Lesson #11 · Topic 1G · Practice

Answer Key

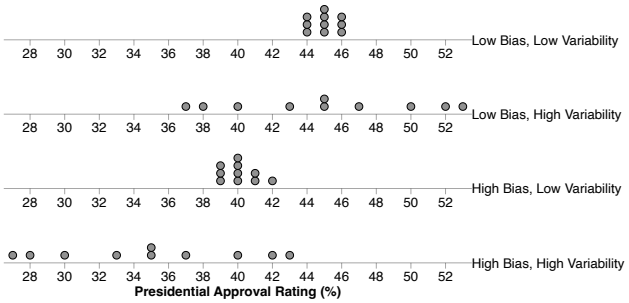
1. a. For both sampling methods, the population is split into groups (clusters or strata).
   b. For a cluster random sample each group has individuals that are different (heterogeneous), while in a stratified random sample, each group has individuals that are similar (homogeneous). Also, a cluster random sample selects an SRS of groups and then collects data from every individual in the selected groups (all from some), while a stratified random sample selects an SRS from each group (some from all).

2. a. The counselor should use the physical education classes as the clusters because multiple grade levels are represented in each class, and we know that juniors and seniors are more likely to have their driver's licenses than freshmen and sophomores. The counselor wants clusters that are heterogeneous with respect to grade level.
   b. The data can be collected more easily and efficiently. The counselor will only need to go to the few selected rooms (and interview all students in those rooms) rather than having to go to many rooms to find all the students selected by a simple random sample.

3. a. Label each player with a unique number from 1 to 780. Use a random number generator to generate 100 numbers between 1 and 780 (no repeats). Select each player that corresponds to the numbers that are generated.
   b. For one team, label each player with a unique number from 1 to 26. Use a random number generator to generate three numbers between 1 and 26 (no repeats). Select each player that corresponds to the numbers that are generated. Repeat this process for all 30 teams.
   c. Label each team with a unique number from 1 to 30. Use a random number generator to generate three numbers between 1 and 30 (no repeats). Select every player for each team that corresponds to the numbers that are generated.
   d. Label each player with a unique number from 1 to 780. Use a random number generator to generate one number between 1 and 10. The player that corresponds to this number is the first player selected. Then select every 10th player that is past this player on the list until 78 players are selected.

4. a. Stratified random sample. This sampling method guarantees that houses from every neighborhood will be represented in the sample.
   b. Cluster sample. This sampling method makes it easier and faster to collect the home values, as the inspector will only need to go to 5 neighborhoods.
   c. The stratified random sample, because some neighborhoods have much more expensive houses than other neighborhoods and the stratified random sample ensures that houses from all neighborhoods will be represented, which should produce a better estimate for the true average house value in Chicago.

5. Answers may vary. Possible answers incorporating appropriate bias and variability are shown below.



6. C

7. D