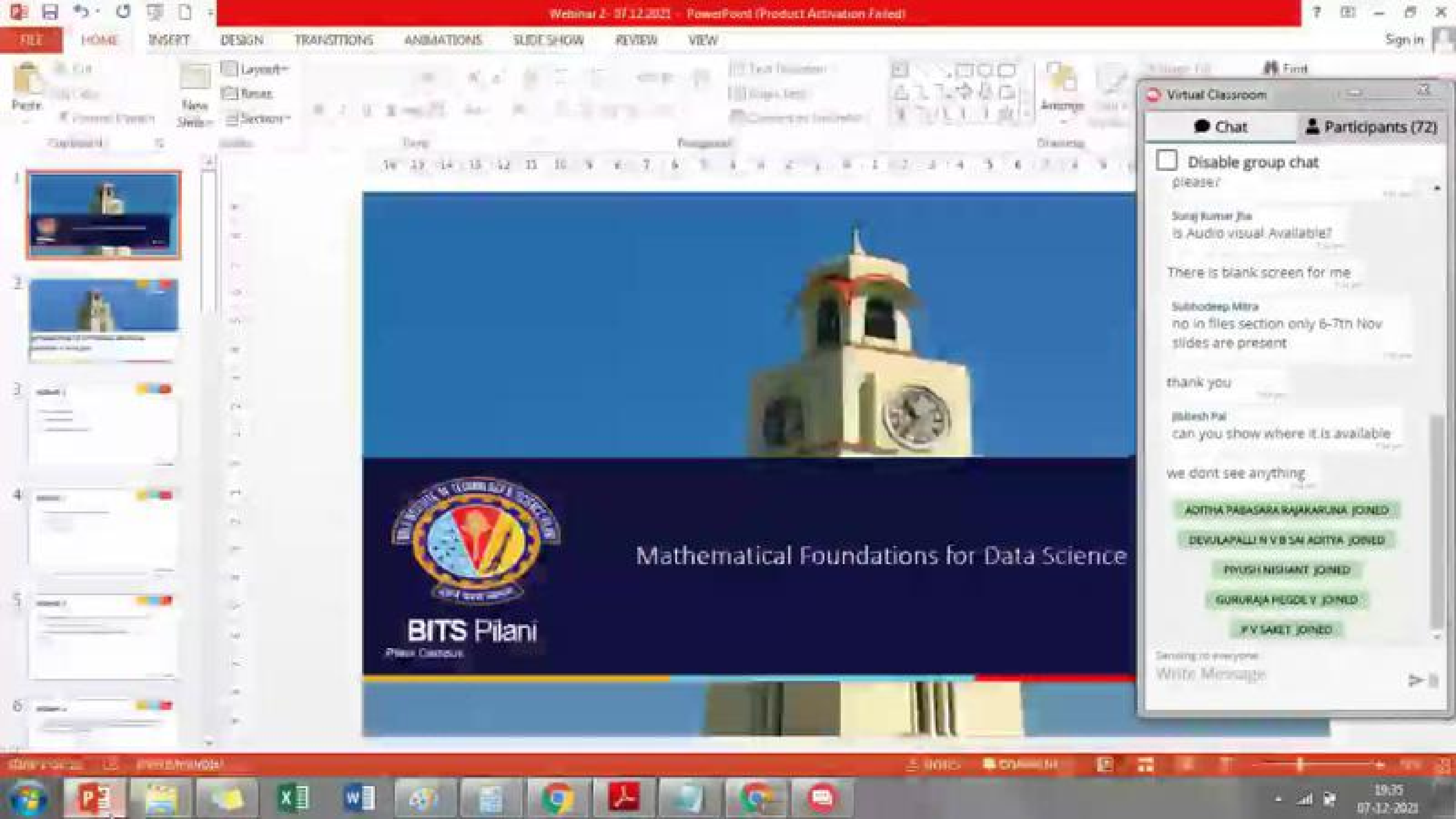

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Suraj Kumar Jha
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Subhodeep Mitra
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thank you
Jibitesh Pal
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ADITHA PABASARA RAJAKARUNA JOINED
