data_sampled_noStar = data_noStar[mask_noStar]
t_data_noStar = data_sampled_noStar[:,0]
y_data_noStar = data_sampled_noStar[:,1]

gp_kernel = 1.0 * RBF(length_scale=1.0, length_scale_bounds=(1e-1, 1e2)) \
            + WhiteKernel(1e-2)
gpr_Star = GaussianProcessRegressor(kernel=gp_kernel)
gpr_Star.fit(t_data_Star.reshape(-1,1), y_data_Star.reshape(-1,1))

gpr_noStar = GaussianProcessRegressor(kernel=gp_kernel)
gpr_noStar.fit(t_data_noStar.reshape(-1,1), y_data_noStar.reshape(-1,1))

# make predictions and plot
t_plot = t_int_Star.reshape(-1,1)
y_gpr_Star, y_std_Star = gpr_Star.predict(t_plot, return_std=True)
y_gpr_noStar, y_std_noStar = gpr_noStar.predict(t_plot, return_std=True)

```

```

plt.figure(figsize=(10, 5))
plt.scatter(t_data_Star, y_data_Star, c='orangered', s=20, marker=(5, 2),
→label='data with Star')
plt.scatter(t_data_noStar, y_data_noStar, c='dodgerblue', s=20, label='data_
→without Star')
plt.plot(t_plot, y_gpr_Star, color='orangered', lw=3,
         label='mean GP with Star')
plt.fill_between(t_plot.ravel(), (y_gpr_Star - 2*y_std_Star.reshape(-1,1)).
→ravel(),
                 (y_gpr_Star + 2*y_std_Star.reshape(-1,1)).ravel(),
→color='darkorange',
                 alpha=0.3)
plt.plot(t_plot, y_gpr_noStar, color='royalblue', lw=3,
         label='mean GP without Star')
plt.fill_between(t_plot.ravel(), (y_gpr_noStar - 2*y_std_noStar.
→reshape(-1,1)).ravel(),
                 (y_gpr_noStar + 2*y_std_noStar.reshape(-1,1)).ravel(),
→color='lightskyblue',
                 alpha=0.3)
plt.xlabel('time samples')
plt.ylabel('triggering angle')
plt.legend()
plt.show()

```

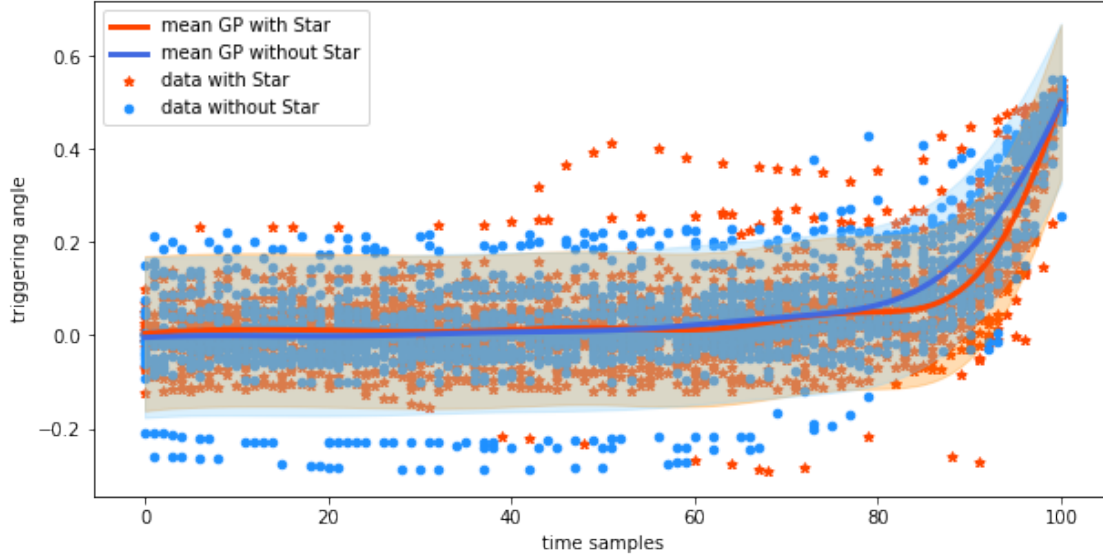
1.4 Fitting GPs

- Let us take a look how on average angle responses look when **Star** cursor is present and when it is absent.
- We discard first 150 ms of the response and map all responses $r_i(t)$, $t \in [150\text{ ms}, T_i]$, to $\text{sign}(r_i(T_i)) r_i(t)$, where T_i is the Event Time of i -th response r_i .
- Scale all $[150\text{ ms}, T_i]$ to $[0, 100]$.

```

[4]: # Fit Gaussian processes with RBFs
fitGPs()

```



- As we can see, it is very difficult to notice any difference on the basis of GPs.
- This motivates us to construct performance measures, which aim to capture a subtle difference in trajectories.

1.5 Output Measures

- For the response Euler angles $\alpha(t), \beta(t), \gamma(t)$, we focus on a triggering angle α (the one that causes an event to be recorded) and a following angle β .
- We disregard the third angle.
- L_1 -norms:

$$\|\alpha(t)\| = \frac{1}{T} \int_0^T \left| \frac{1}{2} - \text{sign}(\alpha(T)) \alpha(t) \right| dt$$

$$\|\beta(t)\| = \frac{1}{T} \int_0^T |\beta(t)| dt$$

- Maximal Deviation in the opposite direction
- Number of turns a signal makes (characterized by change of the gradient)
- Sample Entropy

1.6 Computing Output Measures

Load the Python script which will extract the outcome measures for us.

```
[6]: %run -i 'parserStarNof1.py'
```

ID: 38	Game: numbersStarred	Session: 0	Window: 0	Time: 2018-08-04 07:37:41.182310
ID: 38	Game: numbersStarred	Session: 0	Window: 1	Time: 2018-08-04 07:37:43.778350
ID: 38	Game: numbersStarred	Session: 0	Window: 2	Time: 2018-08-04 07:37:46.112150
ID: 38	Game: numbersStarred	Session: 0	Window: 3	Time: 2018-08-04 07:37:47.779200
ID: 38	Game: numbersStarred	Session: 0	Window: 4	Time: 2018-08-04 07:37:57.351560
ID: 38	Game: numbersStarred	Session: 0	Window: 5	Time: 2018-08-04 07:37:59.797620
ID: 38	Game: numbersStarred	Session: 0	Window: 6	Time: 2018-08-04 07:38:03.799790
ID: 38	Game: numbersStarred	Session: 0	Window: 7	Time: 2018-08-04 07:38:06.465590
ID: 38	Game: numbersStarred	Session: 0	Window: 8	Time: 2018-08-04 07:38:11.564260
ID: 38	Game: numbersStarred	Session: 0	Window: 9	Time: 2018-08-04 07:38:16.948510
ID: 38	Game: numbersStarred	Session: 0	Window: 10	Time: 2018-08-04 07:38:20.367890
ID: 38	Game: numbersStarred	Session: 0	Window: 11	Time: 2018-08-04 07:38:23.817800
ID: 38	Game: numbersStarred	Session: 0	Window: 12	Time: 2018-08-04 07:38:26.683300
ID: 38	Game: numbersStarred	Session: 0	Window: 13	Time: 2018-08-04 07:38:31.549790
ID: 38	Game: numbersStarred	Session: 0	Window: 14	Time: 2018-08-04 07:38:33.934440
ID: 38	Game: numbersStarred	Session: 0	Window: 15	Time: 2018-08-04 07:38:37.035450
ID: 38	Game: numbersStarred	Session: 0	Window: 16	Time: 2018-08-04 07:38:39.037010
ID: 38	Game: numbersStarred	Session: 0	Window: 17	Time: 2018-08-04 07:38:41.300090
ID: 38	Game: numbersStarred	Session: 0	Window: 18	Time: 2018-08-04 07:38:43.652840
ID: 38	Game: numbersStarred	Session: 0	Window: 19	Time: 2018-08-04 07:38:47.235130
ID: 38	Game: numbersStarred	Session: 0	Window: 20	Time: 2018-08-04 07:38:50.432710
ID: 38	Game: numbersStarred	Session: 0	Window: 21	Time: 2018-08-04 07:38:52.701490
ID: 38	Game: numbersStarred	Session: 0	Window: 22	Time: 2018-08-04 07:38:54.650730

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 1 Window: 0 Time: 2018-08-04
12:47:31.165650

ID: 38 Game: numbersStarred Session: 1 Window: 1 Time: 2018-08-04
12:47:35.423130

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 5 Window: 0 Time: 2018-08-06
08:02:22.600340

ID: 38 Game: numbersStarred Session: 5 Window: 1 Time: 2018-08-06
08:02:24.792630

ID: 38 Game: numbersStarred Session: 5 Window: 2 Time: 2018-08-06
08:02:27.993580

ID: 38 Game: numbersStarred Session: 5 Window: 3 Time: 2018-08-06
08:02:30.976780

ID: 38 Game: numbersStarred Session: 5 Window: 4 Time: 2018-08-06
08:02:33.461670

ID: 38 Game: numbersStarred Session: 5 Window: 5 Time: 2018-08-06
08:02:35.693890

ID: 38 Game: numbersStarred Session: 5 Window: 6 Time: 2018-08-06
08:02:37.394700

ID: 38 Game: numbersStarred Session: 5 Window: 7 Time: 2018-08-06
08:02:38.760460

ID: 38 Game: numbersStarred Session: 5 Window: 8 Time: 2018-08-06
08:02:40.211120

ID: 38 Game: numbersStarred Session: 5 Window: 9 Time: 2018-08-06
08:02:42.028920

ID: 38 Game: numbersStarred Session: 5 Window: 10 Time: 2018-08-06
08:02:46.427740

ID: 38 Game: numbersStarred Session: 5 Window: 11 Time: 2018-08-06
08:02:48.878350

ID: 38 Game: numbersStarred Session: 5 Window: 12 Time: 2018-08-06
08:02:51.113030

ID: 38 Game: numbersStarred Session: 5 Window: 13 Time: 2018-08-06
08:02:53.928280

ID: 38 Game: numbersStarred Session: 5 Window: 14 Time: 2018-08-06
08:02:55.362370

ID: 38	Game: numbersStarred	Session: 5	Window: 15	Time: 2018-08-06 08:02:56.964160
ID: 38	Game: numbersStarred	Session: 5	Window: 16	Time: 2018-08-06 08:03:01.045980
ID: 38	Game: numbersStarred	Session: 5	Window: 17	Time: 2018-08-06 08:03:03.298430
ID: 38	Game: numbersStarred	Session: 5	Window: 18	Time: 2018-08-06 08:03:05.712920
ID: 38	Game: numbersStarred	Session: 5	Window: 19	Time: 2018-08-06 08:03:07.713270
ID: 38	Game: numbersStarred	Session: 5	Window: 20	Time: 2018-08-06 08:03:09.347330
ID: 38	Game: numbersStarred	Session: 5	Window: 21	Time: 2018-08-06 08:03:11.231720
ID: 38	Game: numbersStarred	Session: 5	Window: 22	Time: 2018-08-06 08:03:13.930320
ID: 38	Game: numbersStarred	Session: 5	Window: 23	Time: 2018-08-06 08:03:16.564650
ID: 38	Game: numbersStarred	Session: 5	Window: 24	Time: 2018-08-06 08:03:18.614460
ID: 38	Game: numbersStarred	Session: 5	Window: 25	Time: 2018-08-06 08:03:20.197950
ID: 38	Game: numbersStarred	Session: 5	Window: 26	Time: 2018-08-06 08:03:21.665470

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

ID: 38	Game: numbersStarred	Session: 6	Window: 0	Time: 2018-08-06 13:00:01.612430
ID: 38	Game: numbersStarred	Session: 6	Window: 1	Time: 2018-08-06 13:00:08.627070
ID: 38	Game: numbersStarred	Session: 6	Window: 2	Time: 2018-08-06 13:00:10.743420
ID: 38	Game: numbersStarred	Session: 6	Window: 3	Time: 2018-08-06 13:00:12.243510
ID: 38	Game: numbersStarred	Session: 6	Window: 4	Time: 2018-08-06 13:00:13.777590
ID: 38	Game: numbersStarred	Session: 6	Window: 5	Time: 2018-08-06 13:00:17.611350
ID: 38	Game: numbersStarred	Session: 6	Window: 6	Time: 2018-08-06 13:00:19.611890
ID: 38	Game: numbersStarred	Session: 6	Window: 7	Time: 2018-08-06 13:00:22.761450

ID: 38	Game: numbersStarred	Session: 6	Window: 8	Time: 2018-08-06
13:00:24.828830				
ID: 38	Game: numbersStarred	Session: 6	Window: 9	Time: 2018-08-06
13:00:27.629800				
ID: 38	Game: numbersStarred	Session: 6	Window: 10	Time: 2018-08-06
13:00:30.161710				
ID: 38	Game: numbersStarred	Session: 6	Window: 11	Time: 2018-08-06
13:00:32.429400				
ID: 38	Game: numbersStarred	Session: 6	Window: 12	Time: 2018-08-06
13:00:35.314750				
ID: 38	Game: numbersStarred	Session: 6	Window: 13	Time: 2018-08-06
13:00:38.711910				
ID: 38	Game: numbersStarred	Session: 6	Window: 14	Time: 2018-08-06
13:00:41.765940				
ID: 38	Game: numbersStarred	Session: 6	Window: 15	Time: 2018-08-06
13:00:43.762030				
ID: 38	Game: numbersStarred	Session: 6	Window: 16	Time: 2018-08-06
13:00:46.698020				
ID: 38	Game: numbersStarred	Session: 6	Window: 17	Time: 2018-08-06
13:00:48.431740				
ID: 38	Game: numbersStarred	Session: 6	Window: 18	Time: 2018-08-06
13:00:52.646210				
ID: 38	Game: numbersStarred	Session: 6	Window: 19	Time: 2018-08-06
13:00:58.114930				
ID: 38	Game: numbersStarred	Session: 6	Window: 20	Time: 2018-08-06
13:01:01.947720				
ID: 38	Game: numbersStarred	Session: 6	Window: 21	Time: 2018-08-06
13:01:04.349260				
ID: 38	Game: numbersStarred	Session: 6	Window: 22	Time: 2018-08-06
13:01:06.999810				
ID: 38	Game: numbersStarred	Session: 6	Window: 23	Time: 2018-08-06
13:01:08.699260				
ID: 38	Game: numbersStarred	Session: 6	Window: 24	Time: 2018-08-06
13:01:13.600670				
ID: 38	Game: numbersStarred	Session: 6	Window: 25	Time: 2018-08-06
13:01:19.348490				
ID: 38	Game: numbersStarred	Session: 6	Window: 26	Time: 2018-08-06
13:01:21.368200				
ID: 38	Game: numbersStarred	Session: 6	Window: 27	Time: 2018-08-06
13:01:22.949160				
ID: 38	Game: numbersStarred	Session: 6	Window: 28	Time: 2018-08-06
13:01:25.418640				
ID: 38	Game: numbersStarred	Session: 6	Window: 29	Time: 2018-08-06
13:01:28.585740				
ID: 38	Game: numbersStarred	Session: 6	Window: 30	Time: 2018-08-06
13:01:31.982490				
ID: 38	Game: numbersStarred	Session: 6	Window: 31	Time: 2018-08-06
13:01:33.817030				

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
RuntimeWarning: Mean of empty slice.
    out=out, **kwargs)
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
RuntimeWarning: invalid value encountered in double_scalars
    ret = ret.dtype.type(ret / rcount)
```

ID: 38	Game: numbersStarred	Session: 7	Window: 0	Time: 2018-08-06
21:37:31.849090				
ID: 38	Game: numbersStarred	Session: 7	Window: 1	Time: 2018-08-06
21:37:37.723570				
ID: 38	Game: numbersStarred	Session: 7	Window: 2	Time: 2018-08-06
21:37:39.106740				
ID: 38	Game: numbersStarred	Session: 7	Window: 3	Time: 2018-08-06
21:37:40.657540				
ID: 38	Game: numbersStarred	Session: 7	Window: 4	Time: 2018-08-06
21:37:44.391080				
ID: 38	Game: numbersStarred	Session: 7	Window: 5	Time: 2018-08-06
21:37:46.874000				
ID: 38	Game: numbersStarred	Session: 7	Window: 6	Time: 2018-08-06
21:37:49.157970				
ID: 38	Game: numbersStarred	Session: 7	Window: 7	Time: 2018-08-06
21:37:50.691080				
ID: 38	Game: numbersStarred	Session: 7	Window: 8	Time: 2018-08-06
21:37:53.707520				
ID: 38	Game: numbersStarred	Session: 7	Window: 9	Time: 2018-08-06
21:37:56.741300				
ID: 38	Game: numbersStarred	Session: 7	Window: 10	Time: 2018-08-06
21:37:59.324810				
ID: 38	Game: numbersStarred	Session: 7	Window: 11	Time: 2018-08-06
21:38:00.925080				
ID: 38	Game: numbersStarred	Session: 7	Window: 12	Time: 2018-08-06
21:38:03.110360				
ID: 38	Game: numbersStarred	Session: 7	Window: 13	Time: 2018-08-06
21:38:05.075170				
ID: 38	Game: numbersStarred	Session: 7	Window: 14	Time: 2018-08-06
21:38:08.025930				
ID: 38	Game: numbersStarred	Session: 7	Window: 15	Time: 2018-08-06
21:38:10.293370				
ID: 38	Game: numbersStarred	Session: 7	Window: 16	Time: 2018-08-06
21:38:12.143960				
ID: 38	Game: numbersStarred	Session: 7	Window: 17	Time: 2018-08-06
21:38:14.808730				
ID: 38	Game: numbersStarred	Session: 7	Window: 18	Time: 2018-08-06
21:38:17.496550				
ID: 38	Game: numbersStarred	Session: 7	Window: 19	Time: 2018-08-06
21:38:19.559960				
ID: 38	Game: numbersStarred	Session: 7	Window: 20	Time: 2018-08-06

```

21:38:24.495460
ID: 38 Game: numbersStarred Session: 7 Window: 21 Time: 2018-08-06
21:38:29.326580
ID: 38 Game: numbersStarred Session: 7 Window: 22 Time: 2018-08-06
21:38:31.911840
ID: 38 Game: numbersStarred Session: 7 Window: 23 Time: 2018-08-06
21:38:34.528540
ID: 38 Game: numbersStarred Session: 7 Window: 24 Time: 2018-08-06
21:38:36.878580
ID: 38 Game: numbersStarred Session: 7 Window: 25 Time: 2018-08-06
21:38:40.363130
ID: 38 Game: numbersStarred Session: 7 Window: 26 Time: 2018-08-06
21:38:43.145520
ID: 38 Game: numbersStarred Session: 7 Window: 27 Time: 2018-08-06
21:38:46.746040
ID: 38 Game: numbersStarred Session: 7 Window: 28 Time: 2018-08-06
21:38:49.794630
ID: 38 Game: numbersStarred Session: 7 Window: 29 Time: 2018-08-06
21:38:52.096920
ID: 38 Game: numbersStarred Session: 7 Window: 30 Time: 2018-08-06
21:38:54.613240
ID: 38 Game: numbersStarred Session: 7 Window: 31 Time: 2018-08-06
21:38:57.362880

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

