Problem 1 – Find a Simple Random Sample

In a **simple random sample (SRS)**, every individual in the population has an equal chance of being selected and every group of size n has an equal chance of being selected.

One common way to find a SRS is to assign every member in the population a different number and then randomly choose numbers. The list of initials represents a population of 30 people.

1-GN	6-HS	11-CI	16-RU	21-EP	26-PS
2-TB	7-TW	12-HT	17-DI	22-RJ	27-FL
3-BM	8-LS	13-VN	18-YD	23-JS	28-HW
4-OR	9-AK	14-FJ	19-GK	24-EB	29-FV
5-BL	10-SC	15-MT	20-ZA	25-KR	30-OT

1. Use **randInt** to select a sample of 8 people from the population. Record them below.

Problem 2 – Find a Stratified Random Sample

A stratified random sample divides the population into two or more groups with common characteristics and a SRS is taken from each group. Suppose in the list of 30 people that those numbered 1–10 are women while the rest of the numbers are men.

2. Use **randInt** to select a group of 12 people so that half are women and half are men. Record the numbers below.

3. Explain why the sample is disproportionate to the population.

4. Explain how you could find a proportionate sample of 12 people.

5. Find a proportionate stratified sample of 12 people from the list.

Problem 3 – Find a Cluster Sample

A cluster sample divides the population into groups and a few of those groups are randomly selected. Then, every member in the selected groups is a member of the sample.

6. Do you think cluster sampling would be more or less precise than finding a SRS or a stratified sample? Justify your answer.

7. Suppose in the list that every multiple of 5 people (1-5, 6-10, etc.) live in the same apartment complex. Randomly select two clusters and record the initials of the people.

Problem 4 – Find a Systematic Sample

In systematic sampling, a starting point on the population list is randomly chosen and every *n*th name is chosen.

8. Use **randInt** to select the starting point. Then choose every fifth name on the list until you get back to the starting point. List your sample of 6 people here.

9. Explain why systematic sampling is not a type of simple random sampling.

10. Discuss advantages and disadvantages of each sampling method and when one would be used over another.

11. Using **randInt**, replace each pair of initials in the table at the start of the exercise with a random number between 1 and 30, and then find the mean value for each sample taken in the above problems. Repeat by replacing each pair of initials with a 1 if the random number between 1 and 30 is less than or equal to 10 and with a 2 if the number is greater than 10. Repeat a third time by replacing each pair of initials in a column with the same random number chosen between 1 and 30, and a fourth time by replacing each pair with the number of the row it is in. Compare your results with those of the other students, and discuss what the similarities and differences say about each sampling method.