1. The Sith Lords are concerned that their recruiting slogan, "Give In to Your Anger," isn't very effective. Darth Vader develops an alternative slogan, "Together We Can Rule the Galaxy." They compare the slogans on two groups of 50 captured droids each. In one group, Emperor Palpatine delivers the "Anger" slogan. In the other, Darth Vader presents the "Together" slogan. 20 droids convert to the Dark Side after hearing Palpatine's slogan, while only 5 droids convert after hearing Vader's. The Sith's data scientist concludes that "Anger" is a more effective slogan and should continue to be used.

Ans:

Emperor Palpatine may be stronger / intimidating on the dark side's power to influence droids, whereas Darth Vader may not be so strong / intimidating and so the analysis can be a biased one.

To correct this, both groups of droids, should be subject to the same conditions, and then check the conversions. Or may be a survey should be conducted on both groups of droids to know the effect of both Sith Lords or other situations affecting the conversion.

1. In the past, the Jedi have had difficulty with public relations. They send two envoys, Jar Jar Binks and Mace Windu, to four friendly and four unfriendly planets respectively, with the goal of promoting favorable feelings toward the Jedi. Upon their return, the envoys learn that Jar Jar was much more effective than Windu: Over 75% of the people surveyed said their attitudes had become more favorable after speaking with Jar Jar, while only 65% said their attitudes had become more favorable after speaking with Windu. This makes Windu angry, because he is sure that he had a better success rate than Jar Jar on every planet. The Jedi choose Jar Jar to be their representative in the future.

Ans:

Jar Jar is not a Jedi whereas Mace Windu is the jedi master. So, this comparison may not be appropriate. Therefore, a solution to this could be to choose another representative.

The statement “Jar Jar was much more effective than Windu” can be an effect of Simpson's paradox. If we break this up by planet or may be by the kind of the people surveyed, it may be possible to see that Windu attained better improvement rates.

Also, Jar Jar Binks was sent to four friendly planets whereas Mace Windu was sent to four unfriendly planets which is creating different conditions for each, and thus making the study vulnerable to bias.

1. A company with work sites in five different countries has sent you data on employee satisfaction rates for workers in Human Resources and workers in Information Technology. Most HR workers are concentrated in three of the countries, while IT workers are equally distributed across worksites. The company requests a report on satisfaction for each job type. You calculate average job satisfaction for HR and for IT and present the report.

Ans:

Calculating the average job satisfaction for HR and for IT may suffer from Simpson's paradox because of so many factors involved (like: different locations, different department, different work timings and so many others)

It would be better to classify the results for each location and department rather than just averaging by department.

1. When people install the Happy Days Fitness Tracker app, they are asked to "opt in" to a data collection scheme where their level of physical activity data is automatically sent to the company for product research purposes. During your interview with the company, they tell you that the app is very effective because after installing the app, the data show that people's activity levels rise steadily.

Ans:

There may be a bias here because this dataset includes people who opted for the data collection scheme. Or maybe because people who opted for this are more likely to improve their activity levels.

For this study, a random sample of people should be selected who installed the app but not necessarily opted for data collection scheme. Means, study should include the people who didn’t opted for this data collection scheme.

1. To prevent cheating, a teacher writes three versions of a test. She stacks the three versions together, first all copies of Version A, then all copies of Version B, then all copies of Version C. As students arrive for the exam, each student takes a test. When grading the test, the teacher finds that students who took Version B scored higher than students who took either Version A or Version C. She concludes from this that Version B is easier and discards it.

Ans:

When she stacked the three versions together, first all copies of Version A, then all copies of Version B, then all copies of Version C, tests have not been randomly distributed to students, making this decision vulnerable to bias.

A solution to this could be to randomly distribute tests to students.