```

ID: 38 Game: numbersStarred Session: 8 Window: 0 Time: 2018-08-07
07:54:42.132800
ID: 38 Game: numbersStarred Session: 8 Window: 1 Time: 2018-08-07
07:54:44.258630
ID: 38 Game: numbersStarred Session: 8 Window: 2 Time: 2018-08-07
07:54:45.491820
ID: 38 Game: numbersStarred Session: 8 Window: 3 Time: 2018-08-07
07:54:52.325530
ID: 38 Game: numbersStarred Session: 8 Window: 4 Time: 2018-08-07
07:54:54.793060
ID: 38 Game: numbersStarred Session: 8 Window: 5 Time: 2018-08-07
07:54:56.909370
ID: 38 Game: numbersStarred Session: 8 Window: 6 Time: 2018-08-07
07:55:00.077140
ID: 38 Game: numbersStarred Session: 8 Window: 7 Time: 2018-08-07
07:55:02.094460
ID: 38 Game: numbersStarred Session: 8 Window: 8 Time: 2018-08-07

```

```

07:55:03.677030
ID: 38 Game: numbersStarred Session: 8 Window: 9 Time: 2018-08-07
07:55:05.176510
ID: 38 Game: numbersStarred Session: 8 Window: 10 Time: 2018-08-07
07:55:09.744290
ID: 38 Game: numbersStarred Session: 8 Window: 11 Time: 2018-08-07
07:55:14.794150
ID: 38 Game: numbersStarred Session: 8 Window: 12 Time: 2018-08-07
07:55:17.111260
ID: 38 Game: numbersStarred Session: 8 Window: 13 Time: 2018-08-07
07:55:20.127830
ID: 38 Game: numbersStarred Session: 8 Window: 14 Time: 2018-08-07
07:55:21.744680
ID: 38 Game: numbersStarred Session: 8 Window: 15 Time: 2018-08-07
07:55:24.595000
ID: 38 Game: numbersStarred Session: 8 Window: 16 Time: 2018-08-07
07:55:30.916690
ID: 38 Game: numbersStarred Session: 8 Window: 17 Time: 2018-08-07
07:55:32.395860
ID: 38 Game: numbersStarred Session: 8 Window: 18 Time: 2018-08-07
07:55:33.595050
ID: 38 Game: numbersStarred Session: 8 Window: 19 Time: 2018-08-07
07:55:35.478840
ID: 38 Game: numbersStarred Session: 8 Window: 20 Time: 2018-08-07
07:55:36.928990
ID: 38 Game: numbersStarred Session: 8 Window: 21 Time: 2018-08-07
07:55:40.046650

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
ret = ret.dtype.type(ret / rcount)
```

```

ID: 38 Game: numbersStarred Session: 9 Window: 0 Time: 2018-08-07
12:51:48.904550
ID: 38 Game: numbersStarred Session: 9 Window: 1 Time: 2018-08-07
12:51:51.030440
ID: 38 Game: numbersStarred Session: 9 Window: 2 Time: 2018-08-07
12:51:53.747320
ID: 38 Game: numbersStarred Session: 9 Window: 3 Time: 2018-08-07
12:51:55.647490
ID: 38 Game: numbersStarred Session: 9 Window: 4 Time: 2018-08-07
12:51:58.115070
ID: 38 Game: numbersStarred Session: 9 Window: 5 Time: 2018-08-07
12:52:00.931360
ID: 38 Game: numbersStarred Session: 9 Window: 6 Time: 2018-08-07

```

12:52:02.815210				
ID: 38	Game: numbersStarred	Session: 9	Window: 7	Time: 2018-08-07
12:52:04.848720				
ID: 38	Game: numbersStarred	Session: 9	Window: 8	Time: 2018-08-07
12:52:07.764120				
ID: 38	Game: numbersStarred	Session: 9	Window: 9	Time: 2018-08-07
12:52:09.282840				
ID: 38	Game: numbersStarred	Session: 9	Window: 10	Time: 2018-08-07
12:52:12.015330				
ID: 38	Game: numbersStarred	Session: 9	Window: 11	Time: 2018-08-07
12:52:13.865250				
ID: 38	Game: numbersStarred	Session: 9	Window: 12	Time: 2018-08-07
12:52:15.581330				
ID: 38	Game: numbersStarred	Session: 9	Window: 13	Time: 2018-08-07
12:52:17.816770				
ID: 38	Game: numbersStarred	Session: 9	Window: 14	Time: 2018-08-07
12:52:20.681850				
ID: 38	Game: numbersStarred	Session: 9	Window: 15	Time: 2018-08-07
12:52:22.467790				
ID: 38	Game: numbersStarred	Session: 9	Window: 16	Time: 2018-08-07
12:52:25.616670				
ID: 38	Game: numbersStarred	Session: 9	Window: 17	Time: 2018-08-07
12:52:27.350840				
ID: 38	Game: numbersStarred	Session: 9	Window: 18	Time: 2018-08-07
12:52:28.915270				
ID: 38	Game: numbersStarred	Session: 9	Window: 19	Time: 2018-08-07
12:52:30.967860				
ID: 38	Game: numbersStarred	Session: 9	Window: 20	Time: 2018-08-07
12:52:32.550410				
ID: 38	Game: numbersStarred	Session: 9	Window: 21	Time: 2018-08-07
12:52:34.300420				
ID: 38	Game: numbersStarred	Session: 9	Window: 22	Time: 2018-08-07
12:52:35.836000				
ID: 38	Game: numbersStarred	Session: 9	Window: 23	Time: 2018-08-07
12:52:38.484630				
ID: 38	Game: numbersStarred	Session: 9	Window: 24	Time: 2018-08-07
12:52:40.399680				
ID: 38	Game: numbersStarred	Session: 9	Window: 25	Time: 2018-08-07
12:52:41.935800				
ID: 38	Game: numbersStarred	Session: 9	Window: 26	Time: 2018-08-07
12:52:43.251110				
ID: 38	Game: numbersStarred	Session: 9	Window: 27	Time: 2018-08-07
12:52:45.717950				
ID: 38	Game: numbersStarred	Session: 9	Window: 28	Time: 2018-08-07
12:52:47.035700				
ID: 38	Game: numbersStarred	Session: 9	Window: 29	Time: 2018-08-07
12:52:49.335110				
ID: 38	Game: numbersStarred	Session: 9	Window: 30	Time: 2018-08-07

12:52:50.951870

ID: 38 Game: numbersStarred Session: 9 Window: 31 Time: 2018-08-07

12:52:53.019120

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 10 Window: 0 Time: 2018-08-07

20:52:51.744690

ID: 38 Game: numbersStarred Session: 10 Window: 1 Time: 2018-08-07

20:52:53.822400

ID: 38 Game: numbersStarred Session: 10 Window: 2 Time: 2018-08-07

20:52:55.673400

ID: 38 Game: numbersStarred Session: 10 Window: 3 Time: 2018-08-07

20:52:57.057880

ID: 38 Game: numbersStarred Session: 10 Window: 4 Time: 2018-08-07

20:52:58.789870

ID: 38 Game: numbersStarred Session: 10 Window: 5 Time: 2018-08-07

20:53:01.140600

ID: 38 Game: numbersStarred Session: 10 Window: 6 Time: 2018-08-07

20:53:02.939490

ID: 38 Game: numbersStarred Session: 10 Window: 7 Time: 2018-08-07

20:53:04.658050

ID: 38 Game: numbersStarred Session: 10 Window: 8 Time: 2018-08-07

20:53:06.083540

ID: 38 Game: numbersStarred Session: 10 Window: 9 Time: 2018-08-07

20:53:18.048410

ID: 38 Game: numbersStarred Session: 10 Window: 10 Time: 2018-08-07

20:53:19.624610

ID: 38 Game: numbersStarred Session: 10 Window: 11 Time: 2018-08-07

20:53:20.725130

ID: 38 Game: numbersStarred Session: 10 Window: 12 Time: 2018-08-07

20:53:22.524440

ID: 38 Game: numbersStarred Session: 10 Window: 13 Time: 2018-08-07

20:53:24.875320

ID: 38 Game: numbersStarred Session: 10 Window: 14 Time: 2018-08-07

20:53:27.124480

ID: 38 Game: numbersStarred Session: 10 Window: 15 Time: 2018-08-07

20:53:29.658450

ID: 38 Game: numbersStarred Session: 10 Window: 16 Time: 2018-08-07

20:53:31.108800

ID: 38 Game: numbersStarred Session: 10 Window: 17 Time: 2018-08-07

20:53:32.375610

ID: 38 Game: numbersStarred Session: 10 Window: 18 Time: 2018-08-07

```

20:53:33.876470
ID: 38 Game: numbersStarred Session: 10 Window: 19 Time: 2018-08-07
20:53:36.509300
ID: 38 Game: numbersStarred Session: 10 Window: 20 Time: 2018-08-07
20:53:38.193080
ID: 38 Game: numbersStarred Session: 10 Window: 21 Time: 2018-08-07
20:53:40.142950
ID: 38 Game: numbersStarred Session: 10 Window: 22 Time: 2018-08-07
20:53:41.742450
ID: 38 Game: numbersStarred Session: 10 Window: 23 Time: 2018-08-07
20:53:45.293840
ID: 38 Game: numbersStarred Session: 10 Window: 24 Time: 2018-08-07
20:53:47.979380
ID: 38 Game: numbersStarred Session: 10 Window: 25 Time: 2018-08-07
20:53:50.327720
ID: 38 Game: numbersStarred Session: 10 Window: 26 Time: 2018-08-07
20:53:51.663420
ID: 38 Game: numbersStarred Session: 10 Window: 27 Time: 2018-08-07
20:53:54.010540
ID: 38 Game: numbersStarred Session: 10 Window: 28 Time: 2018-08-07
20:53:55.909890
ID: 38 Game: numbersStarred Session: 10 Window: 29 Time: 2018-08-07
20:53:58.061820
ID: 38 Game: numbersStarred Session: 10 Window: 30 Time: 2018-08-07
20:54:00.313960
ID: 38 Game: numbersStarred Session: 10 Window: 31 Time: 2018-08-07
20:54:03.312050
ID: 38 Game: numbersStarred Session: 10 Window: 32 Time: 2018-08-07
20:54:05.379600
ID: 38 Game: numbersStarred Session: 10 Window: 33 Time: 2018-08-07
20:54:07.761690
ID: 38 Game: numbersStarred Session: 10 Window: 34 Time: 2018-08-07
20:54:09.461710
ID: 38 Game: numbersStarred Session: 10 Window: 35 Time: 2018-08-07
20:54:11.411820
ID: 38 Game: numbersStarred Session: 10 Window: 36 Time: 2018-08-07
20:54:12.895800
ID: 38 Game: numbersStarred Session: 10 Window: 37 Time: 2018-08-07
20:54:14.462700
ID: 38 Game: numbersStarred Session: 10 Window: 38 Time: 2018-08-07
20:54:16.713190
ID: 38 Game: numbersStarred Session: 10 Window: 39 Time: 2018-08-07
20:54:18.230200
ID: 38 Game: numbersStarred Session: 10 Window: 40 Time: 2018-08-07
20:54:20.463630

```

```

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
RuntimeWarning: Mean of empty slice.

```

```

    out=out, **kwargs)
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
RuntimeWarning: invalid value encountered in double_scalars
    ret = ret.dtype.type(ret / rcount)

```

ID: 38	Game: numbersStarred	Session: 11	Window: 0	Time: 2018-08-08
07:49:42.920740				
ID: 38	Game: numbersStarred	Session: 11	Window: 1	Time: 2018-08-08
07:49:45.231300				
ID: 38	Game: numbersStarred	Session: 11	Window: 2	Time: 2018-08-08
07:49:46.880550				
ID: 38	Game: numbersStarred	Session: 11	Window: 3	Time: 2018-08-08
07:49:48.849700				
ID: 38	Game: numbersStarred	Session: 11	Window: 4	Time: 2018-08-08
07:49:50.780830				
ID: 38	Game: numbersStarred	Session: 11	Window: 5	Time: 2018-08-08
07:49:52.182390				
ID: 38	Game: numbersStarred	Session: 11	Window: 6	Time: 2018-08-08
07:49:53.414470				
ID: 38	Game: numbersStarred	Session: 11	Window: 7	Time: 2018-08-08
07:49:54.632120				
ID: 38	Game: numbersStarred	Session: 11	Window: 8	Time: 2018-08-08
07:49:56.681880				
ID: 38	Game: numbersStarred	Session: 11	Window: 9	Time: 2018-08-08
07:49:58.148940				
ID: 38	Game: numbersStarred	Session: 11	Window: 10	Time: 2018-08-08
07:49:59.966440				
ID: 38	Game: numbersStarred	Session: 11	Window: 11	Time: 2018-08-08
07:50:01.148560				
ID: 38	Game: numbersStarred	Session: 11	Window: 12	Time: 2018-08-08
07:50:02.664980				
ID: 38	Game: numbersStarred	Session: 11	Window: 13	Time: 2018-08-08
07:50:03.866320				
ID: 38	Game: numbersStarred	Session: 11	Window: 14	Time: 2018-08-08
07:50:06.499520				
ID: 38	Game: numbersStarred	Session: 11	Window: 15	Time: 2018-08-08
07:50:08.134820				
ID: 38	Game: numbersStarred	Session: 11	Window: 16	Time: 2018-08-08
07:50:10.318100				
ID: 38	Game: numbersStarred	Session: 11	Window: 17	Time: 2018-08-08
07:50:11.699810				
ID: 38	Game: numbersStarred	Session: 11	Window: 18	Time: 2018-08-08
07:50:13.717000				
ID: 38	Game: numbersStarred	Session: 11	Window: 19	Time: 2018-08-08
07:50:15.533620				
ID: 38	Game: numbersStarred	Session: 11	Window: 20	Time: 2018-08-08
07:50:17.369160				
ID: 38	Game: numbersStarred	Session: 11	Window: 21	Time: 2018-08-08


```

07:50:18.732630
ID: 38 Game: numbersStarred Session: 11 Window: 22 Time: 2018-08-08
07:50:20.935420
ID: 38 Game: numbersStarred Session: 11 Window: 23 Time: 2018-08-08
07:50:22.934040
ID: 38 Game: numbersStarred Session: 11 Window: 24 Time: 2018-08-08
07:50:25.219800
ID: 38 Game: numbersStarred Session: 11 Window: 25 Time: 2018-08-08
07:50:26.917000
ID: 38 Game: numbersStarred Session: 11 Window: 26 Time: 2018-08-08
07:50:29.052590
ID: 38 Game: numbersStarred Session: 11 Window: 27 Time: 2018-08-08
07:50:30.819040
ID: 38 Game: numbersStarred Session: 11 Window: 28 Time: 2018-08-08
07:50:32.736110
ID: 38 Game: numbersStarred Session: 11 Window: 29 Time: 2018-08-08
07:50:35.217240
ID: 38 Game: numbersStarred Session: 11 Window: 30 Time: 2018-08-08
07:50:36.502450
ID: 38 Game: numbersStarred Session: 11 Window: 31 Time: 2018-08-08
07:50:39.368600

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

```

ID: 38 Game: numbersStarred Session: 12 Window: 0 Time: 2018-08-08
21:21:16.180270
ID: 38 Game: numbersStarred Session: 12 Window: 1 Time: 2018-08-08
21:21:17.676690
ID: 38 Game: numbersStarred Session: 12 Window: 2 Time: 2018-08-08
21:21:18.843490
ID: 38 Game: numbersStarred Session: 12 Window: 3 Time: 2018-08-08
21:21:20.776760
ID: 38 Game: numbersStarred Session: 12 Window: 4 Time: 2018-08-08
21:21:22.643200
ID: 38 Game: numbersStarred Session: 12 Window: 5 Time: 2018-08-08
21:21:24.899400
ID: 38 Game: numbersStarred Session: 12 Window: 6 Time: 2018-08-08
21:21:26.943920
ID: 38 Game: numbersStarred Session: 12 Window: 7 Time: 2018-08-08
21:21:29.695020
ID: 38 Game: numbersStarred Session: 12 Window: 8 Time: 2018-08-08
21:21:31.660640
ID: 38 Game: numbersStarred Session: 12 Window: 9 Time: 2018-08-08

```

21:21:33.660840				
ID: 38	Game: numbersStarred	Session: 12	Window: 10	Time: 2018-08-08
21:21:35.562160				
ID: 38	Game: numbersStarred	Session: 12	Window: 11	Time: 2018-08-08
21:21:38.061260				
ID: 38	Game: numbersStarred	Session: 12	Window: 12	Time: 2018-08-08
21:21:39.460810				
ID: 38	Game: numbersStarred	Session: 12	Window: 13	Time: 2018-08-08
21:21:44.345250				
ID: 38	Game: numbersStarred	Session: 12	Window: 14	Time: 2018-08-08
21:21:46.644640				
ID: 38	Game: numbersStarred	Session: 12	Window: 15	Time: 2018-08-08
21:21:49.046310				
ID: 38	Game: numbersStarred	Session: 12	Window: 16	Time: 2018-08-08
21:21:50.546400				
ID: 38	Game: numbersStarred	Session: 12	Window: 17	Time: 2018-08-08
21:21:53.396620				
ID: 38	Game: numbersStarred	Session: 12	Window: 18	Time: 2018-08-08
21:21:55.529600				
ID: 38	Game: numbersStarred	Session: 12	Window: 19	Time: 2018-08-08
21:21:57.498570				
ID: 38	Game: numbersStarred	Session: 12	Window: 20	Time: 2018-08-08
21:21:59.063340				
ID: 38	Game: numbersStarred	Session: 12	Window: 21	Time: 2018-08-08
21:22:00.966010				
ID: 38	Game: numbersStarred	Session: 12	Window: 22	Time: 2018-08-08
21:22:02.596170				
ID: 38	Game: numbersStarred	Session: 12	Window: 23	Time: 2018-08-08
21:22:04.482330				
ID: 38	Game: numbersStarred	Session: 12	Window: 24	Time: 2018-08-08
21:22:11.348800				
ID: 38	Game: numbersStarred	Session: 12	Window: 25	Time: 2018-08-08
21:22:13.480540				
ID: 38	Game: numbersStarred	Session: 12	Window: 26	Time: 2018-08-08
21:22:14.831410				
ID: 38	Game: numbersStarred	Session: 12	Window: 27	Time: 2018-08-08
21:22:16.431830				
ID: 38	Game: numbersStarred	Session: 12	Window: 28	Time: 2018-08-08
21:22:18.763790				
ID: 38	Game: numbersStarred	Session: 12	Window: 29	Time: 2018-08-08
21:22:20.330250				
ID: 38	Game: numbersStarred	Session: 12	Window: 30	Time: 2018-08-08
21:22:22.032620				
ID: 38	Game: numbersStarred	Session: 12	Window: 31	Time: 2018-08-08
21:22:23.799190				
ID: 38	Game: numbersStarred	Session: 12	Window: 32	Time: 2018-08-08
21:22:25.230880				
ID: 38	Game: numbersStarred	Session: 12	Window: 33	Time: 2018-08-08

```

21:22:27.199400
ID: 38 Game: numbersStarred Session: 12 Window: 34 Time: 2018-08-08
21:22:29.350170
ID: 38 Game: numbersStarred Session: 12 Window: 35 Time: 2018-08-08
21:22:31.314630
ID: 38 Game: numbersStarred Session: 12 Window: 36 Time: 2018-08-08
21:22:33.014800
ID: 38 Game: numbersStarred Session: 12 Window: 37 Time: 2018-08-08
21:22:34.382920
ID: 38 Game: numbersStarred Session: 12 Window: 38 Time: 2018-08-08
21:22:35.633220
ID: 38 Game: numbersStarred Session: 12 Window: 39 Time: 2018-08-08
21:22:37.732260
ID: 38 Game: numbersStarred Session: 12 Window: 40 Time: 2018-08-08
21:22:39.732460
ID: 38 Game: numbersStarred Session: 12 Window: 41 Time: 2018-08-08
21:22:40.982620
ID: 38 Game: numbersStarred Session: 12 Window: 42 Time: 2018-08-08
21:22:42.816020
ID: 38 Game: numbersStarred Session: 12 Window: 43 Time: 2018-08-08
21:22:44.699850
ID: 38 Game: numbersStarred Session: 12 Window: 44 Time: 2018-08-08
21:22:46.317150
ID: 38 Game: numbersStarred Session: 12 Window: 45 Time: 2018-08-08
21:22:47.983050
ID: 38 Game: numbersStarred Session: 12 Window: 46 Time: 2018-08-08
21:22:50.234260
ID: 38 Game: numbersStarred Session: 12 Window: 47 Time: 2018-08-08
21:22:52.033110
ID: 38 Game: numbersStarred Session: 12 Window: 48 Time: 2018-08-08
21:22:53.837770
ID: 38 Game: numbersStarred Session: 12 Window: 49 Time: 2018-08-08
21:22:55.966270
ID: 38 Game: numbersStarred Session: 12 Window: 50 Time: 2018-08-08
21:22:57.469080
ID: 38 Game: numbersStarred Session: 12 Window: 51 Time: 2018-08-08
21:23:00.435240
ID: 38 Game: numbersStarred Session: 12 Window: 52 Time: 2018-08-08
21:23:02.551860
ID: 38 Game: numbersStarred Session: 12 Window: 53 Time: 2018-08-08
21:23:06.087020
ID: 38 Game: numbersStarred Session: 12 Window: 54 Time: 2018-08-08
21:23:08.050600
ID: 38 Game: numbersStarred Session: 12 Window: 55 Time: 2018-08-08
21:23:09.970280

```

```

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
RuntimeWarning: Mean of empty slice.

