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https://github.com/qiaozihi9092/SJSU_baseball_analytics.git

Spin Rate for Scrimmages:

Kevin's solution for mean/variance of Spin Rate (I used R):

Subset data:

```
feb8scrim_reduced=feb8scrim[c("Pitcher","PitcherId","AutoPitchType","SpinRate")]
```

Group by pitcher and pitch type:

```
feb8_group=group_by(feb8scrim_complete,Pitcher,AutoPitchType)
```

Note: group_by() requires dplyr package

Find mean and variance of Spin Rate for each Pitcher/Pitch type:

```
summarise_at(feb8_group,"SpinRate",c(mean,var))
```

Output:

	<fct>	<fct>	<dbl>	<dbl>
1	Clark	ChangeUp	1504.	72240.
2	Clark	Curveball	2110.	14333.
3	Clark	Fastball	2145.	4838.
4	Clark	Slider	2288.	244.
5	Finn	Fastball	2171.	17396.
6	Finn	Sinker	1582.	18277.
7	Finn	Slider	2286.	313.
8	Mitchel, Andrew	ChangeUp	1847.	4404.
9	Mitchel, Andrew	Fastball	2027.	8718.
10	Mitchel, Andrew	Other	2271.	4750.
11	Mitchel, Andrew	Sinker	1908.	17.7
12	Mitchel, Andrew	Slider	2327.	1914.
13	Polack	ChangeUp	2109.	1266.
14	Polack	Fastball	2279.	3663.
15	Polack	Other	2228.	2711.
16	Polack	Slider	2300.	2136.
17	Wallace, Zach	ChangeUp	1713.	5096.
18	Wallace, Zach	Curveball	2090.	4784.
19	Wallace, Zach	Fastball	2133.	2876.
20	Wallace, Zach	Other	1995.	2819.

Note: This is only for the Feb. 8 Scrimmage

Sara's [solution](#) for mean & variance of spin rate

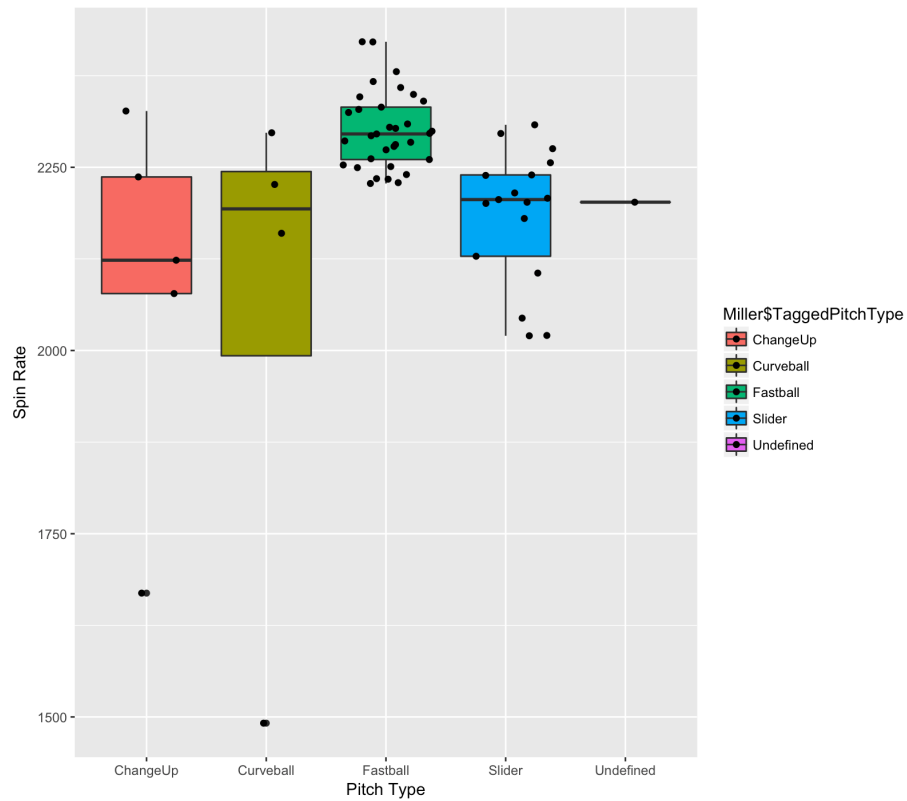
Comment [1]: I have checked Sara's solution, they are correct. My solution are posted at the end. Please check my code at github if interested (address posted above). Boxplot for each pitcher are also added.

