

Data Sciences

computing the future



Liquid Assets

Flight 1:

Number of Judges = 24

Number of Wines = 6

Placement	Label	Wine
1st	WineB	Earthquake
2nd	WineF	Velvet Devil
3rd	WineA	Murdoch James
4th	WineD	Adelshcein
5th	WineC	Robert Mondavi
6th	WineE	Nobile Di Montepol

Details: some summary data

	Wine	Label	Average	Median	Sum	Scores	OrdinalRank
Placement							
1st	Earthquake	WineB	2	2	48	[3, 2, 3, 1, 1, 4, 1, 5, 1, 1, 1, 2, 3, 2, ...]	1
2nd	Velvet Devil	WineF	2.8	2	66	[1, 4, 1, 5, 5, 1, 2, 1, 3, 4, 2, 6, 1, 6, 1, ...]	2
3rd	Murdoch James	WineA	3.5	3	83	[4, 5, 6, 2, 6, 2, 3, 2, 5, 2, 3, 2, 3, 2, 5, ...]	3
4th	Adelshcein	WineD	4.1	4	98	[6, 6, 5, 3, 2, 3, 6, 4, 4, 5, 4, 3, 5, 4, 4, ...]	4
5th	Robert Mondavi	WineC	4.2	4	100	[5, 1, 4, 4, 4, 6, 4, 3, 6, 6, 6, 5, 4, 1, 3, ...]	5
6th	Nobile Di Montepol	WineE	4.5	5	109	[2, 3, 2, 6, 3, 5, 5, 6, 2, 3, 5, 4, 6, 5, 6, ...]	6

Descriptive Details

	name	Region	Varietal	Year	Price	Label	Average	OrdinalRank
0	Murdoch James	New Zealand	Pinot Noir	2013	24	WineA	3.5	3
1	Earthquake	Lodi, CA	Zinfandel	2013	25	WineB	2	1
2	Robert Mondavi	Oakville Napa, CA	Cabernet Sauvingon	2014	25	WineC	4.2	5
3	Adelshcein	Willamette Valley, CA	Pinot Noir	2014	25	WineD	4.1	4
4	Nobile Di Montepol	Italy	Sangiovese	2011	29	WineE	4.5	6
5	Velvet Devil	Washington State	Merlot	2014	14	WineF	2.8	2

The Judge's Rankings:

wine	WineA	WineB	WineC	WineD	WineE	WineF
user						
Alan	2	5	3	4	6	1
Allison	5	2	1	6	3	4
Brian	2	1	6	5	3	4
Christel	2	1	5	3	4	6
Dean	5	2	3	4	6	1
Emily	2	1	4	3	6	5
Francisco	3	2	4	5	6	1
Grace	6	1	4	2	3	5
Henry	2	3	1	4	5	6
Jeff	3	2	5	6	4	1
Jess	3	1	6	4	5	2
Jesse H.	5	3	2	6	4	1
Jiyoung	3	1	4	6	5	2
Johannes	4	3	5	6	2	1
John B.	5	1	6	4	2	3
John C.	6	2	5	1	3	4
Kathryn	4	3	6	1	5	2
Katie	2	4	6	3	5	1
Nayad	1	2	4	3	6	5
Nick	4	2	3	5	6	1
Rama	6	3	4	5	2	1
Rebekah	3	1	4	5	6	2
Smita	3	1	5	4	6	2
Xiaoying	2	1	4	3	6	5

Table of Votes Against:

wine	WineB	WineF	WineA	WineD	WineC	WineE
Votes Against	48	66	83	98	100	109
Group Rank	1	2	3	4	5	6

(24 is the best possible, 576 is the worst)

Rank Correlation

The [Friedman Test](#) was used to measure correlation in the preferences of the judges

$$SS_e = \frac{1}{n(k-1)} \sum_{i=1}^n \sum_{j=1}^k (r_{ij} - \bar{r})^2$$

$$SSe = 32.119047619$$

[Kendall's W](#) is a normalization of the Friedman statistic between 0 and 1.

$$W = 0.267658730159$$

The probability that random chance could be responsible for this correlation is
5.62731025068e-06

Finally, when n or k is large (i.e. n > 15 or k > 4), the probability distribution of Q can be approximated by that of a chi-squared distribution. In this case the p-value is given by $\{displaystyle \mathbf{P}(\chi_{\{k-1\}}^2 \geq Q)\}$. If n or k is small, the approximation to chi-square becomes poor and the p-value should be obtained from tables of Q specially prepared for the Friedman test. If the p-value is significant, appropriate post-hoc multiple comparisons tests would be performed.