```

```

    out=out, **kwargs)
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
RuntimeWarning: invalid value encountered in double_scalars
    ret = ret.dtype.type(ret / rcount)

```

ID: 38	Game: numbersStarred	Session: 13	Window: 0	Time: 2018-08-09
12:45:55.841180				
ID: 38	Game: numbersStarred	Session: 13	Window: 1	Time: 2018-08-09
12:45:57.862900				
ID: 38	Game: numbersStarred	Session: 13	Window: 2	Time: 2018-08-09
12:46:00.063660				
ID: 38	Game: numbersStarred	Session: 13	Window: 3	Time: 2018-08-09
12:46:01.680950				
ID: 38	Game: numbersStarred	Session: 13	Window: 4	Time: 2018-08-09
12:46:03.796270				
ID: 38	Game: numbersStarred	Session: 13	Window: 5	Time: 2018-08-09
12:46:06.313860				
ID: 38	Game: numbersStarred	Session: 13	Window: 6	Time: 2018-08-09
12:46:08.680990				
ID: 38	Game: numbersStarred	Session: 13	Window: 7	Time: 2018-08-09
12:46:10.746750				
ID: 38	Game: numbersStarred	Session: 13	Window: 8	Time: 2018-08-09
12:46:12.414490				
ID: 38	Game: numbersStarred	Session: 13	Window: 9	Time: 2018-08-09
12:46:14.213870				
ID: 38	Game: numbersStarred	Session: 13	Window: 10	Time: 2018-08-09
12:46:15.964460				
ID: 38	Game: numbersStarred	Session: 13	Window: 11	Time: 2018-08-09
12:46:18.270030				
ID: 38	Game: numbersStarred	Session: 13	Window: 12	Time: 2018-08-09
12:46:20.297720				
ID: 38	Game: numbersStarred	Session: 13	Window: 13	Time: 2018-08-09
12:46:21.932380				
ID: 38	Game: numbersStarred	Session: 13	Window: 14	Time: 2018-08-09
12:46:23.297620				
ID: 38	Game: numbersStarred	Session: 13	Window: 15	Time: 2018-08-09
12:46:25.266660				
ID: 38	Game: numbersStarred	Session: 13	Window: 16	Time: 2018-08-09
12:46:27.132150				
ID: 38	Game: numbersStarred	Session: 13	Window: 17	Time: 2018-08-09
12:46:30.432280				
ID: 38	Game: numbersStarred	Session: 13	Window: 18	Time: 2018-08-09
12:46:32.118160				
ID: 38	Game: numbersStarred	Session: 13	Window: 19	Time: 2018-08-09
12:46:33.482990				
ID: 38	Game: numbersStarred	Session: 13	Window: 20	Time: 2018-08-09
12:46:35.264940				
ID: 38	Game: numbersStarred	Session: 13	Window: 21	Time: 2018-08-09

12:46:37.019040
ID: 38 Game: numbersStarred Session: 13 Window: 22 Time: 2018-08-09
12:46:38.699240
ID: 38 Game: numbersStarred Session: 13 Window: 23 Time: 2018-08-09
12:46:39.865970
ID: 38 Game: numbersStarred Session: 13 Window: 24 Time: 2018-08-09
12:46:41.900380
ID: 38 Game: numbersStarred Session: 13 Window: 25 Time: 2018-08-09
12:46:43.501250
ID: 38 Game: numbersStarred Session: 13 Window: 26 Time: 2018-08-09
12:46:51.604290
ID: 38 Game: numbersStarred Session: 13 Window: 27 Time: 2018-08-09
12:46:55.016780
ID: 38 Game: numbersStarred Session: 13 Window: 28 Time: 2018-08-09
12:46:56.183900
ID: 38 Game: numbersStarred Session: 13 Window: 29 Time: 2018-08-09
12:46:58.083700
ID: 38 Game: numbersStarred Session: 13 Window: 30 Time: 2018-08-09
12:46:59.735200
ID: 38 Game: numbersStarred Session: 13 Window: 31 Time: 2018-08-09
12:47:01.216910
ID: 38 Game: numbersStarred Session: 13 Window: 32 Time: 2018-08-09
12:47:02.568070
ID: 38 Game: numbersStarred Session: 13 Window: 33 Time: 2018-08-09
12:47:04.300020
ID: 38 Game: numbersStarred Session: 13 Window: 34 Time: 2018-08-09
12:47:05.868430
ID: 38 Game: numbersStarred Session: 13 Window: 35 Time: 2018-08-09
12:47:08.484520
ID: 38 Game: numbersStarred Session: 13 Window: 36 Time: 2018-08-09
12:47:10.102450
ID: 38 Game: numbersStarred Session: 13 Window: 37 Time: 2018-08-09
12:47:11.550500
ID: 38 Game: numbersStarred Session: 13 Window: 38 Time: 2018-08-09
12:47:13.119160
ID: 38 Game: numbersStarred Session: 13 Window: 39 Time: 2018-08-09
12:47:15.185420
ID: 38 Game: numbersStarred Session: 13 Window: 40 Time: 2018-08-09
12:47:16.919450
ID: 38 Game: numbersStarred Session: 13 Window: 41 Time: 2018-08-09
12:47:18.935200
ID: 38 Game: numbersStarred Session: 13 Window: 42 Time: 2018-08-09
12:47:20.336500
ID: 38 Game: numbersStarred Session: 13 Window: 43 Time: 2018-08-09
12:47:22.434600
ID: 38 Game: numbersStarred Session: 13 Window: 44 Time: 2018-08-09
12:47:24.653310
ID: 38 Game: numbersStarred Session: 13 Window: 45 Time: 2018-08-09

12:47:26.337320

ID: 38 Game: numbersStarred Session: 13 Window: 46 Time: 2018-08-09

12:47:28.319150

ID: 38 Game: numbersStarred Session: 13 Window: 47 Time: 2018-08-09

12:47:29.735250

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 14 Window: 0 Time: 2018-08-09

20:50:48.075440

ID: 38 Game: numbersStarred Session: 14 Window: 1 Time: 2018-08-09

20:50:50.654950

ID: 38 Game: numbersStarred Session: 14 Window: 2 Time: 2018-08-09

20:50:52.158270

ID: 38 Game: numbersStarred Session: 14 Window: 3 Time: 2018-08-09

20:50:54.371150

ID: 38 Game: numbersStarred Session: 14 Window: 4 Time: 2018-08-09

20:50:56.205070

ID: 38 Game: numbersStarred Session: 14 Window: 5 Time: 2018-08-09

20:50:57.788520

ID: 38 Game: numbersStarred Session: 14 Window: 6 Time: 2018-08-09

20:50:59.771590

ID: 38 Game: numbersStarred Session: 14 Window: 7 Time: 2018-08-09

20:51:02.273080

ID: 38 Game: numbersStarred Session: 14 Window: 8 Time: 2018-08-09

20:51:03.956740

ID: 38 Game: numbersStarred Session: 14 Window: 9 Time: 2018-08-09

20:51:06.671930

ID: 38 Game: numbersStarred Session: 14 Window: 10 Time: 2018-08-09

20:51:08.439190

ID: 38 Game: numbersStarred Session: 14 Window: 11 Time: 2018-08-09

20:51:10.423220

ID: 38 Game: numbersStarred Session: 14 Window: 12 Time: 2018-08-09

20:51:12.340610

ID: 38 Game: numbersStarred Session: 14 Window: 13 Time: 2018-08-09

20:51:14.338920

ID: 38 Game: numbersStarred Session: 14 Window: 14 Time: 2018-08-09

20:51:16.257130

ID: 38 Game: numbersStarred Session: 14 Window: 15 Time: 2018-08-09

20:51:18.439920

ID: 38 Game: numbersStarred Session: 14 Window: 16 Time: 2018-08-09

20:51:20.774970

ID: 38 Game: numbersStarred Session: 14 Window: 17 Time: 2018-08-09

20:51:24.007570
ID: 38 Game: numbersStarred Session: 14 Window: 18 Time: 2018-08-09
20:51:25.756900
ID: 38 Game: numbersStarred Session: 14 Window: 19 Time: 2018-08-09
20:51:29.374700
ID: 38 Game: numbersStarred Session: 14 Window: 20 Time: 2018-08-09
20:51:30.840660
ID: 38 Game: numbersStarred Session: 14 Window: 21 Time: 2018-08-09
20:51:32.424800
ID: 38 Game: numbersStarred Session: 14 Window: 22 Time: 2018-08-09
20:51:33.976050
ID: 38 Game: numbersStarred Session: 14 Window: 23 Time: 2018-08-09
20:51:36.026050
ID: 38 Game: numbersStarred Session: 14 Window: 24 Time: 2018-08-09
20:51:38.274870
ID: 38 Game: numbersStarred Session: 14 Window: 25 Time: 2018-08-09
20:51:40.658900
ID: 38 Game: numbersStarred Session: 14 Window: 26 Time: 2018-08-09
20:51:42.660490
ID: 38 Game: numbersStarred Session: 14 Window: 27 Time: 2018-08-09
20:51:49.364380
ID: 38 Game: numbersStarred Session: 14 Window: 28 Time: 2018-08-09
20:51:51.375430
ID: 38 Game: numbersStarred Session: 14 Window: 29 Time: 2018-08-09
20:51:52.958740
ID: 38 Game: numbersStarred Session: 14 Window: 30 Time: 2018-08-09
20:51:54.592670
ID: 38 Game: numbersStarred Session: 14 Window: 31 Time: 2018-08-09
20:51:56.692290
ID: 38 Game: numbersStarred Session: 14 Window: 32 Time: 2018-08-09
20:51:58.442070
ID: 38 Game: numbersStarred Session: 14 Window: 33 Time: 2018-08-09
20:52:00.658670
ID: 38 Game: numbersStarred Session: 14 Window: 34 Time: 2018-08-09
20:52:02.393150
ID: 38 Game: numbersStarred Session: 14 Window: 35 Time: 2018-08-09
20:52:05.926960
ID: 38 Game: numbersStarred Session: 14 Window: 36 Time: 2018-08-09
20:52:08.093380
ID: 38 Game: numbersStarred Session: 14 Window: 37 Time: 2018-08-09
20:52:10.043360
ID: 38 Game: numbersStarred Session: 14 Window: 38 Time: 2018-08-09
20:52:11.676880
ID: 38 Game: numbersStarred Session: 14 Window: 39 Time: 2018-08-09
20:52:13.644670
ID: 38 Game: numbersStarred Session: 14 Window: 40 Time: 2018-08-09
20:52:15.643610
ID: 38 Game: numbersStarred Session: 14 Window: 41 Time: 2018-08-09

```

20:52:18.060130
ID: 38 Game: numbersStarred Session: 14 Window: 42 Time: 2018-08-09
20:52:19.844000
ID: 38 Game: numbersStarred Session: 14 Window: 43 Time: 2018-08-09
20:52:22.277770
ID: 38 Game: numbersStarred Session: 14 Window: 44 Time: 2018-08-09
20:52:23.927820
ID: 38 Game: numbersStarred Session: 14 Window: 45 Time: 2018-08-09
20:52:25.960840
ID: 38 Game: numbersStarred Session: 14 Window: 46 Time: 2018-08-09
20:52:27.476710
ID: 38 Game: numbersStarred Session: 14 Window: 47 Time: 2018-08-09
20:52:29.495650
ID: 38 Game: numbersStarred Session: 14 Window: 48 Time: 2018-08-09
20:52:31.777270
ID: 38 Game: numbersStarred Session: 14 Window: 49 Time: 2018-08-09
20:52:35.161680
ID: 38 Game: numbersStarred Session: 14 Window: 50 Time: 2018-08-09
20:52:36.761860
ID: 38 Game: numbersStarred Session: 14 Window: 51 Time: 2018-08-09
20:52:38.911940
ID: 38 Game: numbersStarred Session: 14 Window: 52 Time: 2018-08-09
20:52:41.196200

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

```

ID: 38 Game: numbersStarred Session: 15 Window: 0 Time: 2018-08-10
08:18:05.250830
ID: 38 Game: numbersStarred Session: 15 Window: 1 Time: 2018-08-10
08:18:07.010690
ID: 38 Game: numbersStarred Session: 15 Window: 2 Time: 2018-08-10
08:18:08.328490
ID: 38 Game: numbersStarred Session: 15 Window: 3 Time: 2018-08-10
08:18:09.893700
ID: 38 Game: numbersStarred Session: 15 Window: 4 Time: 2018-08-10
08:18:12.194930
ID: 38 Game: numbersStarred Session: 15 Window: 5 Time: 2018-08-10
08:18:13.762100
ID: 38 Game: numbersStarred Session: 15 Window: 6 Time: 2018-08-10
08:18:15.994630
ID: 38 Game: numbersStarred Session: 15 Window: 7 Time: 2018-08-10
08:18:17.329060
ID: 38 Game: numbersStarred Session: 15 Window: 8 Time: 2018-08-10

```


08:18:19.145510				
ID: 38	Game: numbersStarred	Session: 15	Window: 9	Time: 2018-08-10
08:18:22.361970				
ID: 38	Game: numbersStarred	Session: 15	Window: 10	Time: 2018-08-10
08:18:23.813300				
ID: 38	Game: numbersStarred	Session: 15	Window: 11	Time: 2018-08-10
08:18:25.512250				
ID: 38	Game: numbersStarred	Session: 15	Window: 12	Time: 2018-08-10
08:18:27.980110				
ID: 38	Game: numbersStarred	Session: 15	Window: 13	Time: 2018-08-10
08:18:29.712720				
ID: 38	Game: numbersStarred	Session: 15	Window: 14	Time: 2018-08-10
08:18:32.012590				
ID: 38	Game: numbersStarred	Session: 15	Window: 15	Time: 2018-08-10
08:18:33.730000				
ID: 38	Game: numbersStarred	Session: 15	Window: 16	Time: 2018-08-10
08:18:35.895470				
ID: 38	Game: numbersStarred	Session: 15	Window: 17	Time: 2018-08-10
08:18:37.633890				
ID: 38	Game: numbersStarred	Session: 15	Window: 18	Time: 2018-08-10
08:18:40.146600				
ID: 38	Game: numbersStarred	Session: 15	Window: 19	Time: 2018-08-10
08:18:41.963540				
ID: 38	Game: numbersStarred	Session: 15	Window: 20	Time: 2018-08-10
08:18:43.649980				
ID: 38	Game: numbersStarred	Session: 15	Window: 21	Time: 2018-08-10
08:18:45.663290				
ID: 38	Game: numbersStarred	Session: 15	Window: 22	Time: 2018-08-10
08:18:47.433210				
ID: 38	Game: numbersStarred	Session: 15	Window: 23	Time: 2018-08-10
08:18:49.714700				
ID: 38	Game: numbersStarred	Session: 15	Window: 24	Time: 2018-08-10
08:18:51.514840				
ID: 38	Game: numbersStarred	Session: 15	Window: 25	Time: 2018-08-10
08:18:52.980070				
ID: 38	Game: numbersStarred	Session: 15	Window: 26	Time: 2018-08-10
08:18:56.098320				
ID: 38	Game: numbersStarred	Session: 15	Window: 27	Time: 2018-08-10
08:18:58.882830				
ID: 38	Game: numbersStarred	Session: 15	Window: 28	Time: 2018-08-10
08:19:00.667490				
ID: 38	Game: numbersStarred	Session: 15	Window: 29	Time: 2018-08-10
08:19:03.365150				
ID: 38	Game: numbersStarred	Session: 15	Window: 30	Time: 2018-08-10
08:19:05.249610				
ID: 38	Game: numbersStarred	Session: 15	Window: 31	Time: 2018-08-10
08:19:06.948960				

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
RuntimeWarning: Mean of empty slice.
    out=out, **kwargs)
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
RuntimeWarning: invalid value encountered in double_scalars
    ret = ret.dtype.type(ret / rcount)
```

ID: 38	Game: numbersStarred	Session: 18	Window: 0	Time: 2018-08-10
21:43:51.743560				
ID: 38	Game: numbersStarred	Session: 18	Window: 1	Time: 2018-08-10
21:44:00.692950				
ID: 38	Game: numbersStarred	Session: 18	Window: 2	Time: 2018-08-10
21:44:06.260190				
ID: 38	Game: numbersStarred	Session: 18	Window: 3	Time: 2018-08-10
21:44:11.546280				
ID: 38	Game: numbersStarred	Session: 18	Window: 4	Time: 2018-08-10
21:44:20.197330				
ID: 38	Game: numbersStarred	Session: 18	Window: 5	Time: 2018-08-10
21:44:22.129000				
ID: 38	Game: numbersStarred	Session: 18	Window: 6	Time: 2018-08-10
21:44:24.096800				
ID: 38	Game: numbersStarred	Session: 18	Window: 7	Time: 2018-08-10
21:44:46.247580				
ID: 38	Game: numbersStarred	Session: 18	Window: 8	Time: 2018-08-10
21:44:48.112490				