2/8/18

Pitcher: **Miller**

- Fastball : Mean = 2300.4887 Variance = 2727.7849
- Slider: Mean = 2185.01572 Variance = 8286.8068
- ChangeUp: Mean = 2086.6991 Variance = 64028.2294
- Curveball: Mean = 2043.78976 Variance = 138688.0164
- Undefined: Mean = 2202.40368 Variance = 0

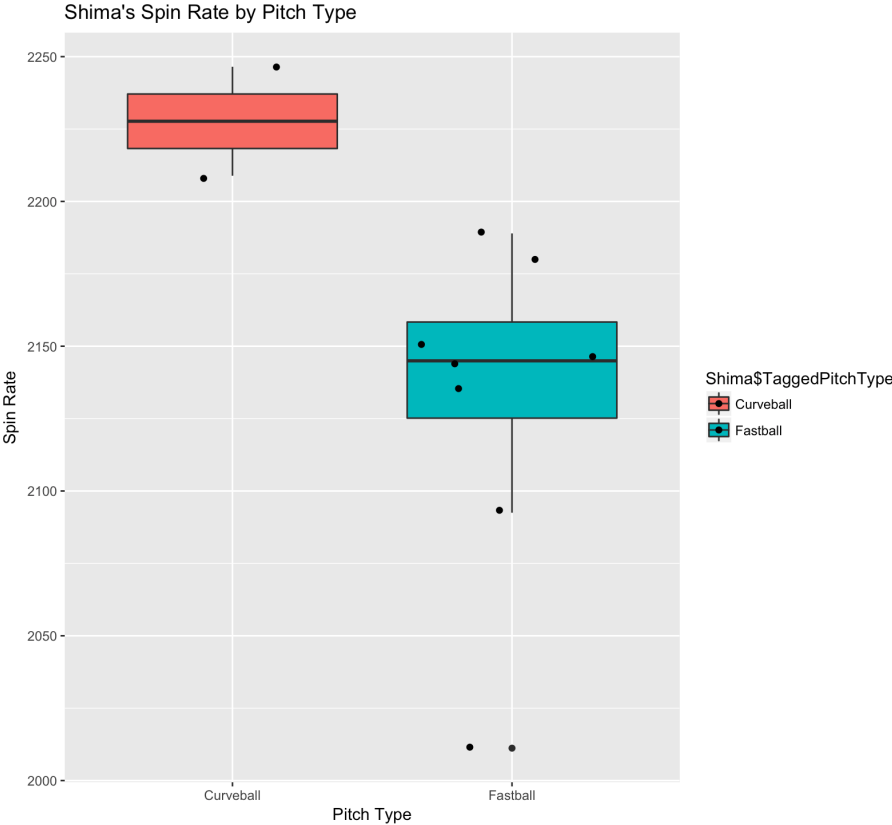
Miller's Spin Rate by Pitch Type



Comment [2]: Notice the boxplot shows the median for each pitch type, not the mean.