Correlation Between the Ranks of Each Person With the Average Ranking of Others

Contrary to the Spearman correlation, the Kendall correlation is not affected by how far from each other ranks are but only by whether the ranks between observations are equal or not, and is thus only appropriate for discrete variables but not defined for continuous variables.

Values close to 1 indicate strong agreement, values close to -1 indicate strong disagreement.

	Correspondance	p-value
user		
Smita	1.00	0.004832
Rebekah	0.87	0.014595
Jess	0.87	0.014595
Jiyoung	0.73	0.038778
Francisco	0.73	0.038778
Nick	0.60	0.090874
Xiaoying	0.60	0.090874
Emily	0.60	0.090874
Dean	0.47	0.188486
Jeff	0.47	0.188486
Brian	0.47	0.188486
Katie	0.47	0.188486
Nayad	0.47	0.188486
Alan	0.33	0.347558
John B.	0.33	0.347558
Christel	0.33	0.347558
Kathryn	0.33	0.347558
Jesse H.	0.20	0.573025
Johannes	0.20	0.573025
Grace	0.07	0.850981
Allison	0.07	0.850981
John C.	0.07	0.850981
Rama	-0.07	0.850981
Henry	-0.07	0.850981

Pairwise Rank Correlations

Who has a similar Palate?

		KendallTau	pvalue_KT	significant
judge1	judge2			
Alan	Brian	-0.200000	0.573025	None
	Christel	-0.333333	0.347558	None
	Dean	0.333333	0.347558	None
	Emily	-0.066667	0.850981	None
	Francisco	0.600000	0.090874	None
	Henry	0.066667	0.850981	None
	Jeff	0.333333	0.347558	None
	Jess	0.200000	0.573025	None
	Jesse H.	0.333333	0.347558	None
	John B.	-0.333333	0.347558	None
	John C.	-0.333333	0.347558	None
	Kathryn	0.200000	0.573025	None
	Nayad	0.066667	0.850981	None
Allison	Nick	0.466667	0.188486	None
	Rebekah	0.466667	0.188486	None
	Smita	0.333333	0.347558	None
	Alan	-0.066667	0.850981	None
	Brian	0.066667	0.850981	None
	Christel	-0.066667	0.850981	None
	Dean	0.066667	0.850981	None
	Emily	-0.066667	0.850981	None
	Francisco	0.066667	0.850981	None
	Grace	0.200000	0.573025	None
	Henry	0.333333	0.347558	None
	Jeff	0.066667	0.850981	None
	Jess	-0.066667	0.850981	None
Rama	Jesse H.	0.600000	0.090874	None
	Jiyoung	0.333333	0.347558	None
	John B.	0.200000	0.573025	None
	John C.	-0.066667	0.850981	None
	Kathryn	-0.600000	0.090874	None
	Katie	-0.466667	0.188486	None
	Nayad	-0.200000	0.573025	None
	Nick	0.200000	0.573025	None
	Rama	0.066667	0.850981	None