DEVULAPALLI N V B SAI ADITYA JOINED
PIYUSH NISHANT JOINED
GURURAJA HEGDE V JOINED
P V SAKET JOINED
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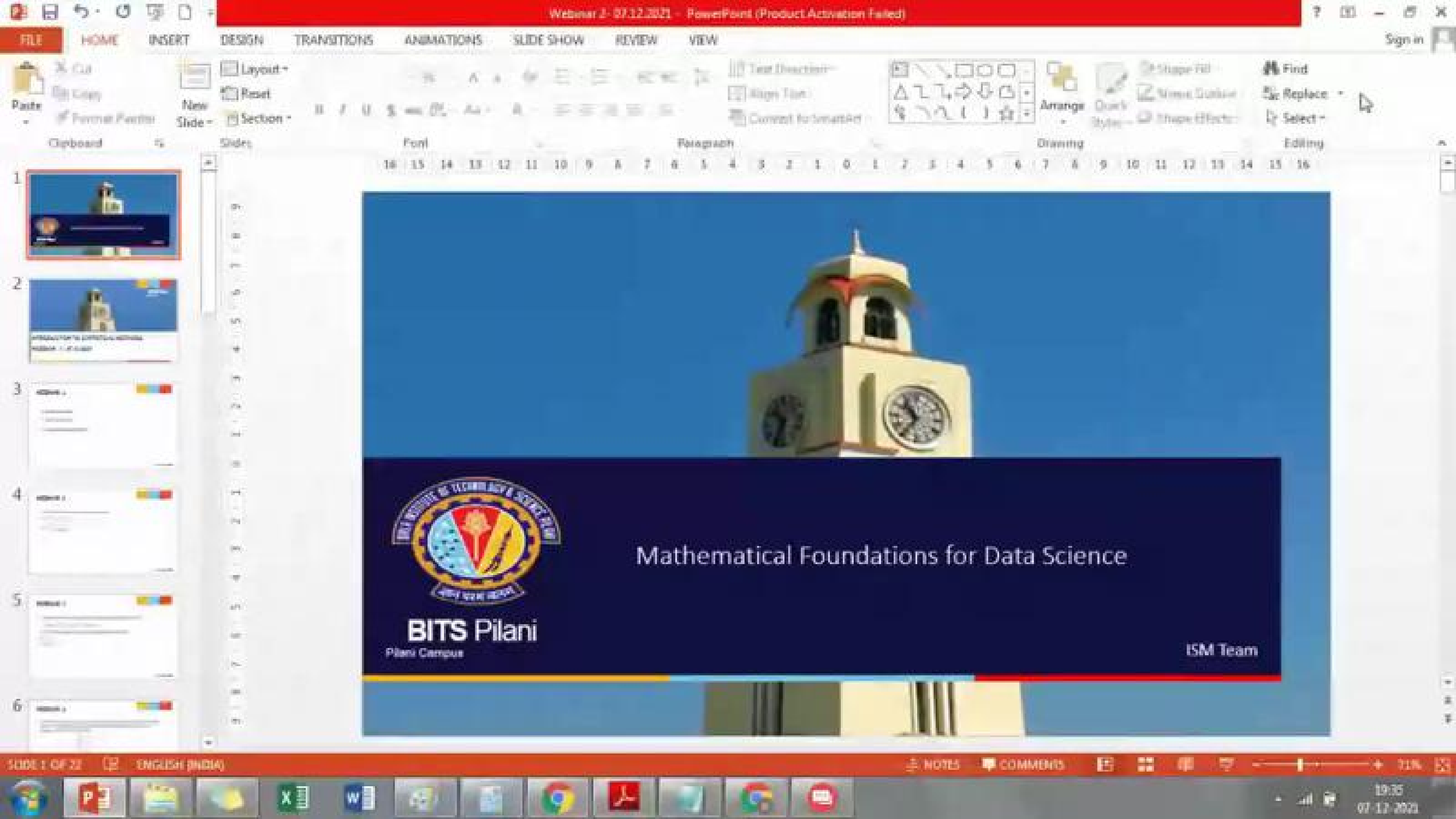
Pilani Campus
19:35
07-12-2021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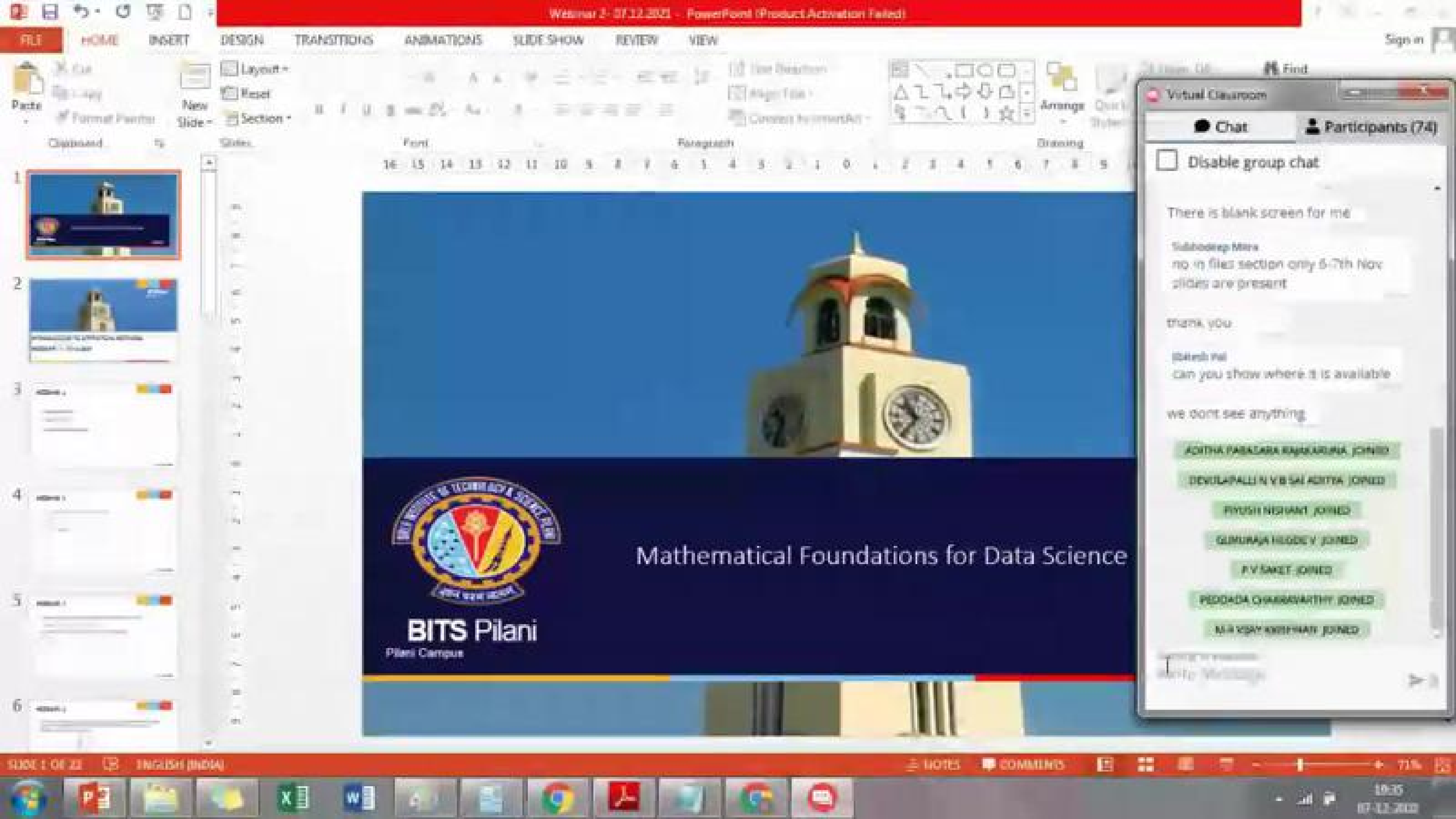