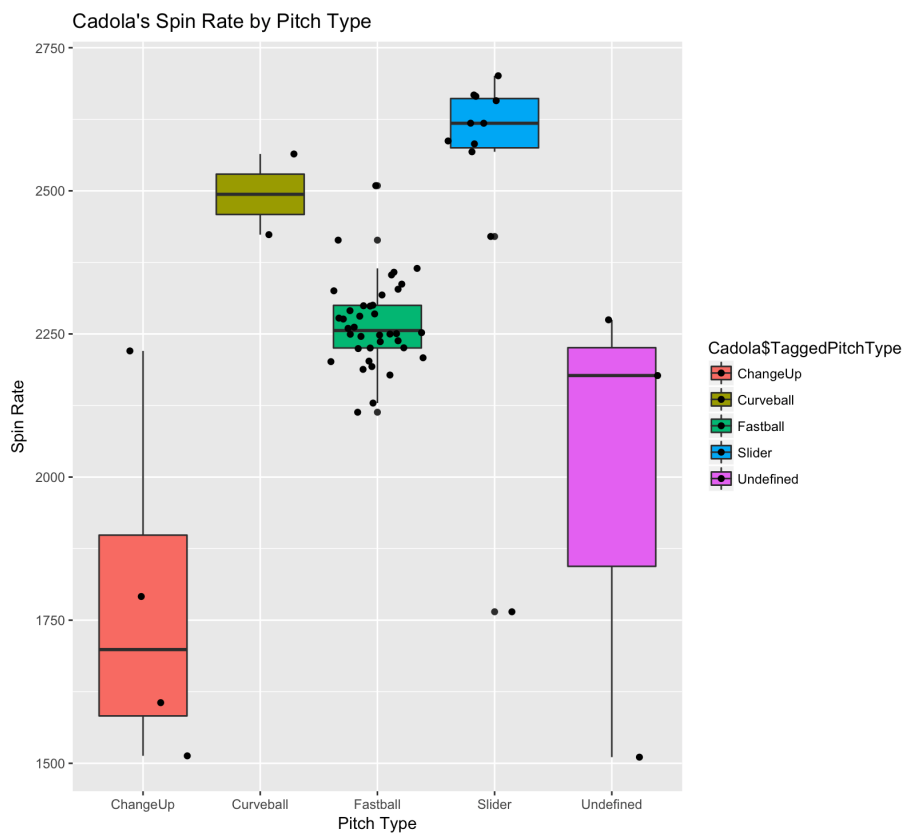
Pitcher: **Schima**

- Fastball: Mean = 2131.26333 Variance = 3209.9703
- Curveball: Mean = 2227.6896 Variance = 708.0974