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
RuntimeWarning: Mean of empty slice.
    out=out, **kwargs)
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
RuntimeWarning: invalid value encountered in double_scalars
    ret = ret.dtype.type(ret / rcount)
```

ID: 38	Game: numbersStarred	Session: 19	Window: 0	Time: 2019-02-11
09:06:31.576246				
ID: 38	Game: numbersStarred	Session: 19	Window: 1	Time: 2019-02-11
09:06:34.506265				
ID: 38	Game: numbersStarred	Session: 19	Window: 2	Time: 2019-02-11
09:06:36.589748				
ID: 38	Game: numbersStarred	Session: 19	Window: 3	Time: 2019-02-11
09:06:39.790014				
ID: 38	Game: numbersStarred	Session: 19	Window: 4	Time: 2019-02-11
09:06:43.740298				
ID: 38	Game: numbersStarred	Session: 19	Window: 5	Time: 2019-02-11
09:06:46.440482				
ID: 38	Game: numbersStarred	Session: 19	Window: 6	Time: 2019-02-11
09:06:59.563592				
ID: 38	Game: numbersStarred	Session: 19	Window: 7	Time: 2019-02-11

09:07:01.074828
ID: 38 Game: numbersStarred Session: 19 Window: 8 Time: 2019-02-11
09:07:03.958395
ID: 38 Game: numbersStarred Session: 19 Window: 9 Time: 2019-02-11
09:07:06.108560
ID: 38 Game: numbersStarred Session: 19 Window: 10 Time: 2019-02-11
09:07:07.125335
ID: 38 Game: numbersStarred Session: 19 Window: 11 Time: 2019-02-11
09:07:08.725409
ID: 38 Game: numbersStarred Session: 19 Window: 12 Time: 2019-02-11
09:07:10.625563
ID: 38 Game: numbersStarred Session: 19 Window: 13 Time: 2019-02-11
09:07:14.675837
ID: 38 Game: numbersStarred Session: 19 Window: 14 Time: 2019-02-11
09:07:16.826064
ID: 38 Game: numbersStarred Session: 19 Window: 15 Time: 2019-02-11
09:07:19.042834
ID: 38 Game: numbersStarred Session: 19 Window: 16 Time: 2019-02-11
09:07:20.742939
ID: 38 Game: numbersStarred Session: 19 Window: 17 Time: 2019-02-11
09:07:22.659720
ID: 38 Game: numbersStarred Session: 19 Window: 18 Time: 2019-02-11
09:07:24.159832
ID: 38 Game: numbersStarred Session: 19 Window: 19 Time: 2019-02-11
09:07:26.476706
ID: 38 Game: numbersStarred Session: 19 Window: 20 Time: 2019-02-11
09:07:30.543619
ID: 38 Game: numbersStarred Session: 19 Window: 21 Time: 2019-02-11
09:07:32.460525
ID: 38 Game: numbersStarred Session: 19 Window: 22 Time: 2019-02-11
09:07:34.727250
ID: 38 Game: numbersStarred Session: 19 Window: 23 Time: 2019-02-11
09:07:36.927459
ID: 38 Game: numbersStarred Session: 19 Window: 24 Time: 2019-02-11
09:07:38.762586
ID: 38 Game: numbersStarred Session: 19 Window: 25 Time: 2019-02-11
09:07:40.961132
ID: 38 Game: numbersStarred Session: 19 Window: 26 Time: 2019-02-11
09:07:42.461194
ID: 38 Game: numbersStarred Session: 19 Window: 27 Time: 2019-02-11
09:07:44.011265
ID: 38 Game: numbersStarred Session: 19 Window: 28 Time: 2019-02-11
09:07:46.094752
ID: 38 Game: numbersStarred Session: 19 Window: 29 Time: 2019-02-11
09:07:49.428393
ID: 38 Game: numbersStarred Session: 19 Window: 30 Time: 2019-02-11
09:07:51.361847
ID: 38 Game: numbersStarred Session: 19 Window: 31 Time: 2019-02-11

```

09:07:52.995240
ID: 38 Game: numbersStarred Session: 19 Window: 32 Time: 2019-02-11
09:07:54.878760
ID: 38 Game: numbersStarred Session: 19 Window: 33 Time: 2019-02-11
09:07:56.728842
ID: 38 Game: numbersStarred Session: 19 Window: 34 Time: 2019-02-11
09:07:59.930545
ID: 38 Game: numbersStarred Session: 19 Window: 35 Time: 2019-02-11
09:08:02.479263
ID: 38 Game: numbersStarred Session: 19 Window: 36 Time: 2019-02-11
09:08:04.262767
ID: 38 Game: numbersStarred Session: 19 Window: 37 Time: 2019-02-11
09:08:06.862928

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

```

ID: 38 Game: numbersStarred Session: 20 Window: 0 Time: 2019-02-11
13:06:03.171651
ID: 38 Game: numbersStarred Session: 20 Window: 1 Time: 2019-02-11
13:06:04.535899
ID: 38 Game: numbersStarred Session: 20 Window: 2 Time: 2019-02-11
13:06:06.903655
ID: 38 Game: numbersStarred Session: 20 Window: 3 Time: 2019-02-11
13:06:08.369392
ID: 38 Game: numbersStarred Session: 20 Window: 4 Time: 2019-02-11
13:06:10.302979
ID: 38 Game: numbersStarred Session: 20 Window: 5 Time: 2019-02-11
13:06:12.236375
ID: 38 Game: numbersStarred Session: 20 Window: 6 Time: 2019-02-11
13:06:14.503201
ID: 38 Game: numbersStarred Session: 20 Window: 7 Time: 2019-02-11
13:06:16.103331
ID: 38 Game: numbersStarred Session: 20 Window: 8 Time: 2019-02-11
13:06:17.953474
ID: 38 Game: numbersStarred Session: 20 Window: 9 Time: 2019-02-11
13:06:19.603495
ID: 38 Game: numbersStarred Session: 20 Window: 10 Time: 2019-02-11
13:06:21.403630
ID: 38 Game: numbersStarred Session: 20 Window: 11 Time: 2019-02-11
13:06:23.087102
ID: 38 Game: numbersStarred Session: 20 Window: 12 Time: 2019-02-11
13:06:26.220633
ID: 38 Game: numbersStarred Session: 20 Window: 13 Time: 2019-02-11

```

13:06:27.887392				
ID: 38	Game: numbersStarred	Session: 20	Window: 14	Time: 2019-02-11
13:06:29.137485				
ID: 38	Game: numbersStarred	Session: 20	Window: 15	Time: 2019-02-11
13:06:38.577968				
ID: 38	Game: numbersStarred	Session: 20	Window: 16	Time: 2019-02-11
13:06:40.038313				
ID: 38	Game: numbersStarred	Session: 20	Window: 17	Time: 2019-02-11
13:06:41.605029				
ID: 38	Game: numbersStarred	Session: 20	Window: 18	Time: 2019-02-11
13:06:42.971802				
ID: 38	Game: numbersStarred	Session: 20	Window: 19	Time: 2019-02-11
13:06:44.405212				
ID: 38	Game: numbersStarred	Session: 20	Window: 20	Time: 2019-02-11
13:06:46.422032				
ID: 38	Game: numbersStarred	Session: 20	Window: 21	Time: 2019-02-11
13:06:48.122208				
ID: 38	Game: numbersStarred	Session: 20	Window: 22	Time: 2019-02-11
13:06:49.905619				
ID: 38	Game: numbersStarred	Session: 20	Window: 23	Time: 2019-02-11
13:06:51.922394				
ID: 38	Game: numbersStarred	Session: 20	Window: 24	Time: 2019-02-11
13:06:53.655860				
ID: 38	Game: numbersStarred	Session: 20	Window: 25	Time: 2019-02-11
13:06:55.206014				
ID: 38	Game: numbersStarred	Session: 20	Window: 26	Time: 2019-02-11
13:06:56.972766				
ID: 38	Game: numbersStarred	Session: 20	Window: 27	Time: 2019-02-11
13:06:58.672948				
ID: 38	Game: numbersStarred	Session: 20	Window: 28	Time: 2019-02-11
13:07:00.573228				
ID: 38	Game: numbersStarred	Session: 20	Window: 29	Time: 2019-02-11
13:07:02.256511				
ID: 38	Game: numbersStarred	Session: 20	Window: 30	Time: 2019-02-11
13:07:03.839990				
ID: 38	Game: numbersStarred	Session: 20	Window: 31	Time: 2019-02-11
13:07:05.456711				
ID: 38	Game: numbersStarred	Session: 20	Window: 32	Time: 2019-02-11
13:07:07.823539				
ID: 38	Game: numbersStarred	Session: 20	Window: 33	Time: 2019-02-11
13:07:09.740330				
ID: 38	Game: numbersStarred	Session: 20	Window: 34	Time: 2019-02-11
13:07:11.207080				
ID: 38	Game: numbersStarred	Session: 20	Window: 35	Time: 2019-02-11
13:07:13.157246				
ID: 38	Game: numbersStarred	Session: 20	Window: 36	Time: 2019-02-11
13:07:14.924048				
ID: 38	Game: numbersStarred	Session: 20	Window: 37	Time: 2019-02-11

```

13:07:16.324195
ID: 38 Game: numbersStarred Session: 20 Window: 38 Time: 2019-02-11
13:07:19.541009
ID: 38 Game: numbersStarred Session: 20 Window: 39 Time: 2019-02-11
13:07:22.057876
ID: 38 Game: numbersStarred Session: 20 Window: 40 Time: 2019-02-11
13:07:24.691430
ID: 38 Game: numbersStarred Session: 20 Window: 41 Time: 2019-02-11
13:07:27.124923
ID: 38 Game: numbersStarred Session: 20 Window: 42 Time: 2019-02-11
13:07:29.225002
ID: 38 Game: numbersStarred Session: 20 Window: 43 Time: 2019-02-11
13:07:31.091859
ID: 38 Game: numbersStarred Session: 20 Window: 44 Time: 2019-02-11
13:07:32.458619
ID: 38 Game: numbersStarred Session: 20 Window: 45 Time: 2019-02-11
13:07:34.492220
ID: 38 Game: numbersStarred Session: 20 Window: 46 Time: 2019-02-11
13:07:36.575595

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

```

ID: 38 Game: numbersStarred Session: 21 Window: 0 Time: 2019-02-12
09:11:40.503680
ID: 38 Game: numbersStarred Session: 21 Window: 1 Time: 2019-02-12
09:11:42.115659
ID: 38 Game: numbersStarred Session: 21 Window: 2 Time: 2019-02-12
09:11:43.415765
ID: 38 Game: numbersStarred Session: 21 Window: 3 Time: 2019-02-12
09:11:45.565881
ID: 38 Game: numbersStarred Session: 21 Window: 4 Time: 2019-02-12
09:11:48.099390
ID: 38 Game: numbersStarred Session: 21 Window: 5 Time: 2019-02-12
09:11:49.832921
ID: 38 Game: numbersStarred Session: 21 Window: 6 Time: 2019-02-12
09:11:51.633048
ID: 38 Game: numbersStarred Session: 21 Window: 7 Time: 2019-02-12
09:11:53.183108
ID: 38 Game: numbersStarred Session: 21 Window: 8 Time: 2019-02-12
09:11:55.716672
ID: 38 Game: numbersStarred Session: 21 Window: 9 Time: 2019-02-12
09:11:57.466753
ID: 38 Game: numbersStarred Session: 21 Window: 10 Time: 2019-02-12

```

```

09:11:59.633641
ID: 38 Game: numbersStarred Session: 21 Window: 11 Time: 2019-02-12
09:12:01.233670
ID: 38 Game: numbersStarred Session: 21 Window: 12 Time: 2019-02-12
09:12:02.333746
ID: 38 Game: numbersStarred Session: 21 Window: 13 Time: 2019-02-12
09:12:04.067209
ID: 38 Game: numbersStarred Session: 21 Window: 14 Time: 2019-02-12
09:12:05.800680
ID: 38 Game: numbersStarred Session: 21 Window: 15 Time: 2019-02-12
09:12:07.417434
ID: 38 Game: numbersStarred Session: 21 Window: 16 Time: 2019-02-12
09:12:08.750887
ID: 38 Game: numbersStarred Session: 21 Window: 17 Time: 2019-02-12
09:12:10.067749
ID: 38 Game: numbersStarred Session: 21 Window: 18 Time: 2019-02-12
09:12:11.784450
ID: 38 Game: numbersStarred Session: 21 Window: 19 Time: 2019-02-12
09:12:14.151279
ID: 38 Game: numbersStarred Session: 21 Window: 20 Time: 2019-02-12
09:12:15.901400
ID: 38 Game: numbersStarred Session: 21 Window: 21 Time: 2019-02-12
09:12:17.218173
ID: 38 Game: numbersStarred Session: 21 Window: 22 Time: 2019-02-12
09:12:19.201688
ID: 38 Game: numbersStarred Session: 21 Window: 23 Time: 2019-02-12
09:12:20.901875
ID: 38 Game: numbersStarred Session: 21 Window: 24 Time: 2019-02-12
09:12:23.418618
ID: 38 Game: numbersStarred Session: 21 Window: 25 Time: 2019-02-12
09:12:25.718785
ID: 38 Game: numbersStarred Session: 21 Window: 26 Time: 2019-02-12
09:12:27.368945
ID: 38 Game: numbersStarred Session: 21 Window: 27 Time: 2019-02-12
09:12:29.569182
ID: 38 Game: numbersStarred Session: 21 Window: 28 Time: 2019-02-12
09:12:31.135858

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

```

ID: 38 Game: numbersStarred Session: 22 Window: 0 Time: 2019-02-12
13:06:47.494517

```

```
ID: 38 Game: numbersStarred Session: 22 Window: 1 Time: 2019-02-12
```

13:06:48.972029
ID: 38 Game: numbersStarred Session: 22 Window: 2 Time: 2019-02-12
13:06:50.438786
ID: 38 Game: numbersStarred Session: 22 Window: 3 Time: 2019-02-12
13:06:51.738774
ID: 38 Game: numbersStarred Session: 22 Window: 4 Time: 2019-02-12
13:06:53.488925
ID: 38 Game: numbersStarred Session: 22 Window: 5 Time: 2019-02-12
13:06:55.805686
ID: 38 Game: numbersStarred Session: 22 Window: 6 Time: 2019-02-12
13:06:58.072456
ID: 38 Game: numbersStarred Session: 22 Window: 7 Time: 2019-02-12
13:07:00.789250
ID: 38 Game: numbersStarred Session: 22 Window: 8 Time: 2019-02-12
13:07:02.439361
ID: 38 Game: numbersStarred Session: 22 Window: 9 Time: 2019-02-12
13:07:05.289477
ID: 38 Game: numbersStarred Session: 22 Window: 10 Time: 2019-02-12
13:07:07.272944
ID: 38 Game: numbersStarred Session: 22 Window: 11 Time: 2019-02-12
13:07:08.456350
ID: 38 Game: numbersStarred Session: 22 Window: 12 Time: 2019-02-12
13:07:10.506447
ID: 38 Game: numbersStarred Session: 22 Window: 13 Time: 2019-02-12
13:07:12.273219
ID: 38 Game: numbersStarred Session: 22 Window: 14 Time: 2019-02-12
13:07:13.773387
ID: 38 Game: numbersStarred Session: 22 Window: 15 Time: 2019-02-12
13:07:15.656781
ID: 38 Game: numbersStarred Session: 22 Window: 16 Time: 2019-02-12
13:07:17.123537
ID: 38 Game: numbersStarred Session: 22 Window: 17 Time: 2019-02-12
13:07:18.940344
ID: 38 Game: numbersStarred Session: 22 Window: 18 Time: 2019-02-12
13:07:20.990469
ID: 38 Game: numbersStarred Session: 22 Window: 19 Time: 2019-02-12
13:07:23.340571
ID: 38 Game: numbersStarred Session: 22 Window: 20 Time: 2019-02-12
13:07:26.057402
ID: 38 Game: numbersStarred Session: 22 Window: 21 Time: 2019-02-12
13:07:27.857570
ID: 38 Game: numbersStarred Session: 22 Window: 22 Time: 2019-02-12
13:07:29.207662
ID: 38 Game: numbersStarred Session: 22 Window: 23 Time: 2019-02-12
13:07:30.441006
ID: 38 Game: numbersStarred Session: 22 Window: 24 Time: 2019-02-12
13:07:32.591212
ID: 38 Game: numbersStarred Session: 22 Window: 25 Time: 2019-02-12


```

13:07:34.224631
ID: 38 Game: numbersStarred Session: 22 Window: 26 Time: 2019-02-12
13:07:36.641435
ID: 38 Game: numbersStarred Session: 22 Window: 27 Time: 2019-02-12
13:07:37.924925
ID: 38 Game: numbersStarred Session: 22 Window: 28 Time: 2019-02-12
13:07:39.858314
ID: 38 Game: numbersStarred Session: 22 Window: 29 Time: 2019-02-12
13:07:42.058510
ID: 38 Game: numbersStarred Session: 22 Window: 30 Time: 2019-02-12
13:07:44.125294
ID: 38 Game: numbersStarred Session: 22 Window: 31 Time: 2019-02-12
13:07:45.508725

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

```

ID: 38 Game: numbersStarred Session: 23 Window: 0 Time: 2019-02-12
22:36:15.031583
ID: 38 Game: numbersStarred Session: 23 Window: 1 Time: 2019-02-12
22:36:16.743994
ID: 38 Game: numbersStarred Session: 23 Window: 2 Time: 2019-02-12
22:36:18.744169
ID: 38 Game: numbersStarred Session: 23 Window: 3 Time: 2019-02-12
22:36:21.177758
ID: 38 Game: numbersStarred Session: 23 Window: 4 Time: 2019-02-12
22:36:22.827770
ID: 38 Game: numbersStarred Session: 23 Window: 5 Time: 2019-02-12
22:36:24.327893
ID: 38 Game: numbersStarred Session: 23 Window: 6 Time: 2019-02-12
22:36:25.561303
ID: 38 Game: numbersStarred Session: 23 Window: 7 Time: 2019-02-12
22:36:26.811405
ID: 38 Game: numbersStarred Session: 23 Window: 8 Time: 2019-02-12
22:36:29.178274
ID: 38 Game: numbersStarred Session: 23 Window: 9 Time: 2019-02-12
22:36:30.745138
ID: 38 Game: numbersStarred Session: 23 Window: 10 Time: 2019-02-12
22:36:32.478589
ID: 38 Game: numbersStarred Session: 23 Window: 11 Time: 2019-02-12
22:36:34.011955
ID: 38 Game: numbersStarred Session: 23 Window: 12 Time: 2019-02-12
22:36:35.695441
ID: 38 Game: numbersStarred Session: 23 Window: 13 Time: 2019-02-12

```

22:36:37.578920
ID: 38 Game: numbersStarred Session: 23 Window: 14 Time: 2019-02-12
22:36:39.595728
ID: 38 Game: numbersStarred Session: 23 Window: 15 Time: 2019-02-12
22:36:41.412593
ID: 38 Game: numbersStarred Session: 23 Window: 16 Time: 2019-02-12
22:36:43.029288
ID: 38 Game: numbersStarred Session: 23 Window: 17 Time: 2019-02-12
22:36:45.029459
ID: 38 Game: numbersStarred Session: 23 Window: 18 Time: 2019-02-12
22:36:47.179604
ID: 38 Game: numbersStarred Session: 23 Window: 19 Time: 2019-02-12
22:36:48.696352
ID: 38 Game: numbersStarred Session: 23 Window: 20 Time: 2019-02-12
22:36:50.629900
ID: 38 Game: numbersStarred Session: 23 Window: 21 Time: 2019-02-12
22:36:51.996618
ID: 38 Game: numbersStarred Session: 23 Window: 22 Time: 2019-02-12
22:36:53.913419
ID: 38 Game: numbersStarred Session: 23 Window: 23 Time: 2019-02-12
22:36:56.413579
ID: 38 Game: numbersStarred Session: 23 Window: 24 Time: 2019-02-12
22:36:58.197150
ID: 38 Game: numbersStarred Session: 23 Window: 25 Time: 2019-02-12
22:37:00.063910
ID: 38 Game: numbersStarred Session: 23 Window: 26 Time: 2019-02-12
22:37:03.047418
ID: 38 Game: numbersStarred Session: 23 Window: 27 Time: 2019-02-12
22:37:05.064272
ID: 38 Game: numbersStarred Session: 23 Window: 28 Time: 2019-02-12
22:37:07.631153
ID: 38 Game: numbersStarred Session: 23 Window: 29 Time: 2019-02-12
22:37:09.531300
ID: 38 Game: numbersStarred Session: 23 Window: 30 Time: 2019-02-12
22:37:11.514740
ID: 38 Game: numbersStarred Session: 23 Window: 31 Time: 2019-02-12
22:37:13.164845

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 24 Window: 0 Time: 2019-02-13
13:07:37.138743

ID: 38 Game: numbersStarred Session: 24 Window: 1 Time: 2019-02-13

13:07:38.722306				
ID: 38	Game: numbersStarred	Session: 24	Window: 2	Time: 2019-02-13
13:07:40.055655				
ID: 38	Game: numbersStarred	Session: 24	Window: 3	Time: 2019-02-13
13:07:42.189114				
ID: 38	Game: numbersStarred	Session: 24	Window: 4	Time: 2019-02-13
13:07:43.855911				
ID: 38	Game: numbersStarred	Session: 24	Window: 5	Time: 2019-02-13
13:07:45.872759				
ID: 38	Game: numbersStarred	Session: 24	Window: 6	Time: 2019-02-13
13:07:47.856254				
ID: 38	Game: numbersStarred	Session: 24	Window: 7	Time: 2019-02-13
13:07:49.239648				
ID: 38	Game: numbersStarred	Session: 24	Window: 8	Time: 2019-02-13
13:07:51.223187				
ID: 38	Game: numbersStarred	Session: 24	Window: 9	Time: 2019-02-13
13:07:53.539971				
ID: 38	Game: numbersStarred	Session: 24	Window: 10	Time: 2019-02-13
13:07:55.240084				
ID: 38	Game: numbersStarred	Session: 24	Window: 11	Time: 2019-02-13
13:07:56.956898				
ID: 38	Game: numbersStarred	Session: 24	Window: 12	Time: 2019-02-13
13:07:58.390325				
ID: 38	Game: numbersStarred	Session: 24	Window: 13	Time: 2019-02-13
13:08:00.173771				
ID: 38	Game: numbersStarred	Session: 24	Window: 14	Time: 2019-02-13
13:08:01.957208				
ID: 38	Game: numbersStarred	Session: 24	Window: 15	Time: 2019-02-13
13:08:04.440769				
ID: 38	Game: numbersStarred	Session: 24	Window: 16	Time: 2019-02-13
13:08:06.140885				
ID: 38	Game: numbersStarred	Session: 24	Window: 17	Time: 2019-02-13
13:08:07.791062				
ID: 38	Game: numbersStarred	Session: 24	Window: 18	Time: 2019-02-13
13:08:10.524728				
ID: 38	Game: numbersStarred	Session: 24	Window: 19	Time: 2019-02-13
13:08:12.324712				
ID: 38	Game: numbersStarred	Session: 24	Window: 20	Time: 2019-02-13
13:08:14.241494				
ID: 38	Game: numbersStarred	Session: 24	Window: 21	Time: 2019-02-13
13:08:16.191720				
ID: 38	Game: numbersStarred	Session: 24	Window: 22	Time: 2019-02-13
13:08:19.641886				
ID: 38	Game: numbersStarred	Session: 24	Window: 23	Time: 2019-02-13
13:08:22.025438				
ID: 38	Game: numbersStarred	Session: 24	Window: 24	Time: 2019-02-13
13:08:23.592167				
ID: 38	Game: numbersStarred	Session: 24	Window: 25	Time: 2019-02-13

