The sales of ice-cream and air conditioners go up when the temperature rises. Does this mean that if the sales of ice-cream go up, the sale of air conditioners will also go up? No right? In fact, they are related by a third factor that is the rising temperature or there may be a discount going on the sale of any of both the things that lead to increased sales but this fact is ignored in your conclusion.

When we work with data, more often than not we are supposed to conclude our findings. It is for this purpose that we must understand the concept of correlation and causation.

Correlation

Correlation is the measure of degree to which two variables move in a relationship to each other. however, it is important to understand that the correlation does not mean that one event *causes* another event.

If one event goes up and the other also goes up then the two events have a positive correlation. If one goes down and the other also goes down, they have a negative correlation. And if the two events do not affect each other (i.e., if one goes up or down and the other stays the same), there is no correlation.

Causation

Causation means that one event leads to a specific outcome/event. For example, working for more hours will lead to a higher pay total i.e., working for more ours lead to a higher pay.

Learning the difference between the two

Consider a scenario where pink eye infection appears to predominantly affect people living in slums, leading to the assumption that it's a consequence of unhygienic living conditions in these areas.

However, upon further investigation, it's revealed that the infection is primarily caused by vitamin or nutrient deficiencies. Given that many slum residents suffer from malnutrition, they are more susceptible to the infection.

Thus, unsanitary conditions turned out to be a correlation only while the cause is the malnourishment.

It's crucial to establish the correct relationship between variables to make informed decisions and identify the root causes of problems. In this case, recognizing that malnutrition, not just unhygienic conditions, is a significant contributor to the pink eye infection allows for more targeted interventions to address the issue effectively.