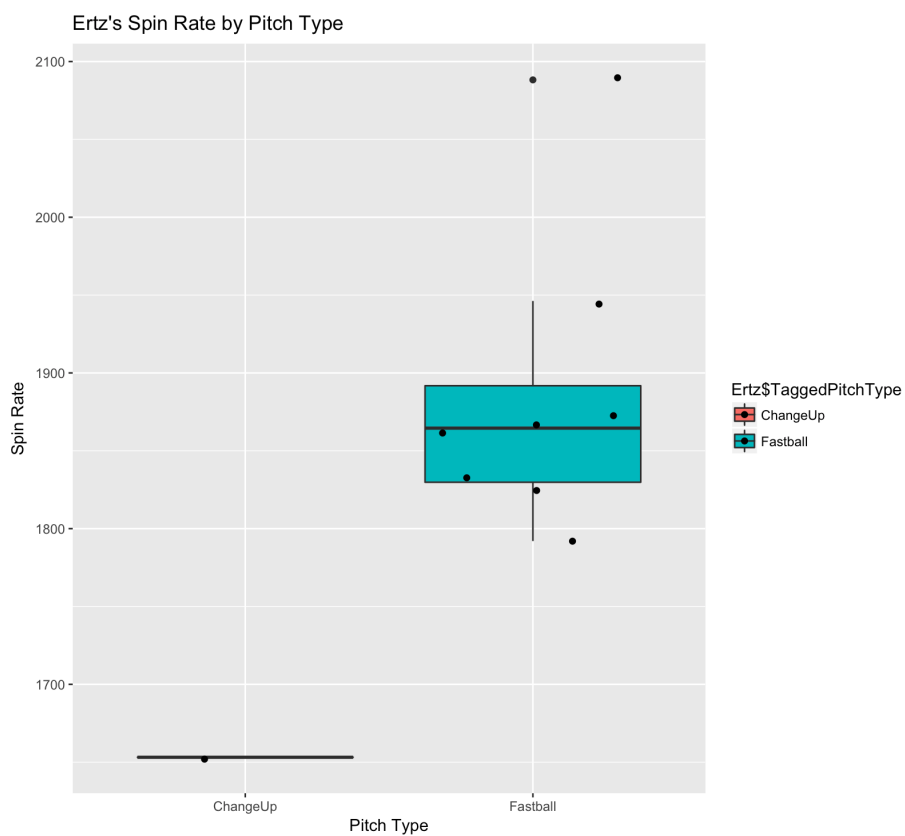
Pitcher: **Cadola**

- Changeup:	Mean = 1782.6913	Variance = 98519.1478
- Curveball:	Mean = 2493.9328	Variance = 9934.8664
- Fastball:	Mean = 2268.3467	Variance = 5605.1725
- Slider:	Mean = 2531.7733	Variance = 70323.5085
- Undefined:	Mean = 1987.5943	Variance = 172881.823



Pitcher: **Ertz**

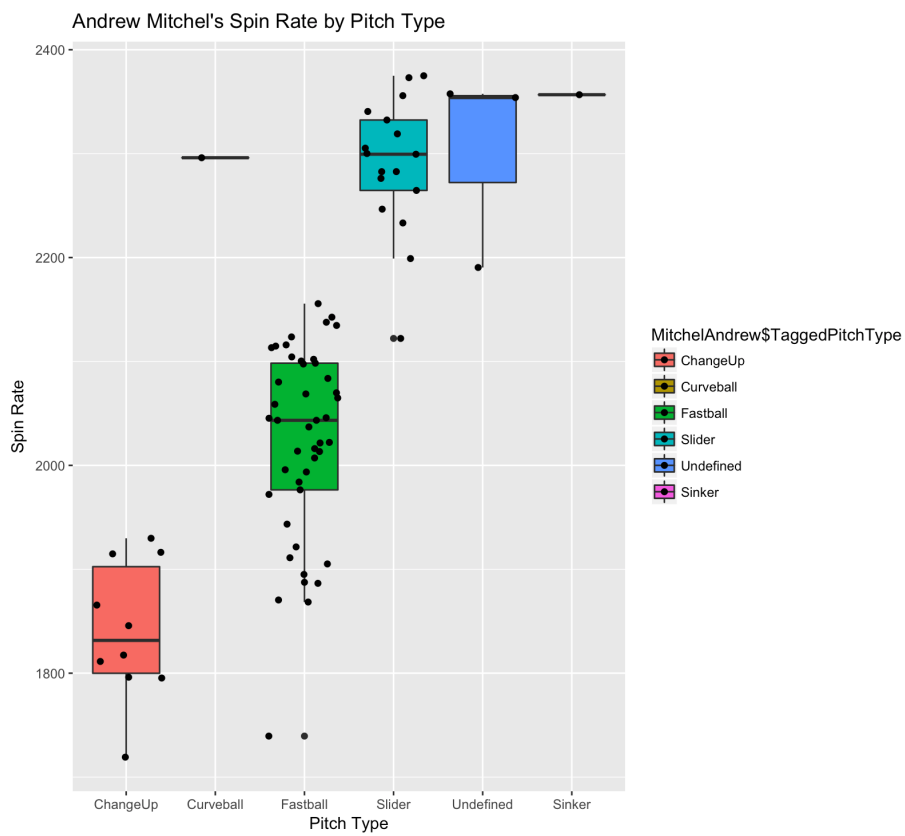
- Fastball: Mean = 1885.5144 Variance = 8764.2176
- ChangeUp: Mean = 1653.1613 Variance = 0