```

13:08:25.475602
ID: 38 Game: numbersStarred Session: 24 Window: 26 Time: 2019-02-13
13:08:27.109061
ID: 38 Game: numbersStarred Session: 24 Window: 27 Time: 2019-02-13
13:08:29.092532
ID: 38 Game: numbersStarred Session: 24 Window: 28 Time: 2019-02-13
13:08:31.276076
ID: 38 Game: numbersStarred Session: 24 Window: 29 Time: 2019-02-13
13:08:33.342902
ID: 38 Game: numbersStarred Session: 24 Window: 30 Time: 2019-02-13
13:08:35.559836
ID: 38 Game: numbersStarred Session: 24 Window: 31 Time: 2019-02-13
13:08:37.459929

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

```

ID: 38 Game: numbersStarred Session: 25 Window: 0 Time: 2019-02-13
21:34:02.131384
ID: 38 Game: numbersStarred Session: 25 Window: 1 Time: 2019-02-13
21:34:03.498243
ID: 38 Game: numbersStarred Session: 25 Window: 2 Time: 2019-02-13
21:34:05.014908
ID: 38 Game: numbersStarred Session: 25 Window: 3 Time: 2019-02-13
21:34:06.948363
ID: 38 Game: numbersStarred Session: 25 Window: 4 Time: 2019-02-13
21:34:08.931790
ID: 38 Game: numbersStarred Session: 25 Window: 5 Time: 2019-02-13
21:34:10.515227
ID: 38 Game: numbersStarred Session: 25 Window: 6 Time: 2019-02-13
21:34:11.765352
ID: 38 Game: numbersStarred Session: 25 Window: 7 Time: 2019-02-13
21:34:13.148716
ID: 38 Game: numbersStarred Session: 25 Window: 8 Time: 2019-02-13
21:34:15.515557
ID: 38 Game: numbersStarred Session: 25 Window: 9 Time: 2019-02-13
21:34:17.332367
ID: 38 Game: numbersStarred Session: 25 Window: 10 Time: 2019-02-13
21:34:18.932488
ID: 38 Game: numbersStarred Session: 25 Window: 11 Time: 2019-02-13
21:34:21.982692
ID: 38 Game: numbersStarred Session: 25 Window: 12 Time: 2019-02-13
21:34:23.749505
ID: 38 Game: numbersStarred Session: 25 Window: 13 Time: 2019-02-13

```

21:34:25.216263
ID: 38 Game: numbersStarred Session: 25 Window: 14 Time: 2019-02-13
21:34:26.866567
ID: 38 Game: numbersStarred Session: 25 Window: 15 Time: 2019-02-13
21:34:28.633226
ID: 38 Game: numbersStarred Session: 25 Window: 16 Time: 2019-02-13
21:34:30.666664
ID: 38 Game: numbersStarred Session: 25 Window: 17 Time: 2019-02-13
21:34:32.300112
ID: 38 Game: numbersStarred Session: 25 Window: 18 Time: 2019-02-13
21:34:33.800260
ID: 38 Game: numbersStarred Session: 25 Window: 19 Time: 2019-02-13
21:34:35.533658
ID: 38 Game: numbersStarred Session: 25 Window: 20 Time: 2019-02-13
21:34:37.267147
ID: 38 Game: numbersStarred Session: 25 Window: 21 Time: 2019-02-13
21:34:38.984044
ID: 38 Game: numbersStarred Session: 25 Window: 22 Time: 2019-02-13
21:34:41.750740
ID: 38 Game: numbersStarred Session: 25 Window: 23 Time: 2019-02-13
21:34:43.317491
ID: 38 Game: numbersStarred Session: 25 Window: 24 Time: 2019-02-13
21:34:44.734315
ID: 38 Game: numbersStarred Session: 25 Window: 25 Time: 2019-02-13
21:34:45.984453
ID: 38 Game: numbersStarred Session: 25 Window: 26 Time: 2019-02-13
21:34:48.001215
ID: 38 Game: numbersStarred Session: 25 Window: 27 Time: 2019-02-13
21:34:49.768040
ID: 38 Game: numbersStarred Session: 25 Window: 28 Time: 2019-02-13
21:34:53.668286
ID: 38 Game: numbersStarred Session: 25 Window: 29 Time: 2019-02-13
21:34:55.401706
ID: 38 Game: numbersStarred Session: 25 Window: 30 Time: 2019-02-13
21:34:57.551899
ID: 38 Game: numbersStarred Session: 25 Window: 31 Time: 2019-02-13
21:35:08.454878
ID: 38 Game: numbersStarred Session: 25 Window: 32 Time: 2019-02-13
21:35:09.836112
ID: 38 Game: numbersStarred Session: 25 Window: 33 Time: 2019-02-13
21:35:10.936135
ID: 38 Game: numbersStarred Session: 25 Window: 34 Time: 2019-02-13
21:35:12.819623
ID: 38 Game: numbersStarred Session: 25 Window: 35 Time: 2019-02-13
21:35:14.703057
ID: 38 Game: numbersStarred Session: 25 Window: 36 Time: 2019-02-13
21:35:16.686546
ID: 38 Game: numbersStarred Session: 25 Window: 37 Time: 2019-02-13

21:35:18.770062
ID: 38 Game: numbersStarred Session: 25 Window: 38 Time: 2019-02-13
21:35:20.686837
ID: 38 Game: numbersStarred Session: 25 Window: 39 Time: 2019-02-13
21:35:22.203617
ID: 38 Game: numbersStarred Session: 25 Window: 40 Time: 2019-02-13
21:35:23.570376
ID: 38 Game: numbersStarred Session: 25 Window: 41 Time: 2019-02-13
21:35:25.420564
ID: 38 Game: numbersStarred Session: 25 Window: 42 Time: 2019-02-13
21:35:27.387311
ID: 38 Game: numbersStarred Session: 25 Window: 43 Time: 2019-02-13
21:35:28.804102
ID: 38 Game: numbersStarred Session: 25 Window: 44 Time: 2019-02-13
21:35:30.820916
ID: 38 Game: numbersStarred Session: 25 Window: 45 Time: 2019-02-13
21:35:32.204298
ID: 38 Game: numbersStarred Session: 25 Window: 46 Time: 2019-02-13
21:35:33.554399
ID: 38 Game: numbersStarred Session: 25 Window: 47 Time: 2019-02-13
21:35:35.387871
ID: 38 Game: numbersStarred Session: 25 Window: 48 Time: 2019-02-13
21:35:37.338166
ID: 38 Game: numbersStarred Session: 25 Window: 49 Time: 2019-02-13
21:35:39.238336
ID: 38 Game: numbersStarred Session: 25 Window: 50 Time: 2019-02-13
21:35:41.021666
ID: 38 Game: numbersStarred Session: 25 Window: 51 Time: 2019-02-13
21:35:42.821724
ID: 38 Game: numbersStarred Session: 25 Window: 52 Time: 2019-02-13
21:35:44.521866
ID: 38 Game: numbersStarred Session: 25 Window: 53 Time: 2019-02-13
21:35:46.238588
ID: 38 Game: numbersStarred Session: 25 Window: 54 Time: 2019-02-13
21:35:48.172100
ID: 38 Game: numbersStarred Session: 25 Window: 55 Time: 2019-02-13
21:35:49.838881
ID: 38 Game: numbersStarred Session: 25 Window: 56 Time: 2019-02-13
21:35:51.672383
ID: 38 Game: numbersStarred Session: 25 Window: 57 Time: 2019-02-13
21:35:54.439203
ID: 38 Game: numbersStarred Session: 25 Window: 58 Time: 2019-02-13
21:35:56.339421
ID: 38 Game: numbersStarred Session: 25 Window: 59 Time: 2019-02-13
21:35:58.722877
ID: 38 Game: numbersStarred Session: 25 Window: 60 Time: 2019-02-13
21:36:00.806360
ID: 38 Game: numbersStarred Session: 25 Window: 61 Time: 2019-02-13

21:36:02.373168

ID: 38 Game: numbersStarred Session: 25 Window: 62 Time: 2019-02-13

21:36:04.590007

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

ID: 38 Game: numbersStarred Session: 26 Window: 0 Time: 2019-02-14

09:26:06.566188

ID: 38 Game: numbersStarred Session: 26 Window: 1 Time: 2019-02-14

09:26:08.479111

ID: 38 Game: numbersStarred Session: 26 Window: 2 Time: 2019-02-14

09:26:10.095854

ID: 38 Game: numbersStarred Session: 26 Window: 3 Time: 2019-02-14

09:26:11.862618

ID: 38 Game: numbersStarred Session: 26 Window: 4 Time: 2019-02-14

09:26:13.879544

ID: 38 Game: numbersStarred Session: 26 Window: 5 Time: 2019-02-14

09:26:15.312875

ID: 38 Game: numbersStarred Session: 26 Window: 6 Time: 2019-02-14

09:26:16.829606

ID: 38 Game: numbersStarred Session: 26 Window: 7 Time: 2019-02-14

09:26:18.629794

ID: 38 Game: numbersStarred Session: 26 Window: 8 Time: 2019-02-14

09:26:20.146565

ID: 38 Game: numbersStarred Session: 26 Window: 9 Time: 2019-02-14

09:26:22.080143

ID: 38 Game: numbersStarred Session: 26 Window: 10 Time: 2019-02-14

09:26:23.663586

ID: 38 Game: numbersStarred Session: 26 Window: 11 Time: 2019-02-14

09:26:25.313577

ID: 38 Game: numbersStarred Session: 26 Window: 12 Time: 2019-02-14

09:26:26.680434

ID: 38 Game: numbersStarred Session: 26 Window: 13 Time: 2019-02-14

09:26:28.280482

ID: 38 Game: numbersStarred Session: 26 Window: 14 Time: 2019-02-14

09:26:29.497207

ID: 38 Game: numbersStarred Session: 26 Window: 15 Time: 2019-02-14

09:26:31.013988

ID: 38 Game: numbersStarred Session: 26 Window: 16 Time: 2019-02-14

09:26:32.830811

ID: 38 Game: numbersStarred Session: 26 Window: 17 Time: 2019-02-14

09:26:34.414272

ID: 38 Game: numbersStarred Session: 26 Window: 18 Time: 2019-02-14

```

09:26:36.197726
ID: 38 Game: numbersStarred Session: 26 Window: 19 Time: 2019-02-14
09:26:39.331326
ID: 38 Game: numbersStarred Session: 26 Window: 20 Time: 2019-02-14
09:26:42.098195
ID: 38 Game: numbersStarred Session: 26 Window: 21 Time: 2019-02-14
09:26:45.081709
ID: 38 Game: numbersStarred Session: 26 Window: 22 Time: 2019-02-14
09:26:48.415314
ID: 38 Game: numbersStarred Session: 26 Window: 23 Time: 2019-02-14
09:26:49.965385
ID: 38 Game: numbersStarred Session: 26 Window: 24 Time: 2019-02-14
09:26:51.948869
ID: 38 Game: numbersStarred Session: 26 Window: 25 Time: 2019-02-14
09:26:53.532299
ID: 38 Game: numbersStarred Session: 26 Window: 26 Time: 2019-02-14
09:26:54.982390
ID: 38 Game: numbersStarred Session: 26 Window: 27 Time: 2019-02-14
09:26:56.599167
ID: 38 Game: numbersStarred Session: 26 Window: 28 Time: 2019-02-14
09:26:58.365988
ID: 38 Game: numbersStarred Session: 26 Window: 29 Time: 2019-02-14
09:27:00.416096
ID: 38 Game: numbersStarred Session: 26 Window: 30 Time: 2019-02-14
09:27:02.432898
ID: 38 Game: numbersStarred Session: 26 Window: 31 Time: 2019-02-14
09:27:04.216378

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
ret = ret.dtype.type(ret / rcount)
```

```

ID: 38 Game: numbersStarred Session: 27 Window: 0 Time: 2019-02-14
13:03:26.351482
ID: 38 Game: numbersStarred Session: 27 Window: 1 Time: 2019-02-14
13:03:28.399569
ID: 38 Game: numbersStarred Session: 27 Window: 2 Time: 2019-02-14
13:03:29.582987
ID: 38 Game: numbersStarred Session: 27 Window: 3 Time: 2019-02-14
13:03:31.233084
ID: 38 Game: numbersStarred Session: 27 Window: 4 Time: 2019-02-14
13:03:32.749898
ID: 38 Game: numbersStarred Session: 27 Window: 5 Time: 2019-02-14
13:03:34.683288
ID: 38 Game: numbersStarred Session: 27 Window: 6 Time: 2019-02-14

```


13:03:36.500076				
ID: 38	Game: numbersStarred	Session: 27	Window: 7	Time: 2019-02-14
13:03:37.950195				
ID: 38	Game: numbersStarred	Session: 27	Window: 8	Time: 2019-02-14
13:03:39.583654				
ID: 38	Game: numbersStarred	Session: 27	Window: 9	Time: 2019-02-14
13:03:41.450451				
ID: 38	Game: numbersStarred	Session: 27	Window: 10	Time: 2019-02-14
13:03:43.133850				
ID: 38	Game: numbersStarred	Session: 27	Window: 11	Time: 2019-02-14
13:03:45.067370				
ID: 38	Game: numbersStarred	Session: 27	Window: 12	Time: 2019-02-14
13:03:47.084163				
ID: 38	Game: numbersStarred	Session: 27	Window: 13	Time: 2019-02-14
13:03:48.867660				
ID: 38	Game: numbersStarred	Session: 27	Window: 14	Time: 2019-02-14
13:03:50.851147				
ID: 38	Game: numbersStarred	Session: 27	Window: 15	Time: 2019-02-14
13:03:53.534606				
ID: 38	Game: numbersStarred	Session: 27	Window: 16	Time: 2019-02-14
13:03:55.701426				
ID: 38	Game: numbersStarred	Session: 27	Window: 17	Time: 2019-02-14
13:03:57.584941				
ID: 38	Game: numbersStarred	Session: 27	Window: 18	Time: 2019-02-14
13:03:59.968435				
ID: 38	Game: numbersStarred	Session: 27	Window: 19	Time: 2019-02-14
13:04:01.518534				
ID: 38	Game: numbersStarred	Session: 27	Window: 20	Time: 2019-02-14
13:04:03.935366				
ID: 38	Game: numbersStarred	Session: 27	Window: 21	Time: 2019-02-14
13:04:05.452153				
ID: 38	Game: numbersStarred	Session: 27	Window: 22	Time: 2019-02-14
13:04:07.468996				
ID: 38	Game: numbersStarred	Session: 27	Window: 23	Time: 2019-02-14
13:04:09.169217				
ID: 38	Game: numbersStarred	Session: 27	Window: 24	Time: 2019-02-14
13:04:10.619912				
ID: 38	Game: numbersStarred	Session: 27	Window: 25	Time: 2019-02-14
13:04:12.586036				
ID: 38	Game: numbersStarred	Session: 27	Window: 26	Time: 2019-02-14
13:04:14.119436				
ID: 38	Game: numbersStarred	Session: 27	Window: 27	Time: 2019-02-14
13:04:16.186304				
ID: 38	Game: numbersStarred	Session: 27	Window: 28	Time: 2019-02-14
13:04:18.203088				
ID: 38	Game: numbersStarred	Session: 27	Window: 29	Time: 2019-02-14
13:04:20.219957				
ID: 38	Game: numbersStarred	Session: 27	Window: 30	Time: 2019-02-14

13:04:22.186736

ID: 38 Game: numbersStarred Session: 27 Window: 31 Time: 2019-02-14

13:04:24.086954

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 28 Window: 0 Time: 2019-02-14

