

This chart is meant to help explain the significance that the range of raw scores has on the normalization of those scores and the overall evaluation of the projects. The normalized value represents how many standard deviations the score is off the mean. The notes at the bottom point out some significant differences resulting from disparate ranges on a category with 11 projects, 5 judges where every project is judged 3 times.

	Project 1	Project 2	Project 3	Project 4	Project 5	Project 6	Project 7	Project 8	Project 9	Project 10	Project 11	Mean	Std Dev	Range
Judge 1	90		99	97	92	96		96	92			94.57143	3.258688	90-99
Judge1 z-score	-1.40284		1.359004	0.74526	-0.7891	0.438389		0.438389	-0.7891					
Judge 2	62	77		95	84		74			88	69	78.42857	11.38504	62-95
Judge2 z-score	-1.443	-0.12548		1.455545	0.489364		-0.38898			0.840703	-0.82815			
Judge 3	72		90		77	88	74		84	92		82.42857	8.079958	72-92
Judge3 z-score	-1.29067		0.937063		-0.67186	0.689537	-1.04315		0.194485	1.184589				
Judge 4		50	85				65	90	80		77	74.5	14.67992	50-90
Judge4 z-score		-1.66895	0.715263				-0.64714	1.055864	0.374661		0.170301			
Judge 5		70		82		85		88		90	72	81.16667	8.352644	70-90
Judge5 z-score		-1.3369		0.099769		0.458936		0.818104		1.057549	-1.09746			
Avg z-score	-1.37884	-1.04378	1.003777	0.766858	-0.32386	0.528954	-0.69309	0.770786	-0.07332	1.027614	-0.5851			
Rank	11	10	2	4	7	5	9	3	6	1	8			

Note 1: Judge 1 scored his first and second choices with just a 2 point difference but since his standard deviation is such a low number of 3.259, this causes the z-scores for these 2 projects to be wildly different which might not have been the intent. Judge 5 also scored his first two projects with a 2 point difference but the difference in the two projects z-scores is not as great as his standard deviation is a respectable 8.353.

To demonstrate further, each of the judges had 2 scores with a 5-point difference and shows that z-scores for smaller ranges are more affected than for larger ranges:

	Judge 1: (90-99; 10 point range) 5-point difference = 1.53435 z-score differential
	Judge 2: (62-95; 34 point range) 5-point difference = 0.43917 z-score differential
	Judge 3: (72-92; 21 point range) 5-point difference = 0.61881 z-score differential
	Judge 4: (50-90; 41 point range) 5-point difference = 0.340602 z-score differential
	Judge 5: (70-90; 21 point range) 5-point difference = 0.598613 z-score differential

Note 2: Judge 2 had more room to maneuver as illustrated by the distance between the project he liked best, #4, and the next two and because of this, his favorite project received the highest z-score on the table. The other judges were not too impressed with this project, but judge 2 helped this project earn a 4th place ranking.

Note 3: Judge 1 might have thought that all of the projects that he/she saw were good but the z-score for project 1 from judge 1 and judge 2 are almost the same although their raw scores differ significantly; these two judges have widely disparate mean values and a sizable difference in their standard deviations.