2/9/18

Pitcher: **Andrew Mitchel**

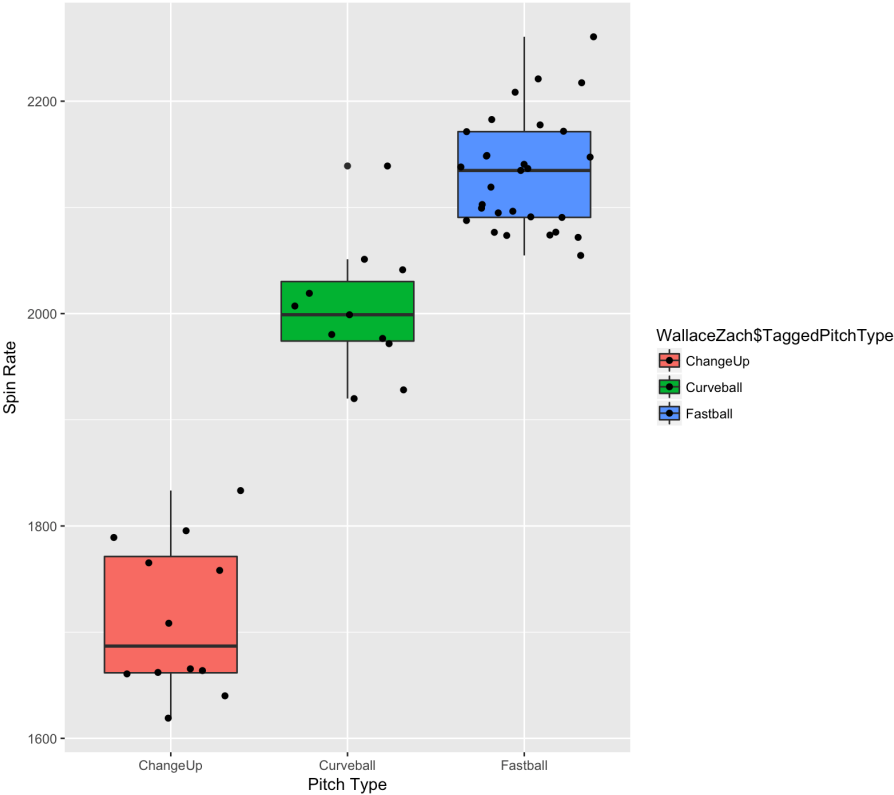
- Fastball: Mean = 2026.7661 Variance = 8717.7888
- Slider: Mean = 2327.1645 Variance = 1913.5813
- ChangeUp: Mean = 1847.0714 Variance = 4403.7558
- Other: Mean = 2270.6218 Variance = 4749.7183
- Sinker: Mean = 1908.1118 Variance = 17.6501



Pitcher: **Zach Wallace**

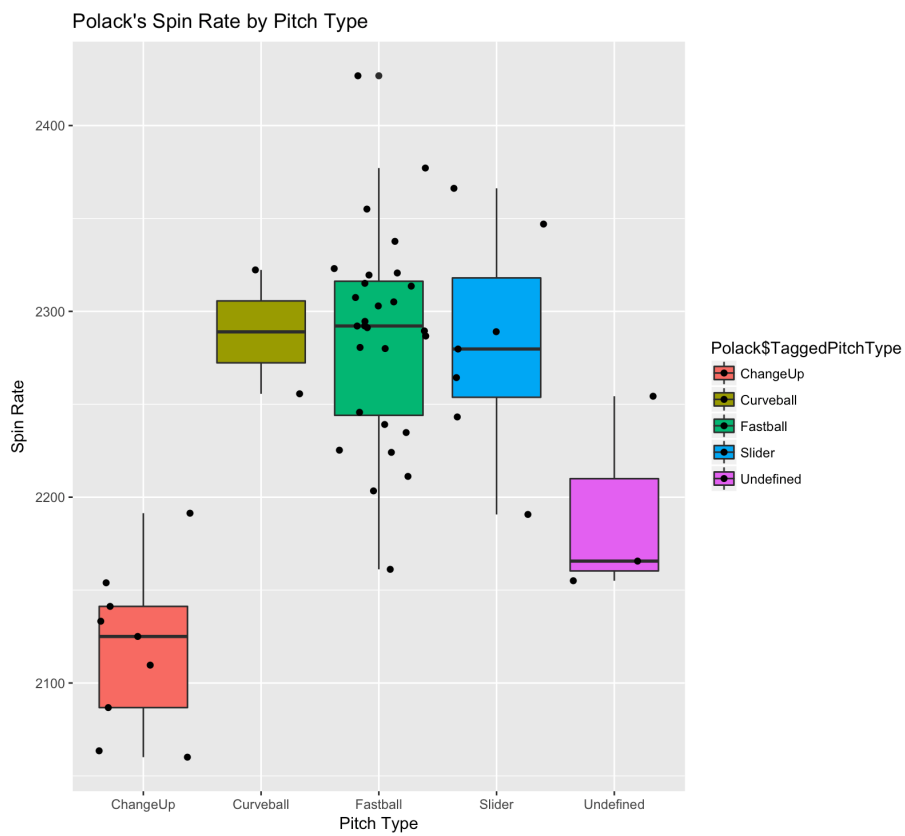
- | | | |
|--------------|------------------|----------------------|
| - Fastball: | Mean = 2132.7722 | Variance = 2876.0589 |
| - ChangeUp: | Mean = 1713.4062 | Variance = 5095.7468 |
| - Curveball: | Mean = 2090.1073 | Variance = 4783.6312 |
| - Other: | Mean = 1994.9356 | Variance = 2818.856 |