22:13:31.095166

ID: 38 Game: numbersStarred Session: 28 Window: 1 Time: 2019-02-14

22:13:32.692897

ID: 38 Game: numbersStarred Session: 28 Window: 2 Time: 2019-02-14

22:13:33.926288

ID: 38 Game: numbersStarred Session: 28 Window: 3 Time: 2019-02-14

22:13:36.176473

ID: 38 Game: numbersStarred Session: 28 Window: 4 Time: 2019-02-14

22:13:37.659921

ID: 38 Game: numbersStarred Session: 28 Window: 5 Time: 2019-02-14

22:13:39.193326

ID: 38 Game: numbersStarred Session: 28 Window: 6 Time: 2019-02-14

22:13:40.426717

ID: 38 Game: numbersStarred Session: 28 Window: 7 Time: 2019-02-14

22:13:42.560214

ID: 38 Game: numbersStarred Session: 28 Window: 8 Time: 2019-02-14

22:13:44.276970

ID: 38 Game: numbersStarred Session: 28 Window: 9 Time: 2019-02-14

22:13:45.893766

ID: 38 Game: numbersStarred Session: 28 Window: 10 Time: 2019-02-14

22:13:47.643956

ID: 38 Game: numbersStarred Session: 28 Window: 11 Time: 2019-02-14

22:13:49.327323

ID: 38 Game: numbersStarred Session: 28 Window: 12 Time: 2019-02-14

22:13:51.127480

ID: 38 Game: numbersStarred Session: 28 Window: 13 Time: 2019-02-14

22:13:53.010928

ID: 38 Game: numbersStarred Session: 28 Window: 14 Time: 2019-02-14

22:13:54.861014

ID: 38 Game: numbersStarred Session: 28 Window: 15 Time: 2019-02-14

22:13:56.711148

ID: 38 Game: numbersStarred Session: 28 Window: 16 Time: 2019-02-14

22:13:58.327949

ID: 38 Game: numbersStarred Session: 28 Window: 17 Time: 2019-02-14

22:14:00.861453

ID: 38 Game: numbersStarred Session: 28 Window: 18 Time: 2019-02-14

22:14:02.511598
ID: 38 Game: numbersStarred Session: 28 Window: 19 Time: 2019-02-14
22:14:04.395008
ID: 38 Game: numbersStarred Session: 28 Window: 20 Time: 2019-02-14
22:14:06.111861
ID: 38 Game: numbersStarred Session: 28 Window: 21 Time: 2019-02-14
22:14:07.911913
ID: 38 Game: numbersStarred Session: 28 Window: 22 Time: 2019-02-14
22:14:09.578752
ID: 38 Game: numbersStarred Session: 28 Window: 23 Time: 2019-02-14
22:14:11.662163
ID: 38 Game: numbersStarred Session: 28 Window: 24 Time: 2019-02-14
22:14:13.195602
ID: 38 Game: numbersStarred Session: 28 Window: 25 Time: 2019-02-14
22:14:15.145791
ID: 38 Game: numbersStarred Session: 28 Window: 26 Time: 2019-02-14
22:14:16.679254
ID: 38 Game: numbersStarred Session: 28 Window: 27 Time: 2019-02-14
22:14:18.095934
ID: 38 Game: numbersStarred Session: 28 Window: 28 Time: 2019-02-14
22:14:20.562784
ID: 38 Game: numbersStarred Session: 28 Window: 29 Time: 2019-02-14
22:14:22.062906
ID: 38 Game: numbersStarred Session: 28 Window: 30 Time: 2019-02-14
22:14:24.413025
ID: 38 Game: numbersStarred Session: 28 Window: 31 Time: 2019-02-14
22:14:26.246501

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 29 Window: 0 Time: 2019-02-15
08:55:26.149581
ID: 38 Game: numbersStarred Session: 29 Window: 1 Time: 2019-02-15
08:55:28.016357
ID: 38 Game: numbersStarred Session: 29 Window: 2 Time: 2019-02-15
08:55:29.266460
ID: 38 Game: numbersStarred Session: 29 Window: 3 Time: 2019-02-15
08:55:30.916563
ID: 38 Game: numbersStarred Session: 29 Window: 4 Time: 2019-02-15
08:55:32.550030
ID: 38 Game: numbersStarred Session: 29 Window: 5 Time: 2019-02-15
08:55:34.583487
ID: 38 Game: numbersStarred Session: 29 Window: 6 Time: 2019-02-15

08:55:36.450312				
ID: 38	Game: numbersStarred	Session: 29	Window: 7	Time: 2019-02-15
08:55:37.917076				
ID: 38	Game: numbersStarred	Session: 29	Window: 8	Time: 2019-02-15
08:55:39.400461				
ID: 38	Game: numbersStarred	Session: 29	Window: 9	Time: 2019-02-15
08:55:41.283966				
ID: 38	Game: numbersStarred	Session: 29	Window: 10	Time: 2019-02-15
08:55:42.817414				
ID: 38	Game: numbersStarred	Session: 29	Window: 11	Time: 2019-02-15
08:55:44.150815				
ID: 38	Game: numbersStarred	Session: 29	Window: 12	Time: 2019-02-15
08:55:45.600939				
ID: 38	Game: numbersStarred	Session: 29	Window: 13	Time: 2019-02-15
08:55:47.167725				
ID: 38	Game: numbersStarred	Session: 29	Window: 14	Time: 2019-02-15
08:55:49.051238				
ID: 38	Game: numbersStarred	Session: 29	Window: 15	Time: 2019-02-15
08:55:50.317935				
ID: 38	Game: numbersStarred	Session: 29	Window: 16	Time: 2019-02-15
08:55:52.301431				
ID: 38	Game: numbersStarred	Session: 29	Window: 17	Time: 2019-02-15
08:55:54.068228				
ID: 38	Game: numbersStarred	Session: 29	Window: 18	Time: 2019-02-15
08:55:55.901703				
ID: 38	Game: numbersStarred	Session: 29	Window: 19	Time: 2019-02-15
08:55:57.401769				
ID: 38	Game: numbersStarred	Session: 29	Window: 20	Time: 2019-02-15
08:55:59.551966				
ID: 38	Game: numbersStarred	Session: 29	Window: 21	Time: 2019-02-15
08:56:01.235411				
ID: 38	Game: numbersStarred	Session: 29	Window: 22	Time: 2019-02-15
08:56:02.769006				
ID: 38	Game: numbersStarred	Session: 29	Window: 23	Time: 2019-02-15
08:56:04.335680				
ID: 38	Game: numbersStarred	Session: 29	Window: 24	Time: 2019-02-15
08:56:09.152616				
ID: 38	Game: numbersStarred	Session: 29	Window: 25	Time: 2019-02-15
08:56:10.969417				
ID: 38	Game: numbersStarred	Session: 29	Window: 26	Time: 2019-02-15
08:56:13.804055				
ID: 38	Game: numbersStarred	Session: 29	Window: 27	Time: 2019-02-15
08:56:16.069787				
ID: 38	Game: numbersStarred	Session: 29	Window: 28	Time: 2019-02-15
08:56:17.503186				
ID: 38	Game: numbersStarred	Session: 29	Window: 29	Time: 2019-02-15
08:56:19.436691				
ID: 38	Game: numbersStarred	Session: 29	Window: 30	Time: 2019-02-15

08:56:21.837033

ID: 38 Game: numbersStarred Session: 29 Window: 31 Time: 2019-02-15

08:56:23.720306

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 30 Window: 0 Time: 2019-02-15

13:19:52.145077

ID: 38 Game: numbersStarred Session: 30 Window: 1 Time: 2019-02-15

13:19:53.623522

ID: 38 Game: numbersStarred Session: 30 Window: 2 Time: 2019-02-15

13:19:56.140407

ID: 38 Game: numbersStarred Session: 30 Window: 3 Time: 2019-02-15

13:19:57.390459

ID: 38 Game: numbersStarred Session: 30 Window: 4 Time: 2019-02-15

13:19:59.223958

ID: 38 Game: numbersStarred Session: 30 Window: 5 Time: 2019-02-15

13:20:00.874105

ID: 38 Game: numbersStarred Session: 30 Window: 6 Time: 2019-02-15

13:20:02.690848

ID: 38 Game: numbersStarred Session: 30 Window: 7 Time: 2019-02-15

13:20:04.274313

ID: 38 Game: numbersStarred Session: 30 Window: 8 Time: 2019-02-15

13:20:06.507790

ID: 38 Game: numbersStarred Session: 30 Window: 9 Time: 2019-02-15

13:20:08.091213

ID: 38 Game: numbersStarred Session: 30 Window: 10 Time: 2019-02-15

13:20:09.891391

ID: 38 Game: numbersStarred Session: 30 Window: 11 Time: 2019-02-15

13:20:11.741484

ID: 38 Game: numbersStarred Session: 30 Window: 12 Time: 2019-02-15

13:20:13.758328

ID: 38 Game: numbersStarred Session: 30 Window: 13 Time: 2019-02-15

13:20:15.075086

ID: 38 Game: numbersStarred Session: 30 Window: 14 Time: 2019-02-15

13:20:16.708509

ID: 38 Game: numbersStarred Session: 30 Window: 15 Time: 2019-02-15

13:20:18.208698

ID: 38 Game: numbersStarred Session: 30 Window: 16 Time: 2019-02-15

13:20:19.391970

ID: 38 Game: numbersStarred Session: 30 Window: 17 Time: 2019-02-15

13:20:20.642061

ID: 38 Game: numbersStarred Session: 30 Window: 18 Time: 2019-02-15

13:20:22.558928
ID: 38 Game: numbersStarred Session: 30 Window: 19 Time: 2019-02-15
13:20:24.392345
ID: 38 Game: numbersStarred Session: 30 Window: 20 Time: 2019-02-15
13:20:26.592528
ID: 38 Game: numbersStarred Session: 30 Window: 21 Time: 2019-02-15
13:20:28.442655
ID: 38 Game: numbersStarred Session: 30 Window: 22 Time: 2019-02-15
13:20:29.892794
ID: 38 Game: numbersStarred Session: 30 Window: 23 Time: 2019-02-15
13:20:31.193115
ID: 38 Game: numbersStarred Session: 30 Window: 24 Time: 2019-02-15
13:20:33.759721
ID: 38 Game: numbersStarred Session: 30 Window: 25 Time: 2019-02-15
13:20:36.159909
ID: 38 Game: numbersStarred Session: 30 Window: 26 Time: 2019-02-15
13:20:37.910045
ID: 38 Game: numbersStarred Session: 30 Window: 27 Time: 2019-02-15
13:20:39.093433
ID: 38 Game: numbersStarred Session: 30 Window: 28 Time: 2019-02-15
13:20:40.626844
ID: 38 Game: numbersStarred Session: 30 Window: 29 Time: 2019-02-15
13:20:42.710333
ID: 38 Game: numbersStarred Session: 30 Window: 30 Time: 2019-02-15
13:20:44.477189
ID: 38 Game: numbersStarred Session: 30 Window: 31 Time: 2019-02-15
13:20:46.060552

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 31 Window: 0 Time: 2019-02-15
22:33:08.950629
ID: 38 Game: numbersStarred Session: 31 Window: 1 Time: 2019-02-15
22:33:10.829530
ID: 38 Game: numbersStarred Session: 31 Window: 2 Time: 2019-02-15
22:33:12.829629
ID: 38 Game: numbersStarred Session: 31 Window: 3 Time: 2019-02-15
22:33:14.579812
ID: 38 Game: numbersStarred Session: 31 Window: 4 Time: 2019-02-15
22:33:16.413194
ID: 38 Game: numbersStarred Session: 31 Window: 5 Time: 2019-02-15
22:33:17.663284
ID: 38 Game: numbersStarred Session: 31 Window: 6 Time: 2019-02-15

22:33:19.780100
ID: 38 Game: numbersStarred Session: 31 Window: 7 Time: 2019-02-15
22:33:21.813598
ID: 38 Game: numbersStarred Session: 31 Window: 8 Time: 2019-02-15
22:33:23.297037
ID: 38 Game: numbersStarred Session: 31 Window: 9 Time: 2019-02-15
22:33:25.380519
ID: 38 Game: numbersStarred Session: 31 Window: 10 Time: 2019-02-15
22:33:27.013943
ID: 38 Game: numbersStarred Session: 31 Window: 11 Time: 2019-02-15
22:33:28.464062
ID: 38 Game: numbersStarred Session: 31 Window: 12 Time: 2019-02-15
22:33:30.730889
ID: 38 Game: numbersStarred Session: 31 Window: 13 Time: 2019-02-15
22:33:32.414440
ID: 38 Game: numbersStarred Session: 31 Window: 14 Time: 2019-02-15
22:33:33.747856
ID: 38 Game: numbersStarred Session: 31 Window: 15 Time: 2019-02-15
22:33:36.081321
ID: 38 Game: numbersStarred Session: 31 Window: 16 Time: 2019-02-15
22:33:38.031515
ID: 38 Game: numbersStarred Session: 31 Window: 17 Time: 2019-02-15
22:33:42.531754
ID: 38 Game: numbersStarred Session: 31 Window: 18 Time: 2019-02-15
22:33:44.765237
ID: 38 Game: numbersStarred Session: 31 Window: 19 Time: 2019-02-15
22:33:46.248667
ID: 38 Game: numbersStarred Session: 31 Window: 20 Time: 2019-02-15
22:33:47.748815
ID: 38 Game: numbersStarred Session: 31 Window: 21 Time: 2019-02-15
22:33:49.582323
ID: 38 Game: numbersStarred Session: 31 Window: 22 Time: 2019-02-15
22:33:51.449306
ID: 38 Game: numbersStarred Session: 31 Window: 23 Time: 2019-02-15
22:33:52.965850
ID: 38 Game: numbersStarred Session: 31 Window: 24 Time: 2019-02-15
22:33:55.416032
ID: 38 Game: numbersStarred Session: 31 Window: 25 Time: 2019-02-15
22:33:57.516155
ID: 38 Game: numbersStarred Session: 31 Window: 26 Time: 2019-02-15
22:33:59.649687
ID: 38 Game: numbersStarred Session: 31 Window: 27 Time: 2019-02-15
22:34:01.983196
ID: 38 Game: numbersStarred Session: 31 Window: 28 Time: 2019-02-15
22:34:03.850000
ID: 38 Game: numbersStarred Session: 31 Window: 29 Time: 2019-02-15
22:34:05.350083
ID: 38 Game: numbersStarred Session: 31 Window: 30 Time: 2019-02-15

22:34:07.533600

ID: 38 Game: numbersStarred Session: 31 Window: 31 Time: 2019-02-15

22:34:09.167043

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
    ret = ret.dtype.type(ret / rcount)
```

ID: 38 Game: numbersStarred Session: 32 Window: 0 Time: 2019-02-16

08:43:39.902242

ID: 38 Game: numbersStarred Session: 32 Window: 1 Time: 2019-02-16

08:43:41.400585

ID: 38 Game: numbersStarred Session: 32 Window: 2 Time: 2019-02-16

08:43:43.334052

ID: 38 Game: numbersStarred Session: 32 Window: 3 Time: 2019-02-16

08:43:45.167507

ID: 38 Game: numbersStarred Session: 32 Window: 4 Time: 2019-02-16

08:43:46.967678

ID: 38 Game: numbersStarred Session: 32 Window: 5 Time: 2019-02-16

08:43:48.934444

ID: 38 Game: numbersStarred Session: 32 Window: 6 Time: 2019-02-16

08:43:50.617889

ID: 38 Game: numbersStarred Session: 32 Window: 7 Time: 2019-02-16

08:43:52.017993

ID: 38 Game: numbersStarred Session: 32 Window: 8 Time: 2019-02-16

08:43:53.301423

ID: 38 Game: numbersStarred Session: 32 Window: 9 Time: 2019-02-16

08:43:54.684878

ID: 38 Game: numbersStarred Session: 32 Window: 10 Time: 2019-02-16

08:43:56.018287

ID: 38 Game: numbersStarred Session: 32 Window: 11 Time: 2019-02-16

08:43:57.485161

ID: 38 Game: numbersStarred Session: 32 Window: 12 Time: 2019-02-16

08:43:59.018507

ID: 38 Game: numbersStarred Session: 32 Window: 13 Time: 2019-02-16

08:44:00.751993

ID: 38 Game: numbersStarred Session: 32 Window: 14 Time: 2019-02-16

08:44:03.068822

ID: 38 Game: numbersStarred Session: 32 Window: 15 Time: 2019-02-16

08:44:04.702286

ID: 38 Game: numbersStarred Session: 32 Window: 16 Time: 2019-02-16

08:44:06.569047

ID: 38 Game: numbersStarred Session: 32 Window: 17 Time: 2019-02-16

08:44:08.369243

ID: 38 Game: numbersStarred Session: 32 Window: 18 Time: 2019-02-16

08:44:09.936007
ID: 38 Game: numbersStarred Session: 32 Window: 19 Time: 2019-02-16
08:44:11.336186
ID: 38 Game: numbersStarred Session: 32 Window: 20 Time: 2019-02-16
08:44:12.686154
ID: 38 Game: numbersStarred Session: 32 Window: 21 Time: 2019-02-16
08:44:14.302950
ID: 38 Game: numbersStarred Session: 32 Window: 22 Time: 2019-02-16
08:44:15.719709
ID: 38 Game: numbersStarred Session: 32 Window: 23 Time: 2019-02-16
08:44:17.669834
ID: 38 Game: numbersStarred Session: 32 Window: 24 Time: 2019-02-16
08:44:18.903262
ID: 38 Game: numbersStarred Session: 32 Window: 25 Time: 2019-02-16
08:44:20.303398
ID: 38 Game: numbersStarred Session: 32 Window: 26 Time: 2019-02-16
08:44:21.786822
ID: 38 Game: numbersStarred Session: 32 Window: 27 Time: 2019-02-16
08:44:23.370263
ID: 38 Game: numbersStarred Session: 32 Window: 28 Time: 2019-02-16
08:44:25.120415
ID: 38 Game: numbersStarred Session: 32 Window: 29 Time: 2019-02-16
08:44:26.703897
ID: 38 Game: numbersStarred Session: 32 Window: 30 Time: 2019-02-16
08:44:28.870702
ID: 38 Game: numbersStarred Session: 32 Window: 31 Time: 2019-02-16
08:44:30.120754

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 33 Window: 0 Time: 2019-02-16
13:16:49.017171
ID: 38 Game: numbersStarred Session: 33 Window: 1 Time: 2019-02-16
13:16:50.430734
ID: 38 Game: numbersStarred Session: 33 Window: 2 Time: 2019-02-16
13:16:52.112939
ID: 38 Game: numbersStarred Session: 33 Window: 3 Time: 2019-02-16
13:16:53.912846
ID: 38 Game: numbersStarred Session: 33 Window: 4 Time: 2019-02-16
13:16:55.362960
ID: 38 Game: numbersStarred Session: 33 Window: 5 Time: 2019-02-16
13:16:56.713078
ID: 38 Game: numbersStarred Session: 33 Window: 6 Time: 2019-02-16

13:16:58.063142				
ID: 38	Game: numbersStarred	Session: 33	Window: 7	Time: 2019-02-16
13:16:59.563293				
ID: 38	Game: numbersStarred	Session: 33	Window: 8	Time: 2019-02-16
13:17:00.863363				
ID: 38	Game: numbersStarred	Session: 33	Window: 9	Time: 2019-02-16
13:17:02.196778				
ID: 38	Game: numbersStarred	Session: 33	Window: 10	Time: 2019-02-16
13:17:04.330264				
ID: 38	Game: numbersStarred	Session: 33	Window: 11	Time: 2019-02-16
13:17:05.747040				
ID: 38	Game: numbersStarred	Session: 33	Window: 12	Time: 2019-02-16
13:17:07.430499				
ID: 38	Game: numbersStarred	Session: 33	Window: 13	Time: 2019-02-16
13:17:09.230627				
ID: 38	Game: numbersStarred	Session: 33	Window: 14	Time: 2019-02-16
13:17:10.747403				
ID: 38	Game: numbersStarred	Session: 33	Window: 15	Time: 2019-02-16
13:17:12.447548				
ID: 38	Game: numbersStarred	Session: 33	Window: 16	Time: 2019-02-16
13:17:13.964323				
ID: 38	Game: numbersStarred	Session: 33	Window: 17	Time: 2019-02-16
13:17:15.381133				
ID: 38	Game: numbersStarred	Session: 33	Window: 18	Time: 2019-02-16
13:17:17.064525				
ID: 38	Game: numbersStarred	Session: 33	Window: 19	Time: 2019-02-16
13:17:18.681290				
ID: 38	Game: numbersStarred	Session: 33	Window: 20	Time: 2019-02-16
13:17:20.414922				
ID: 38	Game: numbersStarred	Session: 33	Window: 21	Time: 2019-02-16
13:17:22.148251				
ID: 38	Game: numbersStarred	Session: 33	Window: 22	Time: 2019-02-16
13:17:24.148359				
ID: 38	Game: numbersStarred	Session: 33	Window: 23	Time: 2019-02-16
13:17:26.315222				
ID: 38	Game: numbersStarred	Session: 33	Window: 24	Time: 2019-02-16
13:17:27.815319				
ID: 38	Game: numbersStarred	Session: 33	Window: 25	Time: 2019-02-16
13:17:29.515623				
ID: 38	Game: numbersStarred	Session: 33	Window: 26	Time: 2019-02-16
13:17:31.065543				
ID: 38	Game: numbersStarred	Session: 33	Window: 27	Time: 2019-02-16
13:17:32.632373				
ID: 38	Game: numbersStarred	Session: 33	Window: 28	Time: 2019-02-16
13:17:34.232407				
ID: 38	Game: numbersStarred	Session: 33	Window: 29	Time: 2019-02-16
13:17:36.899326				
ID: 38	Game: numbersStarred	Session: 33	Window: 30	Time: 2019-02-16

13:17:38.399417

ID: 38 Game: numbersStarred Session: 33 Window: 31 Time: 2019-02-16

13:17:39.799566

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 34 Window: 0 Time: 2019-02-16

19:52:17.636466

ID: 38 Game: numbersStarred Session: 34 Window: 1 Time: 2019-02-16

19:52:19.114883

ID: 38 Game: numbersStarred Session: 34 Window: 2 Time: 2019-02-16

19:52:20.814982

ID: 38 Game: numbersStarred Session: 34 Window: 3 Time: 2019-02-16

19:52:22.915183

ID: 38 Game: numbersStarred Session: 34 Window: 4 Time: 2019-02-16

19:52:24.415283

ID: 38 Game: numbersStarred Session: 34 Window: 5 Time: 2019-02-16

19:52:26.532062

ID: 38 Game: numbersStarred Session: 34 Window: 6 Time: 2019-02-16

19:52:28.598822

ID: 38 Game: numbersStarred Session: 34 Window: 7 Time: 2019-02-16

19:52:30.098940

ID: 38 Game: numbersStarred Session: 34 Window: 8 Time: 2019-02-16

19:52:31.749061

ID: 38 Game: numbersStarred Session: 34 Window: 9 Time: 2019-02-16

19:52:33.665821

ID: 38 Game: numbersStarred Session: 34 Window: 10 Time: 2019-02-16

19:52:35.399302

ID: 38 Game: numbersStarred Session: 34 Window: 11 Time: 2019-02-16

19:52:36.916092

ID: 38 Game: numbersStarred Session: 34 Window: 12 Time: 2019-02-16

19:52:38.732854

ID: 38 Game: numbersStarred Session: 34 Window: 13 Time: 2019-02-16

19:52:40.283004

ID: 38 Game: numbersStarred Session: 34 Window: 14 Time: 2019-02-16

19:52:41.999708

ID: 38 Game: numbersStarred Session: 34 Window: 15 Time: 2019-02-16

19:52:44.316537

ID: 38 Game: numbersStarred Session: 34 Window: 16 Time: 2019-02-16

19:52:46.350005

ID: 38 Game: numbersStarred Session: 34 Window: 17 Time: 2019-02-16

19:52:47.966759

ID: 38 Game: numbersStarred Session: 34 Window: 18 Time: 2019-02-16

