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: It could be because of who delivered it. If both the slogans are delivered by the same person, the effectiveness of the slogan could have been determined more accurately.

2. 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: Who goes where first will matter in this case. If Jar Jar visited friendly planets first, he could convince more number of people easily. To avoid this bias, each of them should have a plan of visiting 2 friendly and 2 unfriendly planets first and the remaining 4 later. This would give better estimates on who convinced more people.

3. 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: This could be a classic case of Simpson’s paradox. It is important to present data based of each country rather than aggregating it. Averaging might give results that could be quite opposite to the results from individual country.

4. 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 is a bias involved in this test. Not all people will “opt in” for data collection and there is a possibility that people who are dedicated to get fit gets involved with this app more than others. Collecting information from people who have not opted in and then taking results will eliminate bias.

5. 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: There is a chance that students picking up the question papers are not random. A bunch of students who are friends or who prepared for the exam together might have entered the exam room at the same time. Instead the teacher must have shuffled the question paper while stacking them and then compared the results.