Zach Wallace's Spin Rate by Pitch Type



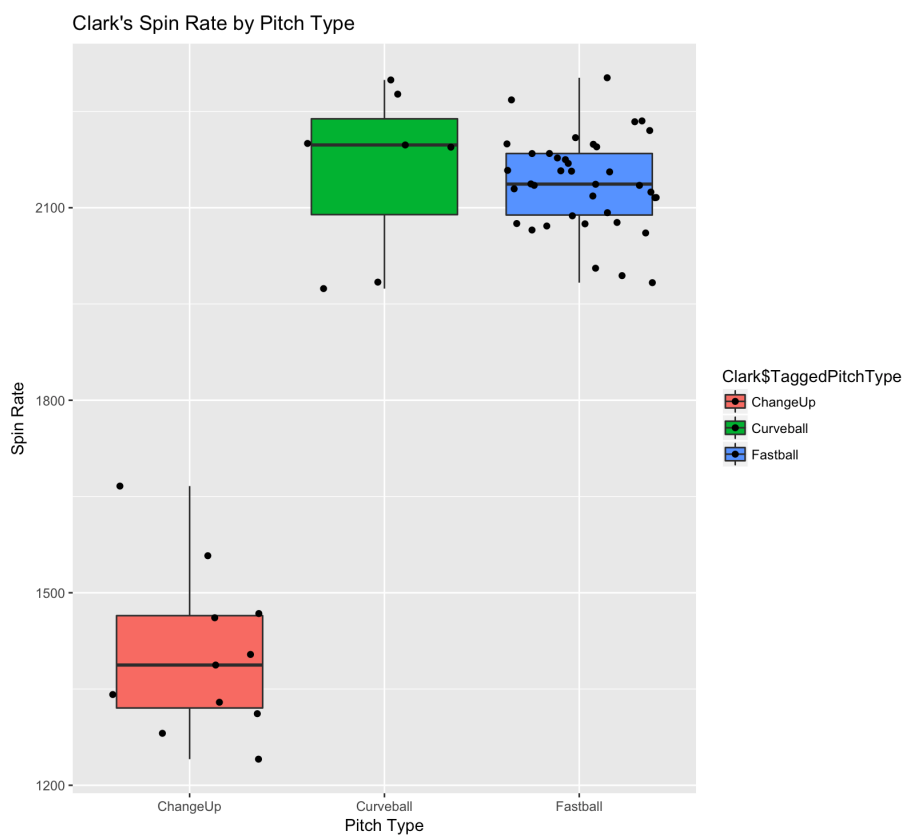
Pitcher: **Polack**

- ChangeUp:	Mean = 2109.1836	Variance = 1265.8083
- Fastball:	Mean = 2279.2383	Variance = 3663.1425
- Other:	Mean = 2227.5208	Variance = 2711.3057
- Slider:	Mean = 2300.4405	Variance = 2135.5497
- Undefined:	Mean = 2165.6013	Variance = 0