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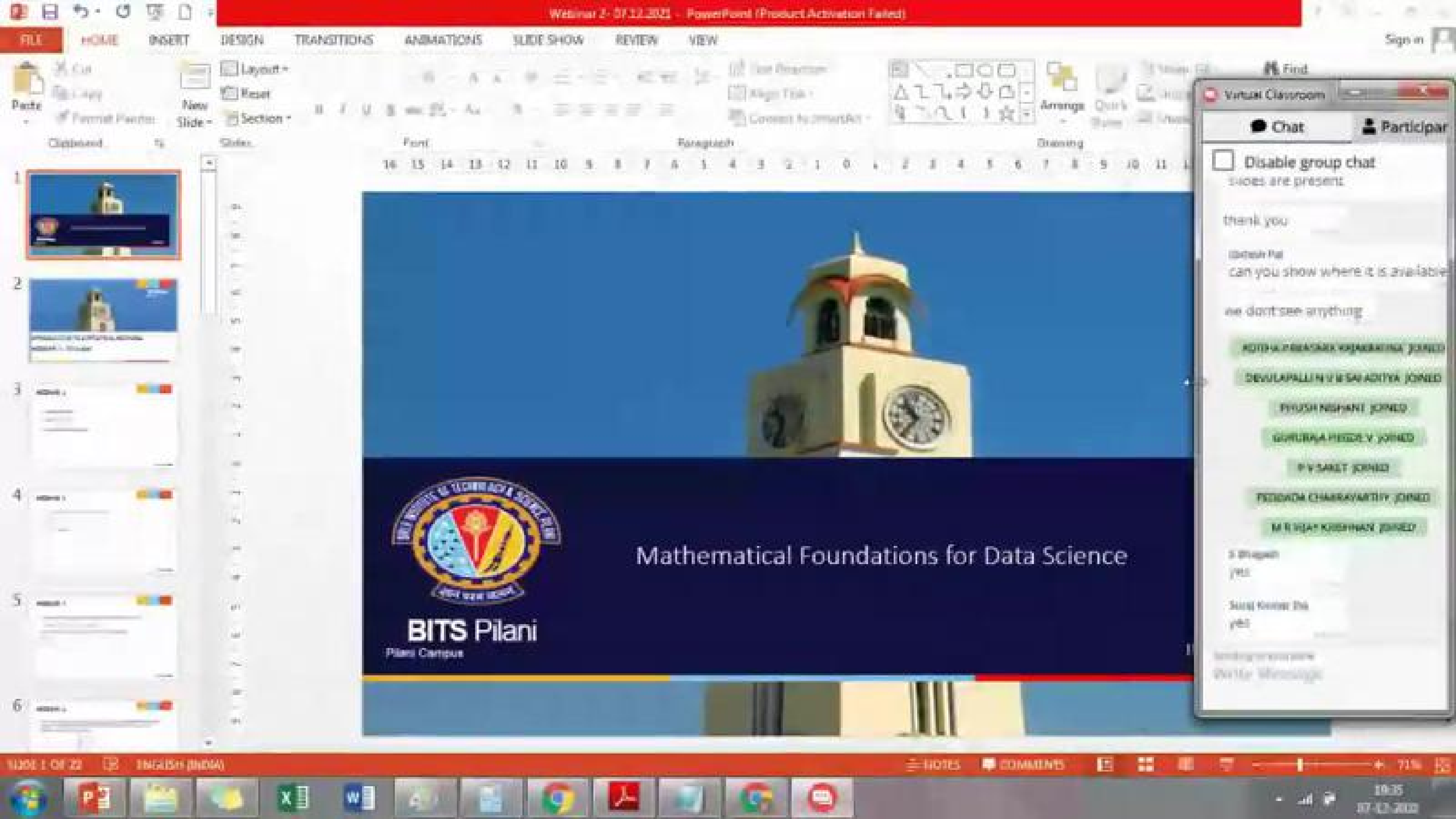
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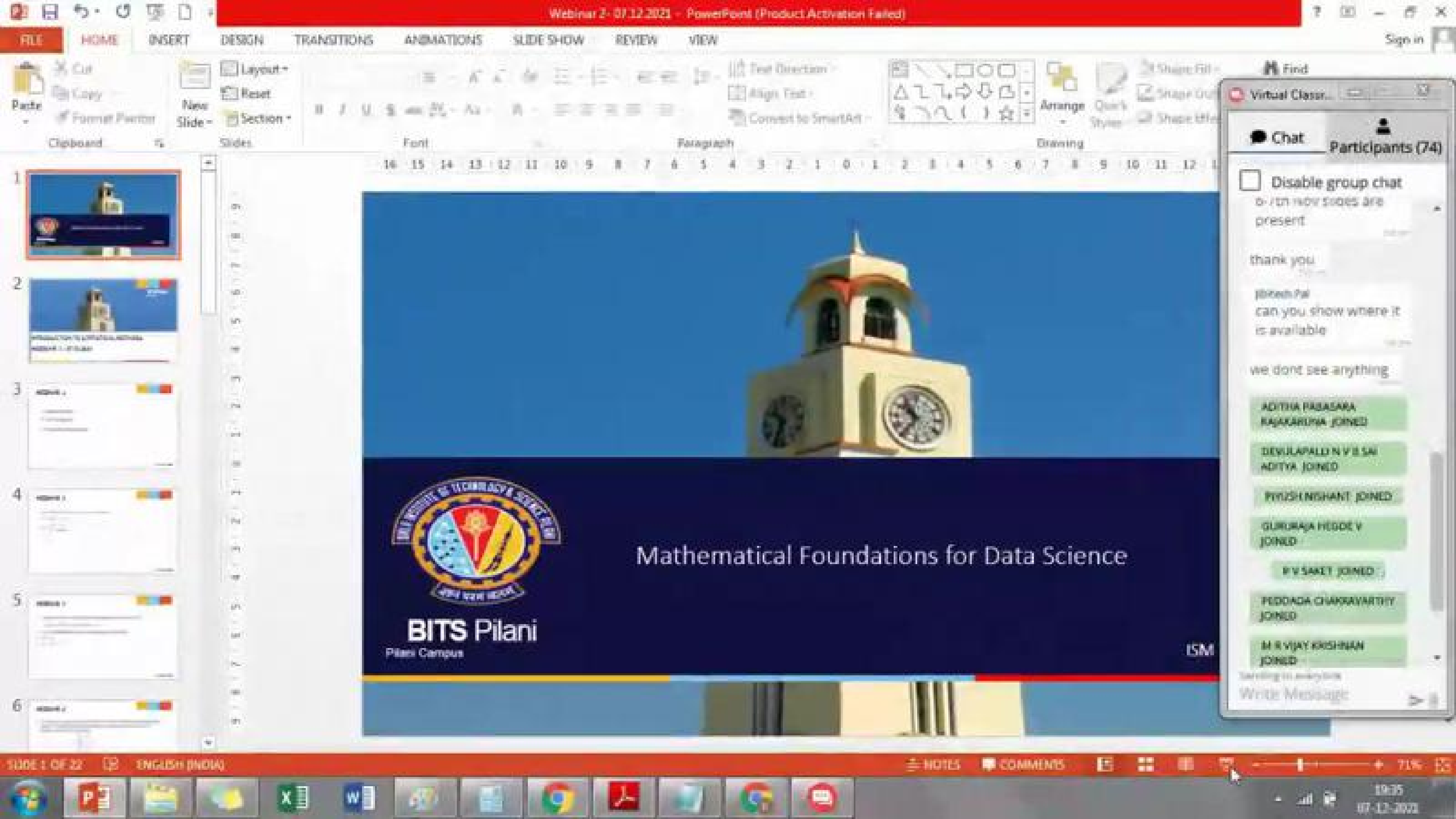
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we dont see anything
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ENGLISH (INDIA)
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PIYUSH NISHANT JOINED

