Hello students myself Sneha Dessai assistant

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My course title is introduction

to data analytics.

So in this we are going to

learn about fitting or model.

Outline for today's topic is fitting a

model under that using binomial distribution,

poisson distribution, and normal distribution.

So at the end of this session students

will be able to learn how to fit a

model using each of these examples.

What do you mean by fitting a model?

So when we talk about fitting a model it is,

it means that we estimate the parameters

of the model using the observed data.

So fitting model involves optimization

methods and algorithms such as

maximum likelihood estimation

to help get the parameters.

So in fact, when we estimate the parameters, they are actually estimators,

meaning they they themselves

are the functions of data.

So once you fit the model,

we actually can write a line of

equation is Y is equal to 7.2 + 4.5 X.

This is nothing but a simple slope and

intercept form of a line equation,

which means that our best guess is

that in this equation or a functional

form of express or functional

form which expresses the.

Relationship between our two variables,

that is X&Y.

So using the value of X we

can determine the value of Y,

so predicting Y based on X.

That we can do by fitting a model

to a particular line equation.

So based on our assumption of value of X,

we will be able to compute value Y.

So binomial distribution.

First,

we are learning fitting a model

using binomial distribution.

So when sampling we commonly want

to accept a particular batch.

If they say there is a one or less

defective elements in the sample,

or reject if there are more than

two elements which are defective.

So for that,

in order to determine the

probability of acceptance,

we have individual probabilities and

zero and one that is probability of

acceptance and probability of rejection.

So if the probability the

defectives are summed as P1 or less,

it is equal to P OF0P of one

for a particular problem.

It can be the probability of 0 is

0.358 and probability of one is 0.377.

So total it is 0.735.

So here,

probability of rejection will be

what 1 -- 0.735 which is 0.265?

Second example again using

binomial distribution.

So if you toss a coin 20 times,

what is the probability of

getting two or fewer heads

It's so here we have to apply that

formula of binomial distribution

that is N factorial upon N

factorial minus NCR N

factorial and minus R factorial.

So it is 20 factorial in first case

when your number of heads is 0.

You get 20 factorial upon 20

factorial into 0 factorial and .5.

That is the probability of

getting head is half right?

So that's where it is .5 raised to 20.

That is our value.

Next up.

Probability is,

it is when you get one

hits. So for one head of the value

will be computed using NCR and NC one.

Then one factorial NR 21

that is 19 factorial.

The next value will be computed as NCR,

that is, your R value is 2.

There are two heads,

so here 2 heads means 20 factorial upon.

18 factorial that is 20 -- 218

factorial into 2 factorial and

remaining things will remain the same.

So the final probability value,

which we will get is 1.8 into 10 raised to -- 4.

Next is fitting a model

using poison distribution.

So suppose if you have a question like

the average number of accidents at a

particular intersection every year is 18.

Then calculate the probability that

there exists exactly 2 accidents

in that particular month so.

When you talk about someone month,

there are 12 months in a year,

so your Lambda will be 18 / 12 .

So it is like the average number

of accidents.

At a particular intersection,

every year is 18,

so 18 / 12 within a month.

It can be like 1.5 accidents per month.

So poison distribution here formula

is P is equal to X equal to 2 E raised

Lambda Lambda raised to X&X factorial.

So your Lambda value is 1.5.

We have to substitute that in this

particular formula and X value

we are finding for two accidents.

So 1.5 you cannot consider 1.5 right?

So it should be 2 and that's

why you get value at 0.2510.

Next is normal distribution.

Example how to filter model

using normal distribution?

So in this example is if X is

a normal variant with mean 30

and standard deviation is 5.

Find the probability that X will lie

between 20 and 40 or X is greater than 45,

so the normal distribution formula is

given as Z is equal to X minus MU upon

Sigma where MU is the population mean

and Sigma is a population standard deviation.

So here the values are given

as X equal to 20.

Then there is equal to.

20 -- 30 / 5 so it comes as

-2 and then X is 40.

So the first part of the problem we have to check whether X lies between 20 and 40.

So the first value is 20.

So we get value of Z variant as

-2 and when we substitute value

40Z variant value is equal to 2.

So what is the probability that

it will lie between 20 and 40?

It is some of both these probabilities so.

It is by symmetry, both values are equal,

so if you directly add them,

what will happen,

you will get probability value zero,

which shouldn't happen.

So by symmetry your probability

of of minus 20 will lie between

two and zero and probability that

Z will lie between zero and two

is nothing but two times.

Probability will lie between zero

and two by symmetry property,

so that's why you get 2 into 0.4722.

And the final value that you

receive from the table is 0.9544.

This 0.4772 you have to find from the

normal distribution table and using

that value you compute the final value,

that is 0.949544.

Another part of this problem was whether

when your X is greater than or equal to 45.

So at that time you have to

substitute in place of X.

We have to substitute 45 and population

mean is 30 divided by Standard Deviation,

which is 5. So you get value 3.

So what is the probability that Z

will lie greater than equal to three?

It is nothing but .5 minus probability

will lie between zero and three,

so this value of probability that Z variant

will lie between zero and three is 0.4987.

from the normal distribution table

and you have to subtract it from .5 so

the final value that you get is 0.0013.

So these are my references.

Thank you.