Pitcher: **Clark**

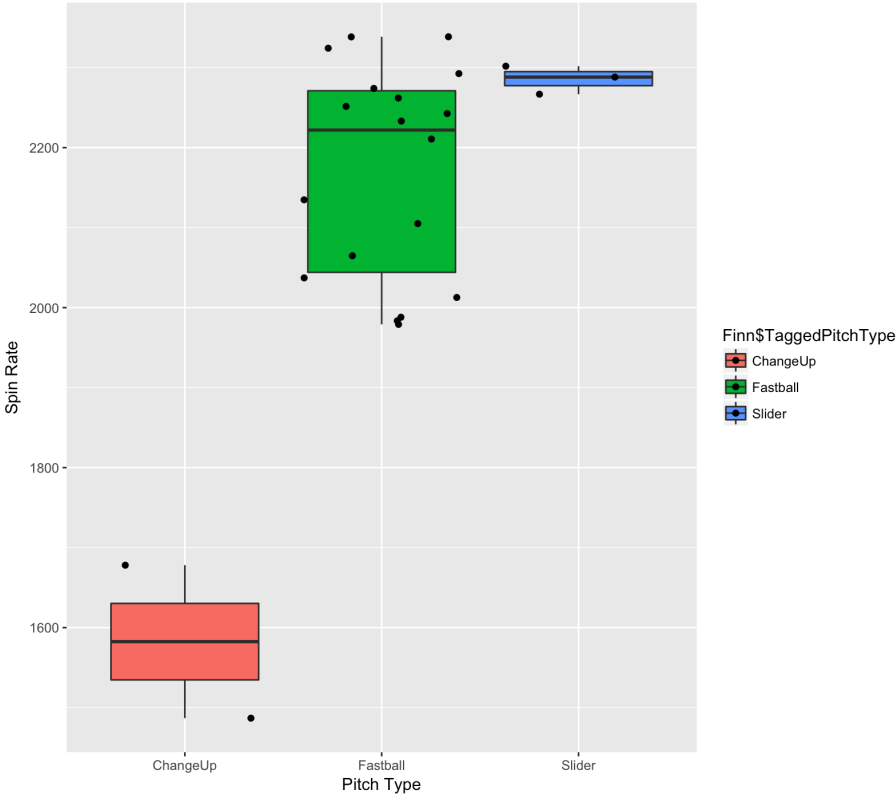
- Fastball: Mean = 2144.9727 Variance = 4837.8424
- ChangeUp: Mean = 1503.5269 Variance = 72240.1081
- Curveball: Mean = 2110.1065 Variance = 14333.046
- Slider: Mean = 2288.0794 Variance = 244.0094



Pitcher: **Finn**

- Fastball: Mean = 2170.7407 Variance = 17396.0272
- Sinker: Mean = 1582.4617 Variance = 18277.3365
- Slider: Mean = 2285.5771 Variance = 312.7274

