

Statistics

Common Sampling Techniques

Using the student survey at NumStats University, complete #1– 5. In the chart below, use R for your random selections, S for systematic, C for cluster, and * for your class rank selections. Round all averages to the nearest tenth (IQ or distance) or hundredth (GPA). Use the same variable for #1–5; record your choice below, and show steps toward finding the population mean for that variable.

Student #	Gender	Class Rank	GPA	Miles to school	traveled to school	IQ	Major Field	Student #	Gender	Class Rank	GPA	Miles to school	traveled to school	IQ	Major Field
1	M	Fr	1.4	1	104	Bio	26	M	Fr	1.1	8	100	Ed		
2	M	Fr	2.3	2	95	Ed	27	F	Jr	2.1	3	101	Bus		
3	M	So	2.7	6	108	Psy	28	M	Gr	3.7	5	99	Bio		
4	F	So	3.2	7	119	Eng	29	M	Se	2.4	8	105	Eng		
5	F	Gr	3.8	12	114	Ed	30	M	So	2.1	15	108	Bus		
6	M	Jr	4.0	13	91	Psy	31	M	Gr	3.9	2	112	Ed		
7	F	Jr	3.0	2	106	Eng	32	F	Jr	2.4	4	111	Psy		
8	M	Jr	3.3	6	100	Bio	33	M	Se	2.7	6	107	Eng		
9	F	Se	2.7	9	102	Eng	34	F	So	2.5	1	104	Bio		
10	F	So	2.3	5	99	Ed	35	M	Se	3.2	3	96	Bus		
11	M	Se	1.6	18	100	Bus	36	F	Fr	3.4	7	98	Bio		
12	M	Gr	3.2	7	105	Psy	37	M	Gr	3.6	14	105	Ed		
13	F	Gr	3.8	3	103	Bus	38	M	Jr	3.8	4	115	Psy		
14	F	Se	3.1	5	97	Eng	39	F	Se	2.2	8	113	Eng		
15	F	Jr	2.7	5	106	Bio	40	F	So	2.0	8	103	Psy		
16	F	Fr	1.4	4	114	Bus	41	F	Fr	2.3	9	103	Eng		
17	M	So	3.6	17	102	Ed	42	F	Se	2.5	10	99	Bus		
18	M	Fr	2.2	1	101	Psy	43	M	Gr	3.7	13	114	Ed		
19	F	So	4.0	7	108	Bus	44	M	Fr	3.0	11	121	Bus		
20	M	Gr	2.1	4	97	Ed	45	M	Jr	2.1	10	101	Eng		
21	F	Fr	2.0	3	113	Bio	46	F	Jr	3.4	2	104	Ed		
22	F	So	3.6	4	104	Bio	47	M	So	3.6	9	105	Psy		
23	F	Gr	3.3	16	110	Eng	48	M	Se	2.1	1	97	Psy		
24	F	Se	2.5	4	99	Psy	49	F	Gr	3.3	12	111	Bio		
25	M	So	3.0	5	96	Psy	50	F	Fr	2.2	11	102	Bio		

Variable: _____ Population mean: _____

- Using a random number generator, select 10 students at random and find the sample mean (average) of the GPA, IQ, or distance traveled to school. Compare this sample mean with the population mean for your variable of choice.
- Select a sample of 10 students by the systematic method and compute the sample mean (average) of the GPA, IQ, or distance traveled to school. Compare this sample mean with the population mean for your variable of choice.
- Select a cluster of 10 students—for example, students 9 through 18—and compute the sample mean (average) of the GPA, IQ, or distance traveled to school. Compare this sample mean with the population mean for your variable of choice.
- Divide the 50 students into subgroups according to class rank (freshmen, sophomores, juniors, seniors, and grad students). Then select a sample of 2 students from each rank and compute the mean for the GPA, IQ, or distance traveled to school each day for this sample of 10 students. Compare this sample mean with the population mean for your variable of choice.
- In your opinion, which sampling method(s) provided the best sample to represent the population?

For #6-10, the chart below shows the 50 states (plus Washington D.C.) and the number of electoral votes each location has in the 2004 and 2008 presidential elections. The total electoral votes is _____ and then the mean number of votes is _____. Use the same coding as you did earlier on the chart below: R for random, S for systematic, C for cluster, and * for regional selections Round all statistics for #6-9 to the nearest tenth.

6. Select a random sample of 10 states, and find the mean number of electoral votes for this sample. Compare this mean with the population mean.
7. Select a systematic sample of 10 states, and compute the mean number of electoral votes for this sample. Compare this mean with the population mean.
8. Select a cluster of 10 states, and compute the mean number of electoral votes for this sample. Compare this mean with the population mean.
9. Divide the 50 states into 5 subgroups according to geographic location, using a map of the United States. Each subgroup should include 10 states. The subgroups should be northeast, southeast, central, northwest, and southwest. Then select a sample of 2 states from each subgroup, and compute the mean number of electoral votes for this sample of 10 states. Compare this mean with the population mean.
10. In your opinion, which sampling method(s) provided the best sample to represent the population?

1. Alabama	9	26. Missouri	11
2. Alaska	3	27. Montana	3
3. Arizona	10	28. Nebraska	5
4. Arkansas	6	29. Nevada	5
5. California	55	30. New Hampshire	4
6. Colorado	9	31. New Jersey	15
7. Connecticut	7	32. New Mexico	5
8. Delaware	3	33. New York	31
9. District of Columbia	3	34. North Carolina	15
10. Florida	27	35. North Dakota	3
11. Georgia	15	36. Ohio	20
12. Hawaii	4	37. Oklahoma	7
13. Idaho	4	38. Oregon	7
14. Illinois	21	39. Pennsylvania	21
15. Indiana	11	40. Rhode Island	4
16. Iowa	7	41. South Carolina	8
17. Kansas	6	42. South Dakota	3
18. Kentucky	8	43. Tennessee	11
19. Louisiana	9	44. Texas	34
20. Maine	4	45. Utah	5
21. Maryland	10	46. Vermont	3
22. Massachusetts	12	47. Virginia	13
23. Michigan	17	48. Washington	11
24. Minnesota	10	49. West Virginia	5
25. Mississippi	6	50. Wisconsin	10
		51. Wyoming	3

Source: <http://www.fec.gov/pages/elevote.htm> (2001-2010)