		KendallTau	pvalue_KT	significant
judge1	judge2			
	Rebekah	0.200000	0.573025	None
	Smita	0.066667	0.850981	None
	Xiaoying	-0.066667	0.850981	None
	Christel	0.600000	0.090874	None
	Dean	-0.066667	0.850981	None
	Emily	0.333333	0.347558	None
	Francisco	0.200000	0.573025	None
	Henry	-0.066667	0.850981	None
	Jeff	0.466667	0.188486	None
	Jess	0.600000	0.090874	None
Brian	Jesse H.	-0.066667	0.850981	None
	John C.	0.066667	0.850981	None
	Kathryn	0.066667	0.850981	None
	Nayad	0.200000	0.573025	None
	Nick	0.066667	0.850981	None
	Rebekah	0.333333	0.347558	None
	Smita	0.466667	0.188486	None
	Dean	-0.200000	0.573025	None
	Emily	0.733333	0.038778	Significant
	Francisco	0.066667	0.850981	None
	Henry	0.333333	0.347558	None
	Jeff	0.066667	0.850981	None
Christel	Jesse H.	-0.466667	0.188486	None
	John C.	0.200000	0.573025	None
	Kathryn	0.200000	0.573025	None
	Nayad	0.600000	0.090874	None
	Nick	-0.066667	0.850981	None
	Rebekah	0.200000	0.573025	None
	Smita	0.333333	0.347558	None
	Emily	0.066667	0.850981	None
	Jeff	0.466667	0.188486	None
	Jesse H.	0.466667	0.188486	None
	John C.	0.066667	0.850981	None
Dean	Kathryn	0.333333	0.347558	None
	Nayad	-0.066667	0.850981	None
	Nick	0.866667	0.014595	Significant
	Rebekah	0.600000	0.090874	None
	Smita	0.466667	0.188486	None
Emily	Nick	0.200000	0.573025	None

		KendallTau	pvalue_KT	significant
judge1	judge2			
Francisco	Rebekah	0.466667	0.188486	None
	Dean	0.733333	0.038778	Significant
	Emily	0.333333	0.347558	None
	Henry	-0.066667	0.850981	None
	Jeff	0.733333	0.038778	Significant
	Jesse H.	0.466667	0.188486	None
	John C.	-0.200000	0.573025	None
	Kathryn	0.333333	0.347558	None
	Nayad	0.200000	0.573025	None
	Nick	0.866667	0.014595	Significant
Grace	Rebekah	0.866667	0.014595	Significant
	Smita	0.733333	0.038778	Significant
	Alan	-0.600000	0.090874	None
	Brian	0.066667	0.850981	None
	Christel	0.466667	0.188486	None
	Dean	0.066667	0.850981	None
	Emily	0.200000	0.573025	None
	Francisco	-0.200000	0.573025	None
	Henry	0.066667	0.850981	None
	Jeff	-0.200000	0.573025	None
Henry	Jess	0.200000	0.573025	None
	Jesse H.	-0.200000	0.573025	None
	Jiyoung	-0.200000	0.573025	None
	John B.	0.466667	0.188486	None
	John C.	0.733333	0.038778	Significant
	Kathryn	0.200000	0.573025	None
	Katie	-0.200000	0.573025	None
	Nayad	0.066667	0.850981	None
	Nick	-0.066667	0.850981	None
	Rebekah	-0.066667	0.850981	None
Nick	Smita	0.066667	0.850981	None
	Dean	-0.066667	0.850981	None
	Emily	0.333333	0.347558	None
	Jeff	-0.333333	0.347558	None
	Jesse H.	-0.066667	0.850981	None
	John C.	-0.200000	0.573025	None
	Kathryn	-0.466667	0.188486	None
	Nayad	0.466667	0.188486	None
Nick	Nick	0.066667	0.850981	None