Finn's Spin Rate by Pitch Type



	Pitcher	TaggedPitchType	mean	variance					
					22	Mitchel, Andrew	ChangeUp	1841.156	4446.3437
1	Cadola	ChangeUp	1782.691	98519.1198	23	Mitchel, Andrew	Curveball	2296.052	NA
2	Cadola	Curveball	2493.933	9934.8633	24	Mitchel, Andrew	Fastball	2022.807	8446.0349
3	Cadola	Fastball	2268.347	5605.1775	25	Mitchel, Andrew	Slider	2288.697	4158.4397
4	Cadola	Slider	2531.773	70323.5290	26	Mitchel, Andrew	Undefined	2300.651	9113.5231
5	Cadola	Undefined	1987.594	172881.7913	27	Mitchel, Andrew	Sinker	2356.708	NA
6	Ertz	ChangeUp	1653.161	NA	28	Polack	ChangeUp	2118.318	1858.5128
7	Ertz	Fastball	1885.514	8764.2115	29	Polack	Curveball	2288.963	2221.6841
8	Miller	ChangeUp	2086.699	64028.2394	30	Polack	Fastball	2287.702	3115.6447
9	Miller	Curveball	2043.790	138687.9970	31	Polack	Slider	2282.886	3586.1169
10	Miller	Fastball	2300.489	2727.7856	32	Polack	Undefined	2191.651	2974.2278
11	Miller	Slider	2185.016	8286.8014	33	Wallace, Zach	ChangeUp	1713.406	5095.7418
12	Miller	Undefined	2202.404	NA	34	Wallace, Zach	Curveball	2003.017	3725.8507
13	Shima	Curveball	2227.690	708.0948	35	Wallace, Zach	Fastball	2131.517	2818.9983
14	Shima	Fastball	2131.263	3209.9679					
15		Undefined	2296.472	NA					
16	Clark	ChangeUp	1404.348	15983.2069					
17	Clark	Curveball	2160.956	17137.5523					
18	Clark	Fastball	2139.922	5149.1563					
19	Finn	ChangeUp	1582.462	18277.3371					
20	Finn	Fastball	2170.741	17396.0161					
21	Finn	Slider	2285.577	312.7260					

Xiaoyue's solution :)

<https://gist.github.com/XiaoyueZhong/6c863ac8ff916994ab66ea8a7f421e3b>

2.8.19 mean and var

SpinRate			SpinRate		
Pitcher	TaggedPitchType		Pitcher	TaggedPitchType	
Clark	ChangeUp	1404.348176	Clark	ChangeUp	15983.206915
	Curveball	2160.955875		Curveball	17137.552289
	Fastball	2139.922039		Fastball	5149.156311
Finn	ChangeUp	1582.461716	Finn	ChangeUp	18277.337077
	Fastball	2170.740734		Fastball	17396.016117
	Slider	2285.577134		Slider	312.725954
Mitchel, Andrew	ChangeUp	1841.156310	Mitchel, Andrew	ChangeUp	4446.343744
	Curveball	2296.052060		Curveball	NaN
	Fastball	2022.807022		Fastball	8446.034880
	Sinker	2356.708201		Sinker	NaN
	Slider	2288.697128		Slider	4158.439658
Polack	Undefined	2300.650564	Polack	Undefined	9113.523072
	ChangeUp	2118.317926		ChangeUp	1858.512829
	Curveball	2288.962550		Curveball	2221.684144
	Fastball	2287.701547		Fastball	3115.644746
	Slider	2282.885682		Slider	3586.116934
Wallace, Zach	Undefined	2191.651074		Undefined	2974.227844
	ChangeUp	1713.406209	Wallace, Zach	ChangeUp	5095.741775
	Curveball	2003.016958		Curveball	3725.850730
	Fastball	2131.517449		Fastball	2818.998262

2.9.19 mean and var

10]:

Pitcher	TaggedPitchType	SpinRate
Cadola	ChangeUp	1782.691331
	Curveball	2493.932797
	Fastball	2268.346687
	Slider	2531.773296
	Undefined	1987.594266
Ertz	ChangeUp	1653.161258
	Fastball	1885.514446
Miller	ChangeUp	2086.699069
	Curveball	2043.789760
	Fastball	2300.488722
	Slider	2185.015720
	Undefined	2202.403681
Shima	Curveball	2227.689573
	Fastball	2131.263335

Pitcher	TaggedPitchType	SpinRate
Cadola	ChangeUp	98519.119840
	Curveball	9934.863337
	Fastball	5605.177476
	Slider	70323.529015
	Undefined	172881.791295
Ertz	ChangeUp	NaN
	Fastball	8764.211524
Miller	ChangeUp	64028.239368
	Curveball	138687.997039
	Fastball	2727.785630
	Slider	8286.801371
	Undefined	NaN
Shima	Curveball	708.094813
	Fastball	3209.967875