Alex White

MCQ5, August 2, 2015

CS780: Genetic Algorithms, Queens College

Prepared for Professor Goldberg

1. Central tendency says that:
   1. Values in a distribution tend toward its average
   2. There are multiple measures of average
   3. The dispersion of a set is limited
   4. The median will always be the same as the mode
   5. The more values in set, the more they will be centralized

ANSWER: A. The center of a mass of a distribution tends to be in its middle.

1. A histogram is a:
   1. Graph that plots an exponential curve
   2. Measurement of the standard deviation
   3. One of the five important statistical measurements
   4. A graph which plots the distribution of values in a set
   5. A picture that is in black and white

ANSWER: D. A histogram shows how many values in a set appear in each of a set of ranges

1. The arithmetic mean of a set is:
   1. The probability of randomly choosing the mean in a set
   2. The central value in a set
   3. The total divided by the count
   4. The frequency of the most common value
   5. The value of the most common value

ANSWER: The total of the values in a set divided by the number of values in it.

1. The expected value of an outcome is:
   1. How often you would expect to find it
   2. The total number of instances of that value
   3. The sum of the total instances of that value
   4. The location of that value in the set’s histogram
   5. Its value multiplied by its probability

ANSWER: E. The expected value is the size of that value tempered by the probability of achieving it.

1. The kurtosis of a normal curve is:
   1. The total number of values in it.
   2. Its average
   3. Its ‘peakiness’
   4. Its normalized standard deviation
   5. Its shape

ANSWER: C. The size of its peak relative to the thickness of its wings.

1. The law of large numbers states that as the number of trials increases:
   1. The average of the outcomes approaches their expected value
   2. The kurtosis increases
   3. You are more likely to achieve every outcome
   4. The number of possible outcomes increases
   5. The chance of achieving an outlying result dwindles

ANSWER: A. The more trials take place, the likelier it is that their average approaches what was expected.

1. The central limit theorem says that regardless of the underlying distribution:
   1. The maximum value approaches a limit
   2. The shape of the curve becomes exponential over time
   3. You cannot always achieve a normal distribution
   4. Given a large number of independent random variables, their mean will aproach a normal distribution
   5. The normal distribution will always look like a Gaussian curve

ANSWER: D. The average of a number of random variables tends to be shaped like a normal distribution.

1. The variance measures, in lay terms:
   1. Average distance from the mean.
   2. The frequency of the most common value
   3. The range of the distribution
   4. The integral of the normal curve.
   5. The expected value of the average case.

ANSWER: A. The variance approximates how wide the distribution of the common vaues is.

1. The standard deviation of a set is:
   1. The fourth central moment of a distribution
   2. A standard distance from its mean
   3. The square root of the variance.
   4. The skew of a distribution.
   5. Both B and C

ANSWER: E. The standard deviation is a measurement of a standard distance from the mean, quantified as the square root of the set’s variance.

1. The null hypothesis is the assumption, absent any analysis, that:
   1. It is impossible to achieve the same result twice.
   2. The results of an experiment are not related to any underlying phenomenon
   3. The results of an experiment *are* related to an underlying phenomenon.
   4. There is no such thing as a true random number generator.
   5. The likelihood of achieving a result is proportional to its expected value.

ANSWER: B. We begin an experiment assuming that there is no relationship, and can only reject this assumption if there is sufficient statistical information to do so.