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1)Calculate all 4 business moments using pen and paper for the below data set?

Jpg files attached mam/sir for this questions..

2)What is the significance of expected value when simple mean (Sum of all observations/number of observations) is already in place.

It is true that simple mean is sufficient enough for having an idea about the data by computing with it's formula (Sum of all observations/number of observations). But, by foregoing this computation we assume that the possibility of each event happening is equal and hence we directly compute them by summing them and taking their average. But, what if the occurance of all the events arent given? Assume we have 4 events possibly to occur namely A B and C. So we aren given with their number of occurance in difinite numbers say, A happens for 4 times, B happens for 8 times and so on. For this scenario simple mean itself is enough. But, whatif instead of their number of occurance, their probability is given? Take for example, possibility of A to occur is 0.48, possibility of B to occur is 0.31 and for C 0.21. This would get us to a point where we need to consider the weight of the event. As given in the example above, the probability of A is more than B and C. That means when we correlate this with its occurance, we can infer that the mean or the ideal possibility of the event to occur would be closest to that of A and farther from C(Holding the least probability) Imagine having more random variables and complex probability values. That is when the significance of expected mean value overcomes the simple mean value. As explained in the previous question, instead of summing the probability, we should consider the weight of each event before averaging them.

Note: The sum of the probabilities should always be 1.

3)Having skewness in the curve considered to be bad in the analysis?

Skewness refers to distortion or lack of symmetry in a symmetrical bell curve, or normal distribution in a set of data. If the curve is shifted to the left or right, it is said to be skewed. Skewness can be qualified as a representation of the extent to which a given distribution varies from a normal distribution. A normal distribution has a skew of zero.

Skewed data can often lead to skewed residuals because "outliers" are strongly associated with skewness, and outliers tend to remain outliers in the residuals, making residuals skewed. But technically there is nothing wrong with skewed data. It can often lead to non-skewed residuals if the model is specified correctly. Mean: Average of the data sets Median: Central value in the data sets Mode: Repeating number in the data set

4)Evaluate the probabilities for continuous normal distribution with given mean = 680 and standard deviation = 31.

a)P(X<711)

b)P(X>740)

c)P(600

d)P(X=720)

To evaluate the probability value for continuous normal distribution, we calculate the z-score with the given mean and standard variation for each of the data point given by the formula,

Z-score = (X – mean) / standard deviation.

Then the z values are looked into the corresponding z-table to identify the probability less than or equal to that value.

For the given data points we have,

1. P(X<711)

The z-score of this would be = (711-680)/31 = 1.

Hence, it is one standard deviation away from the mean in the positive x axis.

In the z-table, the probability value for z = +1 is 0.8413 which is 84.13%.

2. P(X>740)

The z-score of this would be = (740-680)/31 = 1.93.

Hence, it is 1.9 times the standard deviation away from the mean in the positive x axis.

In the z-table, the probability value for z = +1.93 is 0.9732.

But it is asked for probability greater than 740. Hence, we get the value until 740 and subtract from 1.

So, the final probability value = 1 - 0.9732 = 0.0268 or 2.68%.

3. P(600

In this case, we need to find the value of probability at X<720 and X<600 and subtract both values.

When X = 720, z = 1.29 and probability value is 0.9015

When X = 600, z = -2.58 and probability value is 0.00494

Final probability value = 0.9015 – 0.00494 = 0.89656 or 89.656%.

4. P(X=720)

This question can be approached with 2 methods:

Method 1:

The above formula is the equation for normal distrinution. If we compute our values in the formula, answer would be

0.029 which is approximately 0

Method 2:

$P(Z = 1.29) = P(1.29 < Z < 1.29)$

Since, our primary aim is to compute the area of the curve whether it is to the left or right depends on its position and if it is greater or lesser.

Hence, being a single line the area enclosed by it is Zero.

P(Z = 1.29) = P(Z < 1.29) - P(Z < 1.29)

P(Z = 1.29) = 0.9032 - 0.9032

P(Z = 1.29) = 0.

5)Explain the curve on the right side.

The given curve is the “Normal Distribution curve” for the random variable and the percentage is the“Standard Deviations” from the mean. The distribution in the curve is perfect without any skewness. The Normal Distribution is a probability function that describes how the values of a variable are distributed. It is an asymmetric distribution where most of the observations cluster around the central peak and the probabilities for values further away from the mean taper off equally in both directions.

1s.d from the mean is around 34.1 on either side of the mean and hence the values lie b/w -34.1% and 34.1% = 68.2% of values fall in the 1 S.D

2s.d from the mean is taken as 34.1+34.1+13.6+13.6= 95.4% approximately the values flase in the 2S.D from the mean.

3s.d from the mean is taken as 34.1+34.1+13.6+13.6+2.1+2.1 = 99.7% approximately the values fall in the 3S.D from the mean.

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