GURURAJA HEGDE V JOINED

P V SAKET JOINED

PEDDADA CHAKRAVARTHY JOINED

M R VIJAY KRISHNAN JOINED

S Bhagath: yes

Suraj Kumar...: yes

Smita Ranjan: where was the question set posted? might have missed communication

S J Krishna Kasibhotla: ma'am is this MFDS ?

Sending to everyone

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Smita Ranjan
where was the question set posted? might have missed communication

S J Krishna Kasibhotla
ma'am is this MFDS ?

RAJESH KUMAR PANDEY JOINED

S Bhagath
yes ma'am..

Prakash Ku...
right

HARIKRISHNA PALADI JOINED

RABINDRA HARLALKA JOINED

Gotala Meghana
yes yes its just the heading

Write Message


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S Bhagath
yes ma'am...
right
HARIKRISHNA PALADI JOINED
RABINDRA HARLALKA JOINED
Gutala Meghana
yes yes its just the heading
Your slide says MFDS
On slides it's written MFDS
Suraj Kumar Jha
Slide says MFDS
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INTRODUCTION TO STATISTICAL METHODS

WEBINAR 4 : 07.12.2021

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yes yes its just the heading
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Slide says MFDS
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INTRODUCTION TO STATISTICAL METHODS

WEBINAR 4 : 07.12.2021

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RABINDRA HARLALKA JOINED

Gutala Meghana
yes yes its just the heading

Seelam Reshma Monica
Your slide says MFDS

Veldur Samantaka Rajkiran
On slides it's written MFDS

Suraj Kumar Jha
Slide says MFDS

NEERAJ SABHNANI JOINED

Gunasekaran R
The slide shows MFDS

Suraj Kumar...
yes

GAURAV ANAND JOINED

Sending to everyone

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WEBINAR 2

- Random Variables
- Joint Distribution
- Family of Random Variables

WEBINAR 2

- Random Variables
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WEBINAR 2

