14. Statistics

Designing an effective survey

Your computer science class has made an app for your school. Some of the features of the app include:

- maps for getting around the site
- information about the teachers
- results from the school sports teams' recent games
- access to your homework platform
- a calendar that shows your class timetable

You are on the sub-team that is responsible for setting up a group of student testers to provide feedback on the app, and for collecting and analysing the feedback. You are keen to use the right sampling techniques so that the feedback is representative of the broader population of future users of the app.

Task one: Sampling

1. You consider taking a systematic sample of 40 people from your total school population of 840. What sampling interval would you use?

2. You consider standing outside the canteen and inviting the first 40 students who walk past you to join your tester group. Explain why this sampling method may not be representative of the whole school population.

3. You want to ensure you have a fair representation of different age groups in your group of testers. You consider inviting a certain number of students per year to join the tester group based on how large each year is in proportion to the total school population. What is the name for this sampling method?

4. Another option would be to assign all students a number then have a computer programme randomly generate numbers within that range. What is the name of this sampling method and what are the pros and cons of choosing this option?

5. You decide to take a stratified sample of 40 students from the following school population data. How many students from each year should you invite to join your tester group?

Year group	Number of students
7	197
8	204
9	189
10	112
11	138

Task two: Questionnaire design

Below is an extract from the draft questionnaire that will be shared with the tester group. Suggest improved questions and possible answers, and write down your criticisms of the current survey.

Questionaire	
Question	Answer options
How often did you use the app over the week?	Very often
	Occasionally
	Not very often
	Never
What did you think of the timetable feature?	Very good
	Good
	Average
How much time did you spend on the app over the week?	10-15 minutes
	15-20 minutes
	20-30 minutes
	30-60 minutes

Task three: Analysing the results

1. The below frequency table shows how long each member of the test group spent on the app over the course of a week. Select an appropriate way to visually present this data and explain why you have selected this.

Time spent on the app (minutes)	Number of students
$0 < x \leq 15$	0
$15 < x \leq 30$	8
$30 < x \leq 45$	10
$45 < x \leq 60$	14
$60 < x \leq 75$	8

2. You produce a summary of your findings to share with the class and make the following statements. Comment on the accuracy of these statements:

   a. 55% of the school will spend more than 45 minutes on the app each week.

   b. The school is 49% male and 51% female overall. Our tester group was 60% female but we do not believe that this would have impacted our results.

   c. Overall, the school felt that the app was very good and would continue to use it.