		KendallTau	pvalue_KT	significant
judge1	judge2			
Jeff	Rebekah	0.066667	0.850981	None
	Smita	-0.066667	0.850981	None
	Emily	0.066667	0.850981	None
	Jesse H.	0.466667	0.188486	None
	Kathryn	0.333333	0.347558	None
	Nayad	-0.066667	0.850981	None
	Nick	0.600000	0.090874	None
	Rebekah	0.600000	0.090874	None
	Christel	0.466667	0.188486	None
	Dean	0.333333	0.347558	None
Jess	Emily	0.466667	0.188486	None
	Francisco	0.600000	0.090874	None
	Henry	-0.200000	0.573025	None
	Jeff	0.600000	0.090874	None
	Jesse H.	0.066667	0.850981	None
	John C.	0.200000	0.573025	None
	Kathryn	0.466667	0.188486	None
	Nayad	0.333333	0.347558	None
	Nick	0.466667	0.188486	None
	Rebekah	0.733333	0.038778	Significant
Jesse H.	Smita	0.866667	0.014595	Significant
	Emily	-0.200000	0.573025	None
	Kathryn	-0.200000	0.573025	None
	Nayad	-0.333333	0.347558	None
	Nick	0.600000	0.090874	None
	Rebekah	0.333333	0.347558	None
	Alan	0.333333	0.347558	None
	Brian	0.466667	0.188486	None
	Christel	0.066667	0.850981	None
	Dean	0.466667	0.188486	None
Jiyoung	Emily	0.333333	0.347558	None
	Francisco	0.733333	0.038778	Significant
	Henry	-0.066667	0.850981	None
	Jeff	0.733333	0.038778	Significant
	Jess	0.600000	0.090874	None
	Jesse H.	0.466667	0.188486	None
	John B.	0.333333	0.347558	None
	John C.	-0.200000	0.573025	None
	Kathryn	0.066667	0.850981	None

