Your grade: **100%**

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Next item →

Overview

Now that you have explored how businesses use data in the real world, pause for a moment and think about what you are learning. In this self-reflection, you will consider fairness and data use in three example business cases and respond to brief questions with your thoughts.

1. **Case Study #1**   1 / 1 point

To improve the effectiveness of its teaching staff, the administration of a high school offered the opportunity for all teachers to participate in a workshop. They were not required to attend; instead, the administration encouraged teachers to sign up. Of the 43 teachers on staff, 19 chose to take the workshop.

At the end of the academic year, the administration collected data on teacher performance for all teachers on staff. The data was collected via student survey. In the survey, students were asked to rank each teacher's effectiveness on a scale of 1 (very poor) to 6 (very good).

The administration compared data on teachers who attended the workshop to data on teachers who did not. The comparison revealed that teachers who attended the workshop had an average score of 4.95, while teachers who did not attend had an average score of 4.22. The administration concluded that the workshop was a success.

Reflection

Consider this scenario:

- What are the examples of fair or unfair practices?
- How could a data analyst correct the unfair practices?

Now, write 2-3 sentences (40-60 words) in response to each of these questions. Enter your response in the text box below.

> An unfair practice is assuming the workshop caused better performance without accounting for self-selection bias i.e. teachers who chose to attend may already be more motivated or effective. A fair practice is collecting feedback from students using a consistent scale across all teachers. To improve fairness, we could use statistical techniques like matching or regression analysis to control for pre-workshop performance and other variables. We could also collect baseline data before the workshop to compare improvements more accurately and reduce bias in the final conclusions.

Feedback
Great work reinforcing your learning with a thoughtful self-reflection! In your response, you likely noted that this is an example of unfair practice. It is tempting to conclude—as the administration did—that the workshop was a success. However, since the workshop was voluntary and not random, it is not appropriate to infer a causal relationship between attending the workshop and the higher rating.

The workshop might have been effective, but other explanations for the differences in the ratings cannot be ruled out. For example, another explanation could be that the staff volunteering for the workshop were the better, more motivated teachers. This group of teachers would be rated higher whether or not the workshop was effective.

It's also notable that there is no direct connection between student survey responses and workshop attendance. The data analyst could correct this by asking for the teachers to be selected randomly to participate in the workshop. They could also collect data that measures something more directly related to workshop attendance, such as the success of a technique the teachers learned in that workshop.

2. Case Study #2

An automotive company tests the driving capabilities of its self-driving car prototype. They carry out the tests on various types of roadways—specifically, a race track, trail track, and dirt road.

The researchers only test the prototype during the daytime. They collect two types of data: sensor data from the car during the drives and video data of the drives from cameras on the car.

They review the data after the initial tests. The results illustrate that the new self-driving car meets the performance standards across each of the roadways. As a result, the car can progress to the next phase of testing, which will include driving in various weather conditions.

Reflection

Consider this scenario:

- What are the examples of fair or unfair practices?
- How could a data analyst correct the unfair practices?

Now, write 2-3 sentences (40-60 words) in response to each of these questions. Enter your response in the text box below.

> A fair practice is testing the car on multiple types of road surfaces and using both sensor and video data for evaluation. An unfair practice is limiting testing to daytime only, which ignores performance in low-light or nighttime conditions—crucial for real-world use. A data analyst could recommend expanding testing to include nighttime and low-visibility scenarios to ensure a complete performance evaluation. They could also compare results across different times of day to identify any weaknesses the system may have under varied lighting conditions.

Feedback

Once again, this case study shows an unfair practice. Your response probably mentioned that, although the researchers test the prototype on three different tracks, they only conduct tests during the day.

Conditions on each track may be very different during the day and night and this could change the results significantly. The data analyst should correct this by asking the test team to add in nighttime testing to get a full perspective of how the prototype performs at any time of the day on the tracks.

3. Case Study #3

An amusement park plans to add new rides to their property. First, they need to determine what kinds of new rides visitors want the park to build. In order to understand their visitors' interests, the park develops a survey.

They decide to distribute the survey near the roller coasters because the lines are long enough that visitors will have time to answer all of the questions. After collecting this survey data, they find that most of the respondents want more roller coasters at the park. They conclude that they should add more roller coasters, as most of their visitors prefer them.

Reflection

Consider this scenario:

- What are the examples of fair or unfair practices?
- How could a data analyst correct the unfair practices?

Now, write 2-3 sentences (40-60 words) in response to each of these questions. Enter your response in the text box below.

> A fair practice is using a survey to gather direct feedback from visitors. An unfair practice is distributing the survey only near roller coasters, which introduces location bias by oversampling roller coaster enthusiasts and ignoring visitors who prefer other attractions. A data analyst could ensure a more balanced sampling by distributing the survey across different park areas, like family rides, food courts, and water attractions. This would capture a wider range of visitor preferences and lead to more accurate, inclusive conclusions.

Feedback

A thoughtful reflection would have included information about the decision to distribute surveys in places where visitors would have time to respond. Otherwise, it accidentally introduces sampling bias.

The only respondents to the survey are people waiting in line for the roller coasters. This may unfairly bias survey results, because respondents might prefer roller coasters. A data analyst could reduce sampling bias by distributing the survey at the entrance and exit of the amusement park. This would avoid targeting roller coaster fans and provide results from the park's general audience.