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Section1).

1. Write a query to print the number of employees per department in the organization

Select Department , COUNT(*) From Employee Group By Department;

2. Write an SQL query to find the name of the top-level manager of each department

Select Department, Max(Salary) From Employee Group By Department;

3. Write a query to find the total incentive received by a given employee in a given month.

Select Sum(Salary) From employees;

4. Write a query to find the month where employees got maximum incentive

Selct MAX(salary) From employees;

Section2).

1.You have two sand timers, which can show 4 minutes and 7 minutes respectively. Use both the sand timers (at a time or one after other or any other combination) and measure a time of 9 minutes.

Ans.

1. Start the 7 minute sand timer and the 4 minute sand timer.

2. Once the 4 minute sand timer ends turn it upside down instantly.

Time Elapsed: 4 minutes. At this moment, 3 minutes of sand is left in the 7 minute sand timer.

3. Once the 7 minute sand timer ends turn it upside down instantly.

Time Elapsed: 7 minutes. At this moment, 1 minutes of sand is left in the 4 minute sand timer.

4. After the 4 minute sand timer ends, only 1 minute is elapsed in 7 minute sand timer, therefore for another minute turn the 7 minute sand timer upside down.

Time Elapsed: 8 minutes.

5. When the 7 minute sand timer ends, total time elapsed is 9 minutes.

So effectively $8 + 1 = 9$.

2. John and Mary are a married couple. They have two kids, one of them is a girl. Assume safely that the probability of each gender is $1/2$. What is the probability that the other kid is also a girl?

Ans.

John and Mary had two kids. As per probability, there are four options: {BB, BG, GB, GG} - all equally probable.

So, sample space (S) = {BB, BG, GB, GG}

Now, the event that one of the kids is a girl = A = {BG, GB, GG}.

So, $P(A) = n(A) / n(S) = 3 / 4$

And, the event that both kids are girls = B = {GG}.

So, $(B \cap A) = \{GG\}$ and, $P(B \cap A) = 1 / 4$

So, $P(B / A) = P(B \cap A) / P(A) = (1 / 4) / (3 / 4) = (1 / 3)$.

The answer is $(1 / 3)$.

3. The following appeared as part of a campaign to sell advertising time on a local radio station to local businesses.

Ron's Cafe began advertising on our local radio station this year and was delighted to see its business increase by 10 percent over last year's totals. Their success shows you how you can use radio advertising to make your business more profitable.

Discuss how well reasoned you find this argument. In your discussion be sure to analyze the line of reasoning and the use of evidence in the argument. For example, you may need to consider what questionable assumptions underline the thinking and what alternative explanations or counterexamples might weaken the conclusion. You can also discuss what sort of evidence would strengthen or refute the argument, what changes in the argument would make it more logically sound and what, if anything, would help you better evaluate in conclusion.

Ans.

The argument claims that The Cumquat Café started advertising itself on a local radio station, and because of which the business of The Cumquat Café increased by 10 percent when compared in comparison to that of the business of the last year. Furthermore, the argument states that this evidence shows that by advertising business using radio, the business becomes profitable the author states that by advertising through radio, the business increases its profitability. This argument manipulates the facts and conveys a distorted view of the situation. Moreover, this argument gives only one example to conclude that radio advertising serves to make business profitable. There is clearly not much information given and fails to mention several key factors. The conclusion relies on assumption and hence the argument is weak and has several flaws.

Firstly, the argument claims that advertising on radio about The Cumquat Café helped in increase of profit by 10 percent over last year's total by advertising through radio, the profit of The Cafe has increased by 10% over the last year's figure. This is an invalid example because there might be many more reasons due to which there was an increase in the profit. One of reasons which might be possible is that The Cumquat Café might have increased the number of items in their menu which helped them in attracting more customers and ultimately resulted in the increase in profit by 10 percent. Second reason can be that the café has might have given some discounts on their items and might have probably started some new schemes. which were responsible for the increase for the increase of 10 percent of the profits. The argument might have been much clearer if it explicitly stated some more reasons or evidences as mentioned above. The assumption which was given by the author was weak and did not support the claim.

Secondly, the argument readily assumes that the success of The Cumquat Café was due to the advertisement given on radio. There is no clear evidence on which it could have been proved that the 10 percent profit was because of radio advertising. The Cumquat Café might have given their advertisement through many mediums such as newspaper, brochures including radio advertisement. The success might have been probably because of newspaper advertising as many people are more convinced through newspapers. The author did not mention that only because of radio there was a success. The author failed to mention that radio was the sole reason for the success of the business.

Without unconvincing answers to the question, one is left with the impression that the claim is more of a wishful thinking rather than substantive evidence.

In conclusion, the argument is flawed for the above mentioned reasons and is therefore unconvincing. It could have been considerably strengthened if the author would have clearly mentioned all the relative facts about the argument, such as, the description of The Cumquat Café, performance of the café or any changes in The Cumquat Café as compared to the previous year which would have helped to access the merit to the argument. Without full knowledge of all the contributing factors in this argument, it remains unsubstantiated and open to debate.