1. Define the Bayesian interpretation of probability.

Ans: It states that each and every random varibale indivisual or depended on other varibale. In short term it says suppose we have two random varibale A and B so formula of that.

P(A|B) = (P(B|A) \* P(A)) / P(B)

P(A|B) menas probability of A when B is given and P(B|A) is probability of B when A is given and P(A), P(B) is probabilty of A and B. So this theorm gives evidance to find out probability of one random varibale when we have many randowm varibale in an Event.

2. Define probability of a union of two events with equation.

Ans: Supoose we have two events that are A and B so we can define A U B i.e A union B.

A U B = P(A) + P(B) – P(A∩B)

Here P(A) is probability of A and P(B) is probabilty of B and P(A∩B) menas area or out come where niether A and B present togather.

3. What is joint probability? What is its formula?

Ans: It refers to join probabilty of two or more events i.e when two events occur simultaneosly. To calculate probability of A and B we use this formula

P(A, B) = P(A ∩ B)

Where P(A ∩ B) mean probability of A intersection B events. And join probabilty is multiplication of two or more independed events.

P(A, B) = P(A) x P(B)

4. What is chain rule of probability?

Ans: This rule gives us joint probabily of multiple events ocurring simultaneously. i.e if we gave three event then probabilty of A is P(A) Becuase this is first event but P(B) is depent on P(A) In simple way it also joint probabily for n numbers of event and we also says this general Product rule and formula for that is

P(A1 and A2 and ... and An) = P(A1) \* P(A2 | A1) \* P(A3 | A1 and A2) \* ... \* P(An | A1 and A2 and ... and An-1)

5. What is conditional probability means? What is the formula of it?

Ans: This gives probability of event A given by event B which is already occured. In short team any event probability which is depended on previous event and formula of this.

P(A|B) = P(A and B) / P(B)

6. What are continuous random variables?

Ans: It is a range of outcome of any event which is continuous i.e when we have continuous outcome of any event suppose choosing hight of any person among complete peoplation that is continuous random varibale. Remember one thing this always have one range. Out come of tossing coin is discreat random variable.

7. What are Bernoulli distributions? What is the formula of it?

Ans: This is discreat probability distribution It mean outcome of every event is fixed like True or False so and this is for binary outcome. If we have multiple binary events togather then we call this binomial distribution. PMF for this

P(X = x) = p^x \* (1-p)^(1-x)

Where X is Random Variable at both condition x=0,1 i.e failure and success and p is probabilty od success abd 1-p is probability of failure

The expected value or mean of the Bernoulli distribution is given by:

E(X) = p

which represents the average value of the random variable over many trials. The variance of the Bernoulli distribution is given by:

Var(X) = p\*(1-p)

Which is spreadness or variance od R.V X.

8. What is binomial distribution? What is the formula?

Ans: Similare to bernouli when we have many bernouli ditribution i.e many binary events togather then we call this Binomial Dist.

P(X = k) = (n choose k) \* p^k \* (1-p)^(n-k)

Where P(X = k) is the probability of getting exactly k successes in n trials

n is the total number of trials

k is the number of successes

p is the probability of success for each trial

(n choose k) is the binomial coefficient, which represents the number of ways to choose k items from a set of n items and is calculated as: n! / (k! \* (n-k)!)

9. What is Poisson distribution? What is the formula?

Ans: This is one kind of continuous distribution which describe probability of certain number of events occuring in a fixed intervel of time or space. The given avarage rate is when event occur and they can occur independely or dependelly. It always have non negetive integer value for number of event This has finite numbers of outcomes.

P(X = k) = (e^(-λ) \* λ^k) / k!

P(X = k) is the probability of k events occurring in the interval

e is the mathematical constant approximately equal to 2.71828

λ is the average rate at which the events occur in the interval

k is the number of events occurring in the interval

k! is the factorial of k, which represents the number of ways to arrange k distinct objects in a sequence and is calculated as: k! = k \* (k-1) \* (k-2) \* ... \* 1

Suppose we are getting 10 call on mobile at every hour so 10 is avarage rate and 1 is interval

10. Define covariance.

It define linear relationship between two variables i.e how both varibale symmetrical to eatch other but does not have any limit so we can’t use this for feature selection because it does not have limit so we can’t set threshold for any varibale.

cov(X, Y) = E[(X - E[X]) \* (Y - E[Y])]

11. Define correlation.

Ans: It define linear relationship between two variables i.e how both varibale symmetrical to eatch other but that in standardize i.e this has limit of -1 to +1.

corr(X, Y) = cov(X, Y) / (sd(X) \* sd(Y))

12. Define sampling with replacement. Give example.

Ans: It says that select sample from population then return this sample to population again and do sampling so you have equal chances to get new or old smaple again so your smaple data may have differnrt or same sample again. For example you have 5 ball in bag and you select any random ball and not the colour or number of this ball and return this ball to bag and again select any ball so you have chnace to get same ball then your both smaple have same or different values.

13. What is sampling without replacement? Give example.

This is opposite of above i.e onec you select or take sample from population and if you again collect sample but that time you did not return old sample so chances of comming old values become zero for example you have 5 ball in bag with differnt color and you pulled one ball now remaing balls are 4 so if you do again sapling then there is no chnaces to get same color ball again

14. What is hypothesis? Give example.

Ans: nature of population where we can perform any test to prove that wrong or write. In simple words collect sample data from population data to draw some relation or get some coclusion or it is educated pridiction from some amout of data that can be tested.