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WEBINAR 2

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WEBINAR 2

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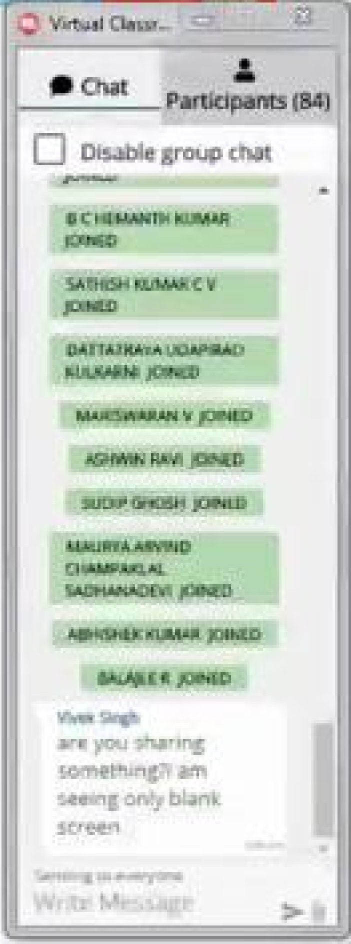
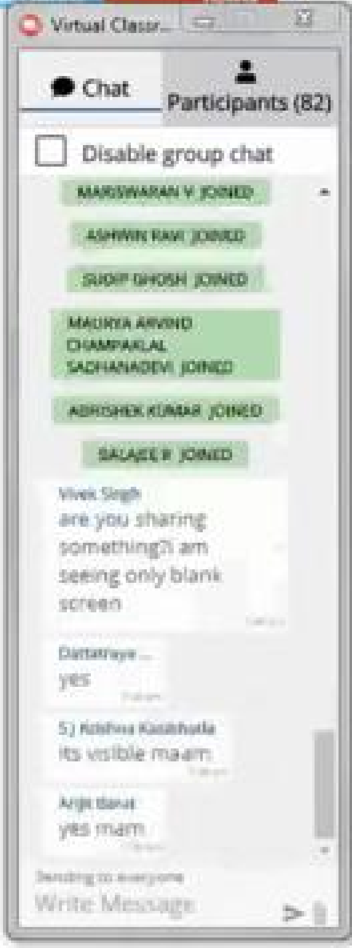


WEBINAR 2

- Random Variables
- Joint Distribution
- Family of Random Variables

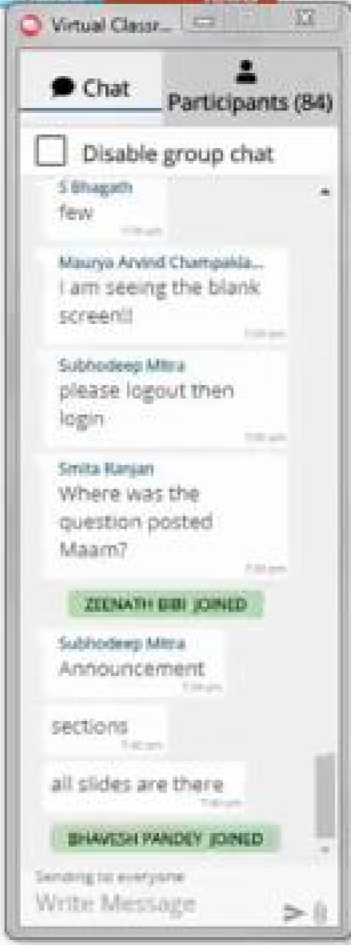


WEBINAR 2

- Random Variables
- Joint Distribution
- Family of Random Variables

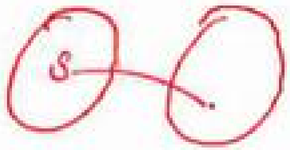
WEBINAR 2

- Random Variables $f: S \to R$
- Joint Distribution
- Family of Random Variables