```

19:52:50.200264
ID: 38 Game: numbersStarred Session: 34 Window: 19 Time: 2019-02-16
19:52:52.067080
ID: 38 Game: numbersStarred Session: 34 Window: 20 Time: 2019-02-16
19:52:54.050508
ID: 38 Game: numbersStarred Session: 34 Window: 21 Time: 2019-02-16
19:52:56.300816
ID: 38 Game: numbersStarred Session: 34 Window: 22 Time: 2019-02-16
19:52:58.234125
ID: 38 Game: numbersStarred Session: 34 Window: 23 Time: 2019-02-16
19:53:00.001041
ID: 38 Game: numbersStarred Session: 34 Window: 24 Time: 2019-02-16
19:53:02.067775
ID: 38 Game: numbersStarred Session: 34 Window: 25 Time: 2019-02-16
19:53:03.851171
ID: 38 Game: numbersStarred Session: 34 Window: 26 Time: 2019-02-16
19:53:05.667966
ID: 38 Game: numbersStarred Session: 34 Window: 27 Time: 2019-02-16
19:53:07.151413
ID: 38 Game: numbersStarred Session: 34 Window: 28 Time: 2019-02-16
19:53:08.901537
ID: 38 Game: numbersStarred Session: 34 Window: 29 Time: 2019-02-16
19:53:11.435021
ID: 38 Game: numbersStarred Session: 34 Window: 30 Time: 2019-02-16
19:53:13.318489
ID: 38 Game: numbersStarred Session: 34 Window: 31 Time: 2019-02-16
19:53:15.035317

```

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

```
ret = ret.dtype.type(ret / rcount)
```

```

ID: 38 Game: numbersStarred Session: 35 Window: 0 Time: 2019-02-17
08:37:17.656498
ID: 38 Game: numbersStarred Session: 35 Window: 1 Time: 2019-02-17
08:37:19.287722
ID: 38 Game: numbersStarred Session: 35 Window: 2 Time: 2019-02-17
08:37:20.804507
ID: 38 Game: numbersStarred Session: 35 Window: 3 Time: 2019-02-17
08:37:22.738036
ID: 38 Game: numbersStarred Session: 35 Window: 4 Time: 2019-02-17
08:37:24.304724
ID: 38 Game: numbersStarred Session: 35 Window: 5 Time: 2019-02-17
08:37:25.821555
ID: 38 Game: numbersStarred Session: 35 Window: 6 Time: 2019-02-17

```

08:37:27.538294				
ID: 38	Game: numbersStarred	Session: 35	Window: 7	Time: 2019-02-17
08:37:29.288397				
ID: 38	Game: numbersStarred	Session: 35	Window: 8	Time: 2019-02-17
08:37:30.871863				
ID: 38	Game: numbersStarred	Session: 35	Window: 9	Time: 2019-02-17
08:37:32.171962				
ID: 38	Game: numbersStarred	Session: 35	Window: 10	Time: 2019-02-17
08:37:33.505413				
ID: 38	Game: numbersStarred	Session: 35	Window: 11	Time: 2019-02-17
08:37:34.955464				
ID: 38	Game: numbersStarred	Session: 35	Window: 12	Time: 2019-02-17
08:37:36.939009				
ID: 38	Game: numbersStarred	Session: 35	Window: 13	Time: 2019-02-17
08:37:38.172355				
ID: 38	Game: numbersStarred	Session: 35	Window: 14	Time: 2019-02-17
08:37:39.555829				
ID: 38	Game: numbersStarred	Session: 35	Window: 15	Time: 2019-02-17
08:37:41.172701				
ID: 38	Game: numbersStarred	Session: 35	Window: 16	Time: 2019-02-17
08:37:42.922727				
ID: 38	Game: numbersStarred	Session: 35	Window: 17	Time: 2019-02-17
08:37:45.222889				
ID: 38	Game: numbersStarred	Session: 35	Window: 18	Time: 2019-02-17
08:37:46.672968				
ID: 38	Game: numbersStarred	Session: 35	Window: 19	Time: 2019-02-17
08:37:48.323128				
ID: 38	Game: numbersStarred	Session: 35	Window: 20	Time: 2019-02-17
08:37:49.873221				
ID: 38	Game: numbersStarred	Session: 35	Window: 21	Time: 2019-02-17
08:37:52.556718				
ID: 38	Game: numbersStarred	Session: 35	Window: 22	Time: 2019-02-17
08:37:53.940170				
ID: 38	Game: numbersStarred	Session: 35	Window: 23	Time: 2019-02-17
08:37:55.956962				
ID: 38	Game: numbersStarred	Session: 35	Window: 24	Time: 2019-02-17
08:37:57.690410				
ID: 38	Game: numbersStarred	Session: 35	Window: 25	Time: 2019-02-17
08:37:59.423898				
ID: 38	Game: numbersStarred	Session: 35	Window: 26	Time: 2019-02-17
08:38:01.340676				
ID: 38	Game: numbersStarred	Session: 35	Window: 27	Time: 2019-02-17
08:38:03.040797				
ID: 38	Game: numbersStarred	Session: 35	Window: 28	Time: 2019-02-17
08:38:04.724242				
ID: 38	Game: numbersStarred	Session: 35	Window: 29	Time: 2019-02-17
08:38:06.491117				
ID: 38	Game: numbersStarred	Session: 35	Window: 30	Time: 2019-02-17

08:38:08.141194

ID: 38 Game: numbersStarred Session: 35 Window: 31 Time: 2019-02-17

08:38:09.907902

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 36 Window: 0 Time: 2019-02-17

13:17:51.291207

ID: 38 Game: numbersStarred Session: 36 Window: 1 Time: 2019-02-17

13:17:52.938208

ID: 38 Game: numbersStarred Session: 36 Window: 2 Time: 2019-02-17

13:17:54.404788

ID: 38 Game: numbersStarred Session: 36 Window: 3 Time: 2019-02-17

13:17:55.654910

ID: 38 Game: numbersStarred Session: 36 Window: 4 Time: 2019-02-17

13:17:57.471684

ID: 38 Game: numbersStarred Session: 36 Window: 5 Time: 2019-02-17

13:17:59.071783

ID: 38 Game: numbersStarred Session: 36 Window: 6 Time: 2019-02-17

13:18:00.605239

ID: 38 Game: numbersStarred Session: 36 Window: 7 Time: 2019-02-17

13:18:02.205389

ID: 38 Game: numbersStarred Session: 36 Window: 8 Time: 2019-02-17

13:18:04.605536

ID: 38 Game: numbersStarred Session: 36 Window: 9 Time: 2019-02-17

13:18:06.905681

ID: 38 Game: numbersStarred Session: 36 Window: 10 Time: 2019-02-17

13:18:08.122439

ID: 38 Game: numbersStarred Session: 36 Window: 11 Time: 2019-02-17

13:18:09.755880

ID: 38 Game: numbersStarred Session: 36 Window: 12 Time: 2019-02-17

13:18:12.656092

ID: 38 Game: numbersStarred Session: 36 Window: 13 Time: 2019-02-17

13:18:14.089528

ID: 38 Game: numbersStarred Session: 36 Window: 14 Time: 2019-02-17

13:18:15.389573

ID: 38 Game: numbersStarred Session: 36 Window: 15 Time: 2019-02-17

13:18:17.139744

ID: 38 Game: numbersStarred Session: 36 Window: 16 Time: 2019-02-17

13:18:18.856520

ID: 38 Game: numbersStarred Session: 36 Window: 17 Time: 2019-02-17

13:18:20.673392

ID: 38 Game: numbersStarred Session: 36 Window: 18 Time: 2019-02-17

13:18:22.873513
ID: 38 Game: numbersStarred Session: 36 Window: 19 Time: 2019-02-17
13:18:24.323590
ID: 38 Game: numbersStarred Session: 36 Window: 20 Time: 2019-02-17
13:18:26.006995
ID: 38 Game: numbersStarred Session: 36 Window: 21 Time: 2019-02-17
13:18:27.540527
ID: 38 Game: numbersStarred Session: 36 Window: 22 Time: 2019-02-17
13:18:29.273976
ID: 38 Game: numbersStarred Session: 36 Window: 23 Time: 2019-02-17
13:18:31.607486
ID: 38 Game: numbersStarred Session: 36 Window: 24 Time: 2019-02-17
13:18:33.040922
ID: 38 Game: numbersStarred Session: 36 Window: 25 Time: 2019-02-17
13:18:34.857680
ID: 38 Game: numbersStarred Session: 36 Window: 26 Time: 2019-02-17
13:18:36.341126
ID: 38 Game: numbersStarred Session: 36 Window: 27 Time: 2019-02-17
13:18:38.624639
ID: 38 Game: numbersStarred Session: 36 Window: 28 Time: 2019-02-17
13:18:40.741436
ID: 38 Game: numbersStarred Session: 36 Window: 29 Time: 2019-02-17
13:18:42.091516
ID: 38 Game: numbersStarred Session: 36 Window: 30 Time: 2019-02-17
13:18:43.558290
ID: 38 Game: numbersStarred Session: 36 Window: 31 Time: 2019-02-17
13:18:45.775109

//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:

RuntimeWarning: Mean of empty slice.

out=out, **kwargs)

//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:

RuntimeWarning: invalid value encountered in double_scalars

ret = ret.dtype.type(ret / rcount)

ID: 38 Game: numbersStarred Session: 37 Window: 0 Time: 2019-02-17
19:47:19.103651
ID: 38 Game: numbersStarred Session: 37 Window: 1 Time: 2019-02-17
19:47:21.517289
ID: 38 Game: numbersStarred Session: 37 Window: 2 Time: 2019-02-17
19:47:22.983996
ID: 38 Game: numbersStarred Session: 37 Window: 3 Time: 2019-02-17
19:47:25.200933
ID: 38 Game: numbersStarred Session: 37 Window: 4 Time: 2019-02-17
19:47:27.067692
ID: 38 Game: numbersStarred Session: 37 Window: 5 Time: 2019-02-17
19:47:28.817752
ID: 38 Game: numbersStarred Session: 37 Window: 6 Time: 2019-02-17

19:47:30.317825
ID: 38 Game: numbersStarred Session: 37 Window: 7 Time: 2019-02-17
19:47:32.134689
ID: 38 Game: numbersStarred Session: 37 Window: 8 Time: 2019-02-17
19:47:34.268168
ID: 38 Game: numbersStarred Session: 37 Window: 9 Time: 2019-02-17
19:47:36.051575
ID: 38 Game: numbersStarred Session: 37 Window: 10 Time: 2019-02-17
19:47:37.251657
ID: 38 Game: numbersStarred Session: 37 Window: 11 Time: 2019-02-17
19:47:38.468432
ID: 38 Game: numbersStarred Session: 37 Window: 12 Time: 2019-02-17
19:47:40.551890
ID: 38 Game: numbersStarred Session: 37 Window: 13 Time: 2019-02-17
19:47:42.602102
ID: 38 Game: numbersStarred Session: 37 Window: 14 Time: 2019-02-17
19:47:44.735523
ID: 38 Game: numbersStarred Session: 37 Window: 15 Time: 2019-02-17
19:47:46.702325
ID: 38 Game: numbersStarred Session: 37 Window: 16 Time: 2019-02-17
19:47:48.819138
ID: 38 Game: numbersStarred Session: 37 Window: 17 Time: 2019-02-17
19:47:50.869279
ID: 38 Game: numbersStarred Session: 37 Window: 18 Time: 2019-02-17
19:47:52.486169
ID: 38 Game: numbersStarred Session: 37 Window: 19 Time: 2019-02-17
19:47:54.236209
ID: 38 Game: numbersStarred Session: 37 Window: 20 Time: 2019-02-17
19:47:56.403016
ID: 38 Game: numbersStarred Session: 37 Window: 21 Time: 2019-02-17
19:47:57.869733
ID: 38 Game: numbersStarred Session: 37 Window: 22 Time: 2019-02-17
19:47:59.436523
ID: 38 Game: numbersStarred Session: 37 Window: 23 Time: 2019-02-17
19:48:01.888117
ID: 38 Game: numbersStarred Session: 37 Window: 24 Time: 2019-02-17
19:48:04.437009
ID: 38 Game: numbersStarred Session: 37 Window: 25 Time: 2019-02-17
19:48:06.103734
ID: 38 Game: numbersStarred Session: 37 Window: 26 Time: 2019-02-17
19:48:07.853801
ID: 38 Game: numbersStarred Session: 37 Window: 27 Time: 2019-02-17
19:48:09.604119
ID: 38 Game: numbersStarred Session: 37 Window: 28 Time: 2019-02-17
19:48:11.037347
ID: 38 Game: numbersStarred Session: 37 Window: 29 Time: 2019-02-17
19:48:12.754143
ID: 38 Game: numbersStarred Session: 37 Window: 30 Time: 2019-02-17

19:48:14.854257

ID: 38 Game: numbersStarred Session: 37 Window: 31 Time: 2019-02-17

19:48:17.254541

```
//anaconda/lib/python3.6/site-packages/numpy/core/fromnumeric.py:3118:
```

```
RuntimeWarning: Mean of empty slice.
```

```
    out=out, **kwargs)
```

```
//anaconda/lib/python3.6/site-packages/numpy/core/_methods.py:85:
```

```
RuntimeWarning: invalid value encountered in double_scalars
```

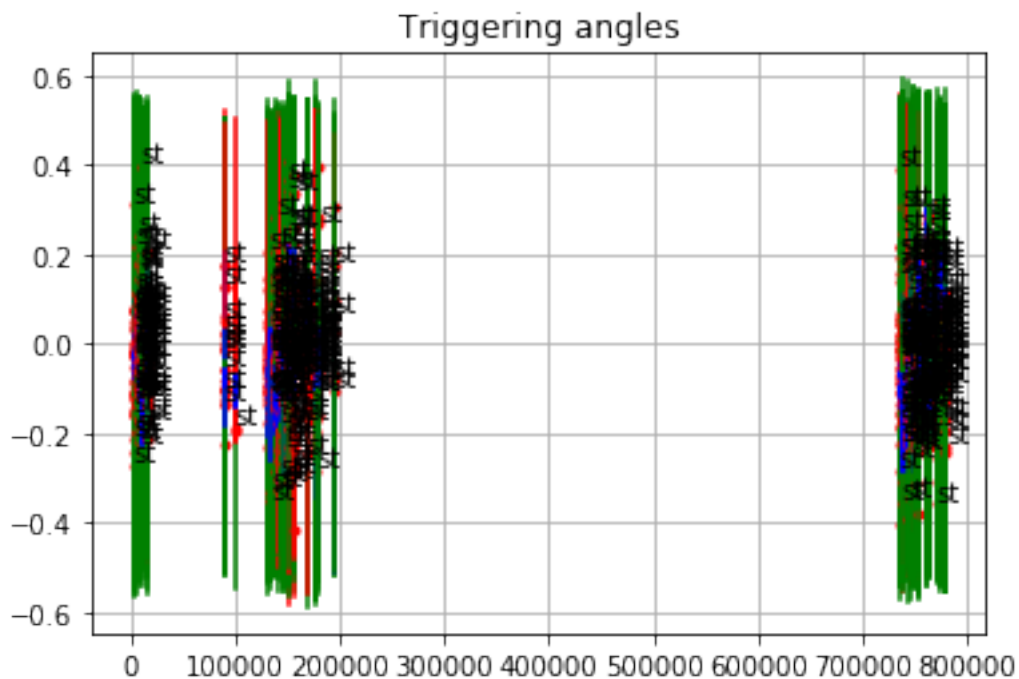
```
    ret = ret.dtype.type(ret / rcount)
```

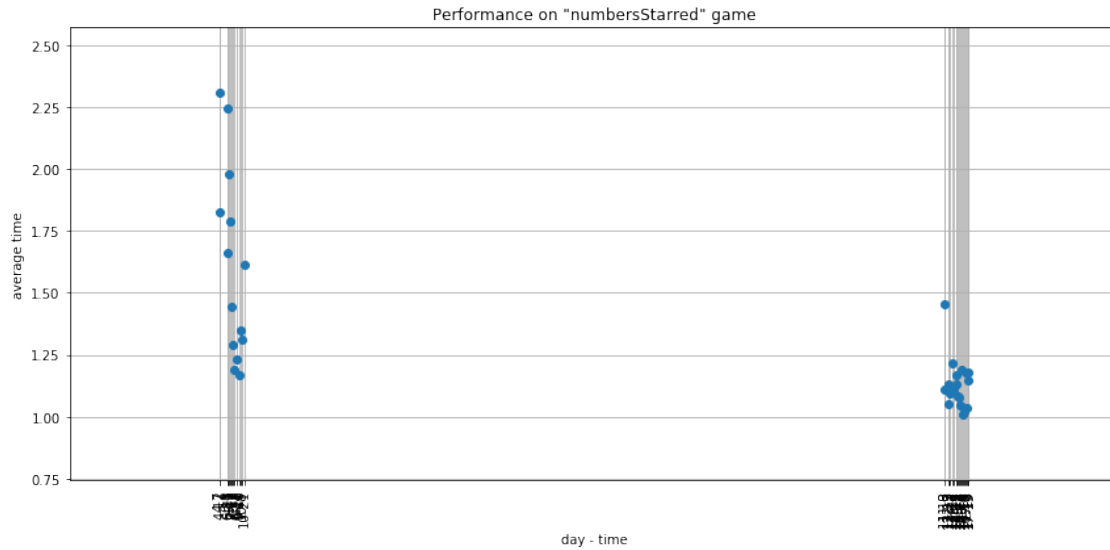
Average time of completion of numbersStarred in consecutive sessions