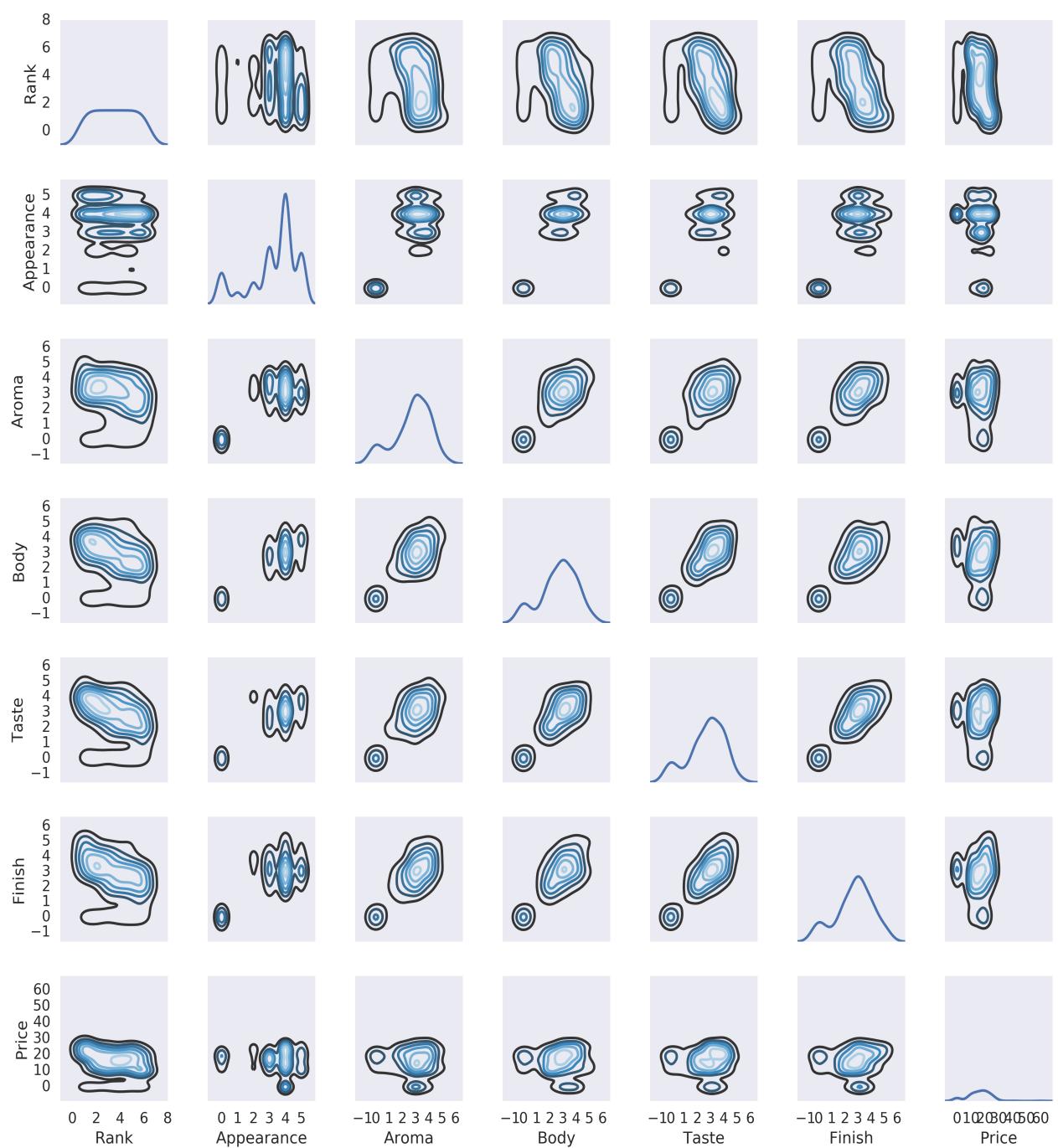
		KendallTau	pvalue_KT	significant
judge1	judge2			
	Nayad	0.200000	0.573025	None
	Nick	0.600000	0.090874	None
	Rebekah	0.866667	0.014595	Significant
	Smita	0.733333	0.038778	Significant
	Alan	0.066667	0.850981	None
	Allison	0.066667	0.850981	None
	Brian	0.200000	0.573025	None
	Christel	-0.200000	0.573025	None
	Dean	0.200000	0.573025	None
	Emily	-0.200000	0.573025	None
	Francisco	0.466667	0.188486	None
	Grace	-0.200000	0.573025	None
	Henry	-0.600000	0.090874	None
	Jeff	0.733333	0.038778	Significant
	Jess	0.333333	0.347558	None
Johannes	Jesse H.	0.466667	0.188486	None
	Jiyoung	0.466667	0.188486	None
	John B.	0.333333	0.347558	None
	John C.	-0.200000	0.573025	None
	Kathryn	0.066667	0.850981	None
	Katie	0.200000	0.573025	None
	Nayad	-0.333333	0.347558	None
	Nick	0.333333	0.347558	None
	Rama	0.733333	0.038778	Significant
	Rebekah	0.333333	0.347558	None
	Smita	0.200000	0.573025	None
	Xiaoying	-0.200000	0.573025	None
John B.	Brian	0.600000	0.090874	None
	Christel	0.200000	0.573025	None
	Dean	0.066667	0.850981	None
	Emily	-0.066667	0.850981	None
	Francisco	0.066667	0.850981	None
	Henry	-0.466667	0.188486	None
	Jeff	0.333333	0.347558	None
	Jess	0.466667	0.188486	None
	Jesse H.	0.066667	0.850981	None
	John C.	0.466667	0.188486	None
	Kathryn	0.200000	0.573025	None