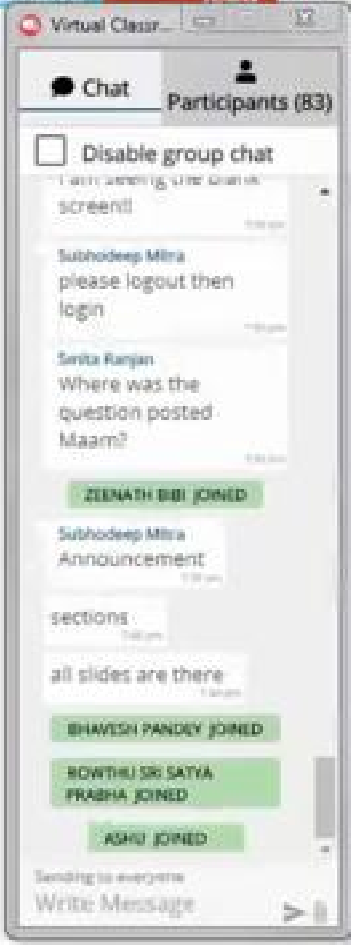


WEBINAR 2

- Random Variables $f: S \to R$

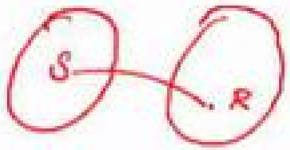


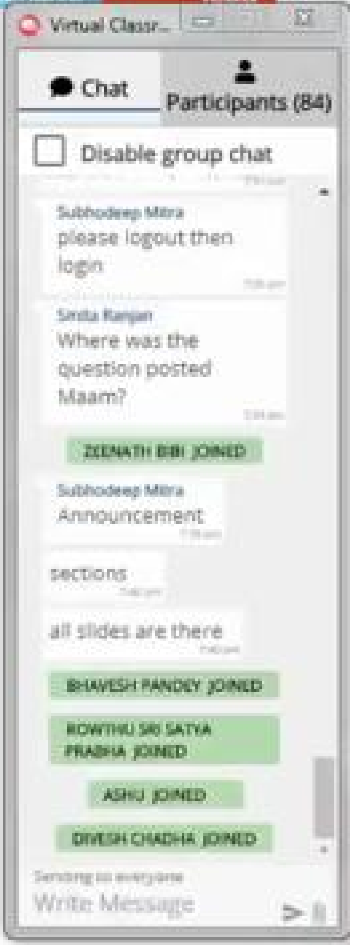
- Joint Distribution
- Family of Random Variables



WEBINAR 2

- Random Variables $f: S \to R$
- Joint Distribution
- Family of Random Variables





WEBINAR 2

1. Check whether the following can serve as probability distributions:

a. $f(x) = \dfrac{x-2}{2};\ x = 1,2,3,4$

b. $f(x) = \begin{cases} 2e^{-2x}; & x \geq 0 \\ 0 & \text{otherwise} \end{cases}$

WEBINAR 2

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WEBINAR 2

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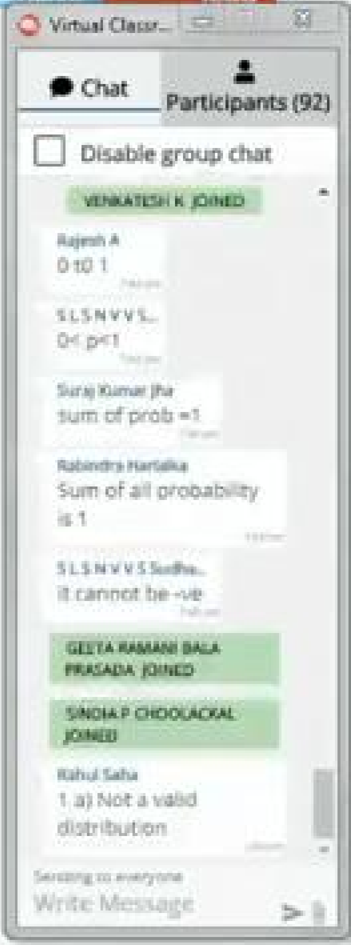

WEBINAR 2

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b. $f(x) = \begin{cases} 2e^{-2x}; & x \geq 0 \\ 0 & \text{otherwise} \end{cases}$

→ Valid

1. $f(x) \geq 0$ for every $x \geq 0$

WEBINAR 2

Discrete - Sum
Continuous - $\int$

1. Check whether the following can serve as probability distributions: → Prob

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→ Valid

1. $f(x) \geq 0$ for every $x \geq 0$
2. $\int_{-\infty}^{\infty} f(x)\,dx = 1$

WEBINAR 2

Discrete - Sum
Continuous - $\int$

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→ Valid

1. $f(x) \geq 0$ for every $x \geq 0$

2. $\int_{-\infty}^{\infty} f(x)\,dx = 1$

$$\int_0^{\infty} 2e^{-2x}\,dx = \int$$

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Arijit Barat: integration

HARSH VASHISHT JOINED

M R Vijay Krishnan: if x=2 the value becomes 2 right

?

MANURAJ BHARALI JOINED

Bhimsen Joshi: x = 0, fx = 2?

M R Vijay Kris...: sorry x=0

2nd one

Bhimsen Joshi: b...

HIMALI AGARWAL JOINED

Sending to everyone

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WEBINAR 2

Discrete - Sum
Continuous - $\int$

1. Check whether the following can serve as probability distributions: → Prob

a. $f(x)=\dfrac{x-2}{2};\ x=1,2,3,4$ — Not valid Prob $x=1,\ f(1)=-\frac{1}{2}$ (-ve)

b. $f(x)=\begin{cases}2e^{-2x} & x\geq 0\\ 0 & \text{otherwise}\end{cases}$

→ Valid

1. $f(x)\geq 0$ for every $x\geq 0$

2. $\int_{-\infty}^{\infty} f(x)\,dx=1$

$\int_{0}^{\infty} 2e^{-2x}\,dx = \int 2\,e^{-}$

WEBINAR 2

Discrete - Sum
Continuous - $\int$

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a. $f(x) = \frac{x-2}{2}$; x=1,2,3,4 — Not valid Prob $x=1,\ f(1) = -\frac{1}{2}$ (-ve)

b. $f(x) = \begin{cases} 2e^{-2x} & x \geq 0 \\ 0 & \text{otherwise} \end{cases}$