```
[2.31088435 1.82784998 1.6636718  2.24646968 1.97901713 1.78999176
 1.44575189 1.29273879 1.19051466 1.23050911 1.16860438 1.35099812
 1.31041592 1.61565333 1.4565097  1.11058765 1.05252799 1.13046788
 1.09368497 1.21690139 1.10990243 1.17061956 1.12914155 1.08516859
 1.07805464 1.04717509 1.19152638 1.00662443 1.02115367 1.17695531
 1.03789286 1.14674727 1.17702531]
```

Number of incorrect answers

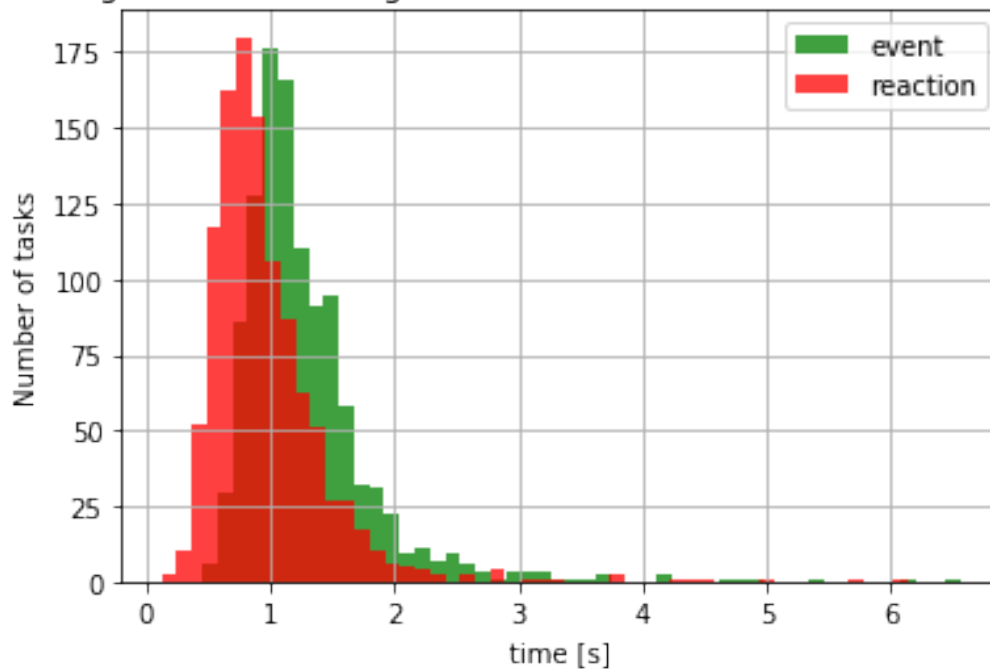
```
[3, 1, 1, 2, 1, 5, 0, 2, 1, 5, 5, 6, 2, 1, 2, 5, 3, 1, 2, 1, 4, 1, 1, 0, 2, 1,
 1, 0, 0, 1, 0, 1, 1]
```





Correlation between event and reaction times: 0.9611281965162554
 Correlation between event and reaction times without nans: 0.9611281965162554
 Correlation between event times without nans and L1: 0.10871312337468675
 Total incorrect (%): 5.646630236794172
 Incorrect with Star (%): 50.0
 Fallen for Star (%): 38.70967741935484
 Incorrect without Star (%): 50.0
 Incorrect with flip (%): 0.0
 Incorrect without flip (%): 100.0
 Total incorrect via flip (%): 100.0
 Total incorr. with lure (%): 19.35483870967742
 Incorr. 2nd and 3rd attempt: 17.741935483870968

Histograms of event registered and reaction times (numbersStarred)



ID: 38 Game: numbersStarred Session: 37

1.6.1 Inhibition in 'numberStarred'

- Let us now look into the output measures of the signal related to the specific game.
- In our case, we focus on 'numberStarred' and the effect of inhibition.

```
[7]: """
'Correct' is binary: 1 for a correct, 0 for incorrect answer
'Star' is binary: 1 when star present, 0 when star absent
'ET' is real: Event Time as recorded by the app
'RT': Reaction time as computed
'L1_trig': L1 norm of the triggering axis
'L1_rem': L1 norm of the remaining axis
'MD_trig': Maximal Deviation in opposite direction on the triggering axis
'MD_rem': Max Deviation of the remaining axis
'flip_trig': number of flips (turns) on the triggering axis
'flip_rem': number of flips on the remaining axis
'SE_trig': Sample Entropy of the triggering axis
'SE_rem': Sample Entropy on the remaining axis
"""

out_df = pandas.DataFrame({
    'Correct':corrIncorr_label,
```

```

'Star':array_st_all,
'ET':time_event_all_values,
'RT':time_reaction_all_values,
'L1_trig':L1_trigger_all,
'L1_rem':L1_remaining_all,
'MD_trig':MD_trigger_all,
'MD_rem': MD_remaining_all,
'flip_trig':flips_trigger_all,
'flip_rem':flips_remaining_all,
'SE_trig':SE_y_all,
'SE_rem': SE_z_all
})

```

- We are looking into the data generated by person ID = 38.
- The person has played 37 sessions of **numberStarred** game.

The number of trials played is given by:

```
[8]: print('Number of trials played by ID = %g is %g.' %(ID,len(out_df)))
```

Number of trials played by ID = 38 is 1098.

Let us drop NaN values and take a look into the generated dataframe.

```
[9]: out_df = out_df.dropna()
print('Number of trials after removing missing values is %g.' %len(out_df))
out_df.head()
```

Number of trials after removing missing values is 1098.

```
[9]:
```

	Correct	Star	ET	RT	L1_trig	L1_rem	MD_trig	MD_rem	\
0	1	0	1.91274	1.379466	0.401345	0.007522	0.002319	0.029438	
1	1	0	1.80024	1.539375	0.383120	0.013041	0.062588	0.018813	
2	1	0	1.21662	0.869690	0.551969	0.009854	0.151736	0.015861	
3	0	1	1.93337	1.719315	0.512425	0.175728	0.021988	0.505568	
4	1	1	1.56119	1.289464	0.639767	0.093573	0.475433	0.143712	

	flip_trig	flip_rem	SE_trig	SE_rem
0	1.0	2.0	0.020834	0.024382
1	3.0	6.0	0.020834	0.023371
2	2.0	4.0	0.020834	0.028523
3	3.0	3.0	0.020834	0.022857
4	3.0	4.0	0.022833	0.020834

We will make two dataframes - one corresponding to the trials with star and one to the trials without star present on the screen.

```
[10]: # set with Star(s)
out_Star = out_df[(out_df.Correct == 1) & (out_df.Star == 1)]
```

```
# set without Star(s)
out_noStar = out_df[(out_df.Correct == 1) & (out_df.Star == 0)]
```

Let us remove now superfluous columns 'Correct' and 'Star'.

Note. This means that we restrict our analysis only to the case when *answers are correct*.

```
[11]: out_Star = out_Star.drop(['Correct', 'Star'], axis = 1)
out_noStar = out_noStar.drop(['Correct', 'Star'], axis = 1)
out_Star.head()
```

```
[11]:
```

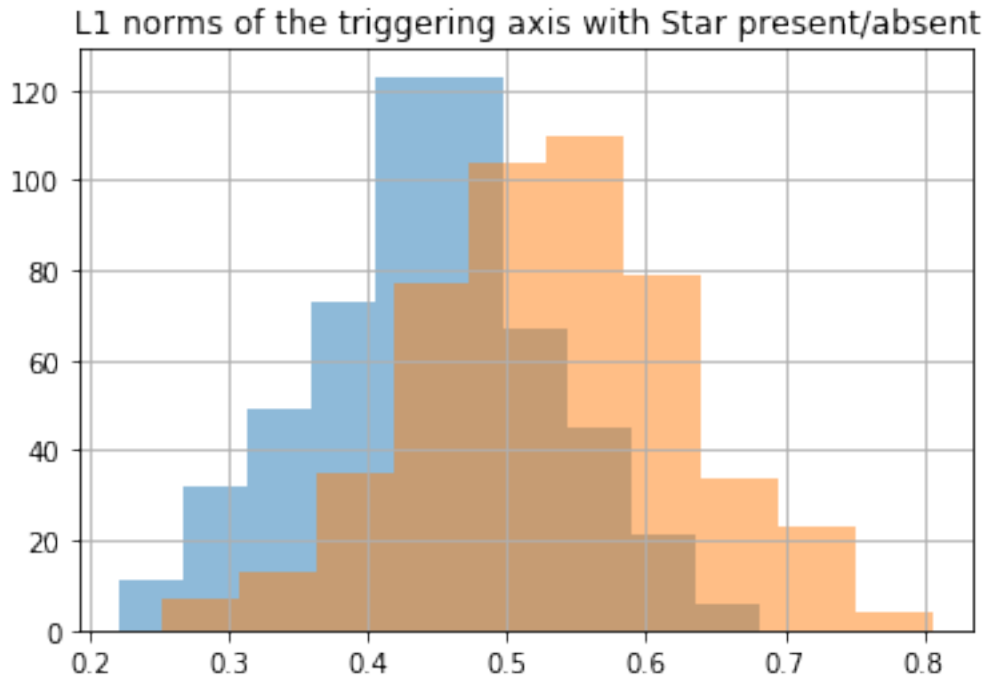
	ET	RT	L1_trig	L1_rem	MD_trig	MD_rem	flip_trig \
4	1.56119	1.289464	0.639767	0.093573	0.475433	0.143712	3.0
8	4.66648	4.258410	0.538255	0.015579	0.472238	0.072598	3.0
10	2.69677	2.349098	0.539925	0.071385	0.495058	0.111622	5.0
11	2.03043	1.509407	0.549904	0.034633	0.445146	0.090589	4.0
12	4.18215	3.778574	0.489068	0.040705	0.496461	0.101787	3.0

	flip_rem	SE_trig	SE_rem
4	4.0	0.022833	0.020834
8	3.0	0.022185	0.020834
10	2.0	0.020834	0.070581
11	12.0	0.026283	0.024098
12	1.0	0.020834	0.033715

1.7 Finding a statistical significance

Let us examine the behaviour of L1 norms on the leading (triggering) and remaining axis.

```
[13]: plt.title('L1 norms of the triggering axis with Star present/absent')
out_noStar.L1_trig.hist(alpha=0.5)
out_Star.L1_trig.hist(alpha=0.5)
plt.show()
```



Upon visual inspection, the histograms look like they could be generated by a normal distribution. This is a good news since this allows us to use standard tests like t-test. But to make sure that this is the case beyond visual inspection, we shall conduct a normal test.

```
[14]: def normalityTest(x):
        from scipy import stats
        k, p = stats.normaltest(x)
        alpha = 1e-3
        print("p = {:.g}".format(p))
        if p < alpha: # null hypothesis: out_Star.L1_trig comes from a normal
            →distribution
            print("The null hypothesis can be rejected")
        else:
            print("The null hypothesis cannot be rejected")

[15]: normalityTest(out_noStar.L1_trig)
        normalityTest(out_Star.L1_trig)
```

```
p = 0.651486
The null hypothesis cannot be rejected
p = 0.973625
The null hypothesis cannot be rejected
```

1.7.1 T-test Statistics

The Student's t-Test is a statistical hypothesis test for testing whether two samples are expected to have been drawn from the same population.

The p-value is compared to a chosen significance level (alpha) such as 0.05 or in our case 0.001 to determine if the null hypothesis can be rejected:

- If $p > \alpha$: Accept null hypothesis that the means are equal.
- If $p \leq \alpha$: Reject null hypothesis that the means are equal.

We shall use `scipy.stats` to calculate the T-test for the means of two independent samples of scores.

```
[16]: from scipy.stats import ttest_ind, ttest_ind_from_stats
      from scipy.special import stdtr

      a = out_noStar.L1_trig
      b = out_Star.L1_trig
      # Use scipy.stats.ttest_ind.
      t, p = ttest_ind(a, b, equal_var=False)
      print("ttest_ind:      t = %g  p = %g" % (t, p))
```

```
ttest_ind:      t = -14.933  p = 1.41804e-45
```

Now, let us look how L_1 -norms along the remaining axis behaves. Notice that we will have to make a log transformation because the non-Gaussian properties of the L_1 -norms along the non-leading axis.

```
[17]: t, p = ttest_ind(numpy.log(out_noStar.L1_rem), numpy.log(out_Star.L1_rem),
      →equal_var=False)
      print("ttest_ind:      t = %g  p = %g" % (t, p))
```

```
ttest_ind:      t = -1.81812  p = 0.0693348
```

We do not observe a statistical significance. **Question:** Why?

Answer: Because the nonleading axis is not relevant to pure inhibition.

1.7.2 Calculate Difference Effect Size

The difference between groups is often referred to as the “d family” of effect size methods.

This name comes from perhaps the most common method for calculating the difference between the mean value of groups, called Cohen’s d.

Cohen’s d measures the difference between the mean from two Gaussian-distributed variables. It is a standard score that summarizes the difference in terms of the number of standard deviations. Because the score is standardized, there is a table for the interpretation of the result, summarized as:

- Small Effect Size: $d=0.20$
- Medium Effect Size: $d=0.50$
- Large Effect Size: $d=0.80$
- The Cohen’s d calculation is not provided in Python; we can calculate it manually.
- The function below will calculate the Cohen’s d measure for two samples of real-valued variables.

```
[18]: from numpy.random import seed
from numpy import mean
from numpy import var
from math import sqrt

def cohend(d1, d2):
    # calculate the size of samples
    n1, n2 = len(d1), len(d2)
    # calculate the variance of the samples
    s1, s2 = var(d1, ddof=1), var(d2, ddof=1)
    # calculate the pooled standard deviation
    s = sqrt(((n1 - 1) * s1 + (n2 - 1) * s2) / (n1 + n2 - 2))
    # calculate the means of the samples
    u1, u2 = mean(d1), mean(d2)
    # calculate the effect size
    return (u1 - u2) / s
```

Let us define a custom function *ttest*, which will compute *t*, *p*, and Cohen-*d*.

```
[21]: def ttest(a,b):
    t, p = ttest_ind(b, a, equal_var=False)
    print("ttest_ind:      t = %g  p = %g  Cohen-d = %g" % (t, p, cohend(b,a)))

ttest(out_noStar.L1_trig,out_Star.L1_trig)
```

```
ttest_ind:      t = 14.933  p = 1.41804e-45  Cohen-d = 0.936421
```

Notice a vanishing *p*-value ($\ll 0.001$) and a large effect size ($0.94 > 0.8$).

1.8 Looking into the Remaining Variables

- Let us look into Event Time.
- We observe only a weak effect (i.e., the detailed sensor data contain useful information)

```
[22]: ttest(out_noStar.ET,out_Star.ET)
```

```
ttest_ind:      t = 5.00656  p = 6.62822e-07  Cohen-d = 0.315858
```

1.8.1 Maximal Deviation, Turns, and SE

```
[28]: # MD_trig
ttest(out_noStar.MD_trig,out_Star.MD_trig)
# MD_rem
ttest(out_noStar.MD_rem,out_Star.MD_rem)
# flip_trig
ttest(out_noStar.flip_trig,out_Star.flip_trig)
# flip_rem
ttest(out_noStar.flip_rem,out_Star.flip_rem)
# SampleEntropy_trig
```



```
ttest(out_noStar.SE_trig,out_Star.SE_trig)
# SampleEntropy_rem
ttest(out_noStar.SE_rem,out_Star.SE_rem)
```

```
ttest_ind:      t = 107.842  p = 0    Cohen-d = 6.37573
ttest_ind:      t = -0.172357  p = 0.863191    Cohen-d = -0.0106349
ttest_ind:      t = 2.43822  p = 0.0149285    Cohen-d = 0.151461
ttest_ind:      t = 3.50638  p = 0.000474285    Cohen-d = 0.218847
ttest_ind:      t = -3.27666  p = 0.00108736    Cohen-d = -0.199558
ttest_ind:      t = -1.38832  p = 0.165344    Cohen-d = -0.0865236
```

1.8.2 Brief Comment on Significance

- We observe a strong effect in Maximal Deviation
- Surprisingly, we do not observe an effect in Sample Entropy

Remark. These results hold for any individual in the Prevent study.

1.9 Spearman Correlation of the Outcome Measures

As a first step, we ran nonparametric correlation analyses to evaluate the eventual degree of similarity between the entropy measures and the geometric measures.

Let us look into Sperman's correlations for all possible distinct pairs of measure.

```
[65]: df_normalized = out_df[(out_df.Correct == 1)].drop(['Correct', 'Star'], axis = 1)
      corr = df_normalized.corr(method='spearman')
      corr.style.background_gradient(cmap='coolwarm')
```

```
[65]: <pandas.io.formats.style.Styler at 0x1c284f2048>
```

Should we have defined L_1 -norm as $L_1^{\text{new}} = T \cdot L_1$, then 'ET' and 'L1_trig' would be highly correlated. This is expected.

```
[69]: print('New correlation between L1_trig and ET is %g.' %numpy.corrcoef(out_Star.
      ↪L1_trig*out_Star.ET, out_Star.ET)[0, 1])
```

New correlation between L1_trig and ET is 0.915592.

Take a look into Spearman's correlation with unnormalized L_1 -norms.

```
[70]: df_nonnormalized = out_df[(out_df.Correct == 1)].drop(['Correct', 'Star'], axis = 1)
      ↪1)
      df_nonnormalized.L1_trig = df_nonnormalized.L1_trig * df_nonnormalized.ET
      df_nonnormalized.L1_rem = df_nonnormalized.L1_rem * df_nonnormalized.ET

      corr = df_nonnormalized.corr(method='spearman')
      corr.style.background_gradient(cmap='coolwarm')
```

```
[70]: <pandas.io.formats.style.Styler at 0x1c1bb3fc88>
```

1.10 Observations

- A strong positive correlation between *Event Time* and *Reaction Time* (this is expected)
- A strong correlation between *L1_trig* and *ET* (this is by construction of L_1 -norm)
- A significant correlation between *Maximal Deviation of the nontriggering axis* (MD_rem) and *L1_rem* (the greater the amplitude of the nonleading (nontriggering) deviation (in the opposite direction from the target) the greater *L1_rem* norm)
- No significant correlation between geometric and entropic (Sample Entropy) measures (this might be due to not particularly well tuned parameters)

1.11 Conclusions

- There is a statistical difference between trials with Star and without Star cursor
- The observed difference is subtle
- In addition to tracking incorrect answers, we can also look into correct answers and compute the amount of spatial bias towards the competing alternatives
- A cross-population differences can be studied by averaging results (meta-analysis)