	Nayad	-0.200000	0.573025	None

		KendallTau	pvalue_KT	significant
judge1	judge2			
John C.	Nick	-0.066667	0.850981	None
	Rebekah	0.200000	0.573025	None
	Smita	0.333333	0.347558	None
	Emily	-0.066667	0.850981	None
	Jeff	-0.200000	0.573025	None
	Jesse H.	-0.200000	0.573025	None
	Kathryn	0.466667	0.188486	None
	Nayad	-0.200000	0.573025	None
	Nick	-0.066667	0.850981	None
	Rebekah	-0.066667	0.850981	None
Kathryn	Emily	0.200000	0.573025	None
	Nayad	0.066667	0.850981	None
	Nick	0.200000	0.573025	None
	Rebekah	0.200000	0.573025	None
	Alan	0.600000	0.090874	None
	Brian	0.200000	0.573025	None
	Christel	0.066667	0.850981	None
	Dean	0.200000	0.573025	None
	Emily	0.066667	0.850981	None
	Francisco	0.466667	0.188486	None
Katie	Henry	-0.333333	0.347558	None
	Jeff	0.466667	0.188486	None
	Jess	0.600000	0.090874	None
	Jesse H.	-0.066667	0.850981	None
	Jiyoung	0.200000	0.573025	None
	John B.	0.066667	0.850981	None
	John C.	0.066667	0.850981	None
	Kathryn	0.600000	0.090874	None
	Nayad	0.200000	0.573025	None
	Nick	0.333333	0.347558	None
Nayad	Rebekah	0.333333	0.347558	None
	Smita	0.466667	0.188486	None
Rama	Emily	0.866667	0.014595	Significant
	Nick	0.066667	0.850981	None
	Rebekah	0.333333	0.347558	None
	Alan	-0.200000	0.573025	None
	Brian	-0.066667	0.850981	None
	Christel	-0.466667	0.188486	None
	Dean	0.466667	0.188486	None

