

Table 1 Data source specific information

Course	Course features	Academic year	Number of students	Seat location	Basic attributes
C/C++	Platform class/ Practice class	Freshman	63	Check in once a week for 14 weeks.	Name, Sex, Student ID, Score, Score ranking
Software Engineering	Core courses	Sophomore	75	Check in once per week for 13 weeks.	
Web	Elective	Junior	103	Check in once per week for 9 weeks.	

Table 2 Variable definition table

Variable Name	Variable Definition
Academic year	Freshman, sophomore, and junior were respectively labeled A, B, and C.
Ranking	According to the final exam results, students with the same score are ranked the same
Seat ranking	The average of the academic performance rankings of students who occupied the same seat in a semester (For example, a seat has been occupied nine times in a semester, perhaps by different students. Then the seat ranking is the average ranking of the student who has selected the seat, not taking absences into account.)
Level of attendance	The total number of times each row of seats was occupied during the semester.
Occupancy rate	The quotient of the number of attendance and the maximum number of students per row.
Grade ranking groups	Ranking is in ascending order and divided into four groups: A+, A-, B+ and B-
Front row occupancy rate	The front row occupancy rate of the ranking group is the ratio of students sitting in the front half of the classroom in each group to that group of students
Sequence of last average displacement	A sequence composed of the Euclidean distance between the nth seat and the n-1th seat of the student
Last average displacement	The average value of the sequence of last average displacement

Table 3.1 Freshman seat ranking statistics

Row	Max	Min	Ave	Interval difference	Level of attendance	Occupancy rate
1	50.5	24.5	34.34	26	148	81.32%
2	46.8	24.8	36.43	22	144	79.12%
3	44.2	27	34.01	17.2	155	85.16%

4	45.4	20.3	35.15	25.1	140	76.92%
5	48.4	15.7	32.71	32.7	131	71.98%
6	50.7	24.3	39.56	26.4	114	62.64%
7	61	32.5	45.93	28.5	104	57.14%
8	56.3	13.5	41.87	42.8	72	39.56%
9	62.5	9	39.62	53.5	34	18.68%

Table 3.2 Sophomore seat ranking statistics

Row	Max	Min	Ave	Interval difference	Level of attendance	Occupancy rate
1	54	20.3	37.70	33.7	75	44.38%
2	38.2	16.3	25.65	21.9	87	51.48%
3	34.2	16	23.63	18.2	119	70.41%
4	43.3	17.8	26.62	25.5	122	72.19%
5	39.8	21.6	30.71	18.2	115	68.05%
6	45.2	21	33.25	24.2	112	66.27%
7	57.5	18.5	35.80	39	96	56.80%
8	62	23.2	39.98	38.8	60	35.50%
9	62.5	28	40.65	34.5	24	14.20%

Table 3.2 Junior seat ranking statistics

Row	Max	Min	Ave	Interval difference	Level of attendance	Occupancy rate
1	76.00	30.30	44.05	45.70	85	72.65%
2	73.90	27.00	51.58	46.90	101	86.32%
3	65.00	36.70	51.72	28.30	104	88.89%
4	73.70	39.10	56.45	34.60	113	96.58%
5	79.00	37.00	49.71	42.00	106	90.60%
6	64.20	30.10	47.06	34.10	100	85.47%
7	77.60	39.80	54.63	37.80	93	79.49%
8	81.50	35.30	55.68	46.20	88	75.21%
9	70.70	43.00	55.85	27.70	76	64.96%

Table 4 Front row occupancy rate

Group	Freshman	Sophomore	Junior
A+	0.79	0.50	0.77
A-	0.53	0.44	0.50
B+	0.47	0.25	0.46
B-	0.44	0.40	0.44

Table 5 Pearson correlation analysis results

Grade	Number of students	Analysis	Variance	Last average displacement
Freshman	75	Pearson correlation	-.007	-.264 ⁺
		Significance(bilateral)	.949	.022
Sophomore	63	Pearson correlation	-.161	-.260 ⁺

		Significance(bilateral)	.208	.039
Junior	103	Pearson correlation	.008	-.091
		Significance(bilateral)	.935	.042

Note: **. Significantly correlated at the .01 level (two-sided).

*. Significantly correlated at the 0.05 level (two-sided).

Table 6 Student data based on Last average displacement ranking

Grade	Data sources	Average grade	Average grades for the academic year	Variance	Average variance for the academic year
Freshman	Top 20%	89.47	89.11	0.96	1.86
	Bottom 20%	85.60		2.56	
Sophomore	Top 20%	74.15	71.29	0.43	1.56
	Bottom 20%	69.53		2.56	
Junior	Top 20%	71.45	68.51	0.48	1.45
	Bottom20%	74.95		2.33	