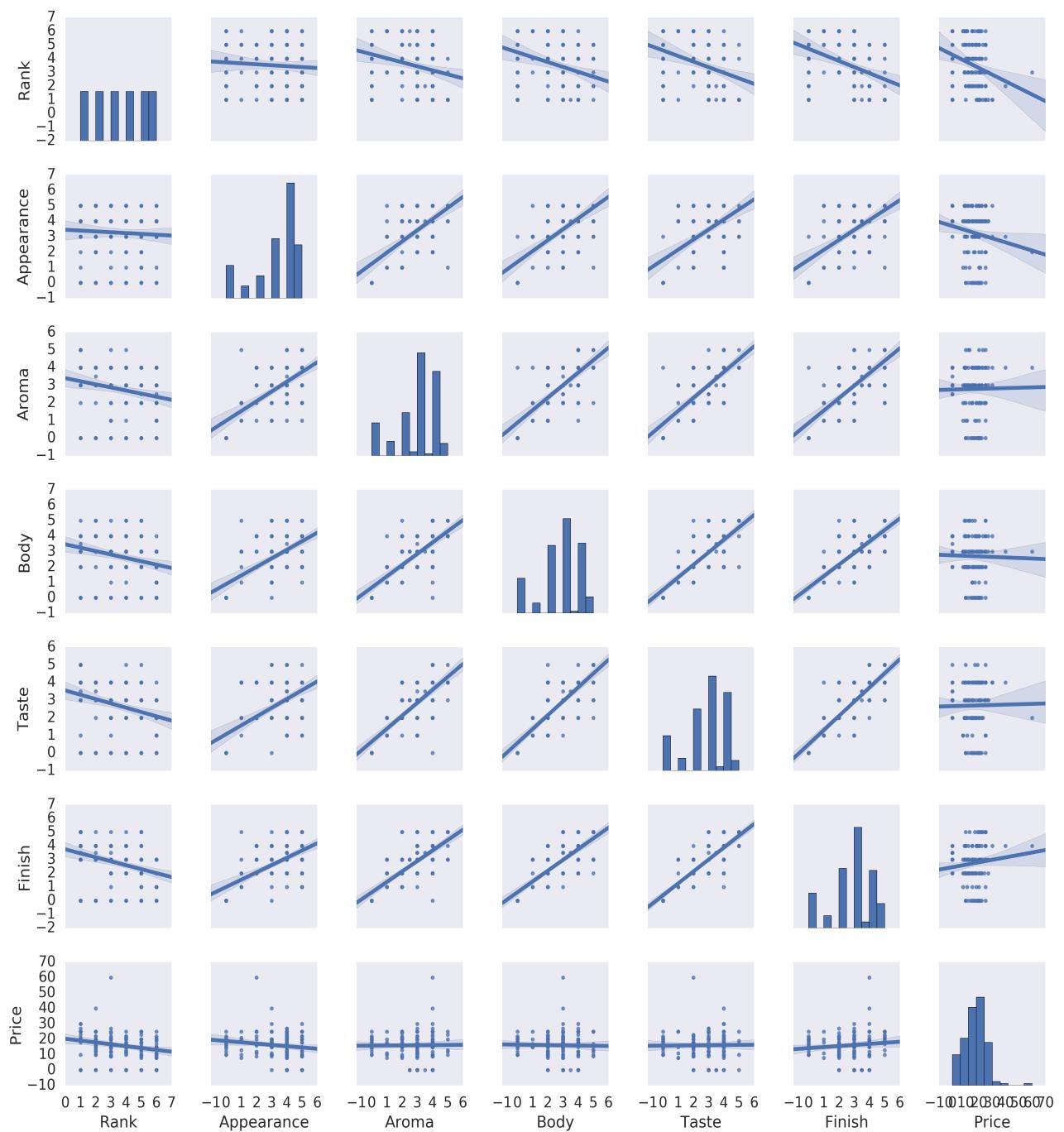
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judge1	judge2			
	Emily	-0.466667	0.188486	None
	Francisco	0.200000	0.573025	None
	Grace	0.066667	0.850981	None
	Henry	-0.600000	0.090874	None
	Jeff	0.466667	0.188486	None
	Jess	0.066667	0.850981	None
	Jesse H.	0.466667	0.188486	None
	Jiyoung	0.200000	0.573025	None
	John B.	0.333333	0.347558	None
	John C.	0.066667	0.850981	None
	Kathryn	0.066667	0.850981	None
	Katie	-0.066667	0.850981	None
	Nayad	-0.600000	0.090874	None
	Nick	0.333333	0.347558	None
	Rebekah	0.066667	0.850981	None
	Smita	-0.066667	0.850981	None
	Xiaoying	-0.466667	0.188486	None
Rebekah	Nick	0.733333	0.038778	Significant
	Emily	0.600000	0.090874	None
	Jeff	0.466667	0.188486	None
	Jesse H.	0.200000	0.573025	None
Smita	John C.	0.066667	0.850981	None
	Kathryn	0.333333	0.347558	None
	Nayad	0.466667	0.188486	None
	Nick	0.600000	0.090874	None
	Rebekah	0.866667	0.014595	Significant
Xiaoying	Alan	-0.066667	0.850981	None
	Brian	0.333333	0.347558	None
	Christel	0.733333	0.038778	Significant
	Dean	0.066667	0.850981	None
	Emily	1.000000	0.004832	Significant
	Francisco	0.333333	0.347558	None
	Grace	0.200000	0.573025	None
	Henry	0.333333	0.347558	None
	Jeff	0.066667	0.850981	None
	Jess	0.466667	0.188486	None
	Jesse H.	-0.200000	0.573025	None
	Jiyoung	0.333333	0.347558	None
	John B.	-0.066667	0.850981	None

		KendallTau	pvalue_KT	significant
judge1	judge2			
	John C.	-0.066667	0.850981	None
	Kathryn	0.200000	0.573025	None
	Katie	0.066667	0.850981	None
	Nayad	0.866667	0.014595	Significant
	Nick	0.200000	0.573025	None
	Rebekah	0.466667	0.188486	None
	Smita	0.600000	0.090874	None

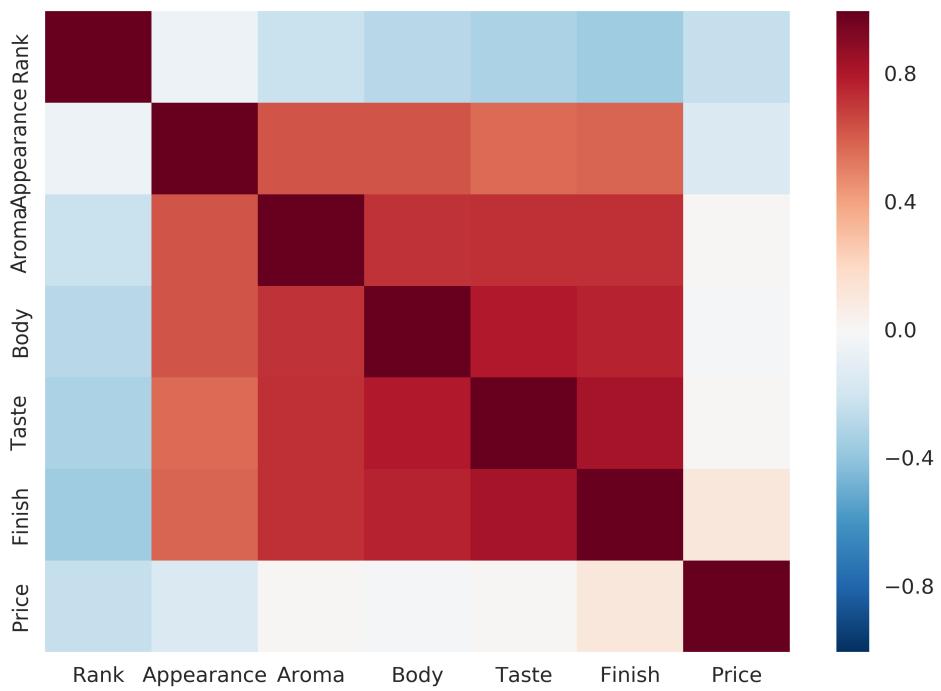
Feature Correlation KDE plot



Pairwise Rank Correlations

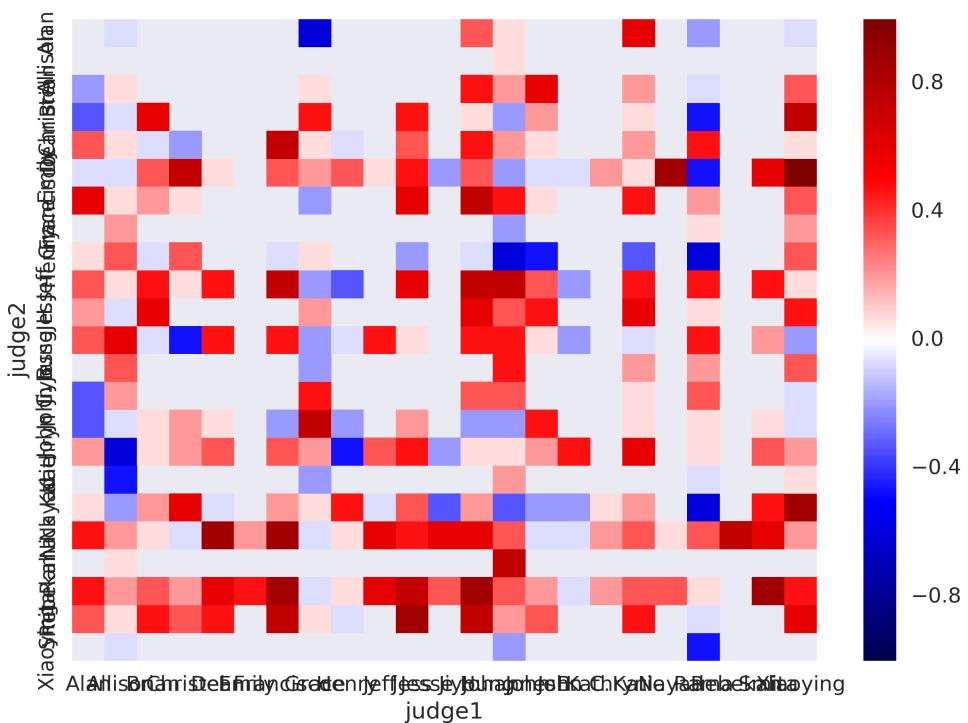


HeatMap



Pairwise Correlation Heat Map

Great Minds Think Alike



Simulated Results

Do we do better than random simulation?

		Average	Median	Sum
Wine	wine			
Robert Mondavi	WineC	3.2	3	76
Nobile Di Montepol	WineE	3.2	2.5	76
Earthquake	WineB	3.4	3	82
Velvet Devil	WineF	3.5	3.5	83
Murdoch James	WineA	3.8	4	92
Adelshchein	WineD	4	4	95