→ Valid

1. $f(x) \geq 0$ for every $x \geq 0$

2. $\int_{-\infty}^{\infty} f(x)\, dx = 1$

$$\int_0^{\infty} 2e^{-2x}\, dx = \left[2\frac{e^{-2x}}{-2} \right]$$

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MANURAJ BHARALI JOINED

Bhimsen Joshi: x = 0, fx = 2?

M R Vijay Kris...: sorry x=0

2nd one

Bhimsen Joshi: b...

HIMALI AGARWAL JOINED

Rabindra Harlalka: For x = 0, f(x) = 2, how is that valid?

Seelam Reshma Monica: in b, for x=0, f(x) becomes 2 which is greater than 1, so its not valid

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WEBINAR 2

Discrete - Sum
Continuous - $\int$

1. Check whether the following can serve as probability distributions: → Prob

a. $f(x) = \frac{x-2}{2}$; $x = 1,2,3,4$ — Not valid Prob $x = 1,\ f(1) = -\frac{1}{2}$ (-ve)

b. $f(x) = \begin{cases} 2e^{-2x} & x \geq 0 \\ 0 & \text{otherwise} \end{cases}$

→ Valid

1. $f(x) \geq 0$ for every $x \geq 0$

2. $\int_{-\infty}^{\infty} f(x)\,dx = 1$

$$\int_0^{\infty} 2e^{-2x}\,dx = \left[2\frac{e^{-2x}}{-2} \right]_0^{\infty} = 1$$

$$[-e^{-\infty} - (-1)] = 1$$

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problem b

Bhimsen Joshi
For b...is it ok if f(0) = 2???

S Bhagath
f(x) >=0, not between 0 & 1..

Bhavesh Pandey
then also it will be greater than 1

GIRIDHARY KUMAR TAMULI JOINED

Rahul Saha
b) is invalid

Raghavendr...
it is -1

S Bhagath
0-(-1)

SARAVANAN J JOINED

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Discrete - Sum
Continuous - $\int$

1. Check whether the following can serve as probability distributions: → Prob

a. $f(x) = \dfrac{x-2}{2}$; $x = 1,2,3,4$ — Not valid prob $x = 1,\ f(1) = -\frac{1}{2}$ (-ve)

b. $f(x) = \begin{cases} 2e^{-2x} & x \geq 0 \\ 0 & \text{otherwise} \end{cases}$ ≥ 0 > 0

→ Valid

1. $f(x) \geq 0$ for every $x \geq 0$

2. $\int_{-\infty}^{\infty} f(x)\,dx = 1$

$$\int_0^{\infty} 2e^{-2x}\,dx = \left[2\frac{e^{-2x}}{-2} \right]_0^{\infty} = 1$$

$$\left[-\cancel{e^{-\infty}}^{\,0} - (-1) \right] = 1$$

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0-(-1)
SARAVANAN J JOINED
SANDIP SARKAR JOINED
M R Vijay Kri...
yes
Bhimsen Joshi
Problem b seems to be invalid
SEELAM RESHMA MONICA JOINED
KARTHIK P JOINED
GUTALA MEGHANA JOINED
AGASTYA RAMANI KRISHNA KUMAR JOINED
S L S N V V S SUDHAKAR JOINED
For 0 it is 2
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Discrete - Sum
Continuous - $\int$

1. Check whether the following can serve as probability distributions: → Prob

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$$\int_0^{\infty} 2e^{-2x}\,dx = \left[2\frac{e^{-2x}}{-2} \right]_0^{\infty} = 1$$

$$\left[-e^{-\infty} - (-1)\right] = 1$$

Note:

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SARAVANAN J JOINED

SANDIP SARKAR JOINED

M R Vijay Kri...
yes

Bhimsen Joshi
Problem b seems to be invalid

SEELAM RESHMA MONICA JOINED

KARTHIK P JOINED

GUTALA MEGHANA JOINED

AGASTYA RAMANI KRISHNA KUMAR JOINED

S L S N V V S SUDHAKAR JOINED

For 0 it is 2

How is it possible?

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Discrete - Sum
Continuous - $\int$

1. Check whether the following can serve as probability distributions: → Prob

a. $f(x) = \dfrac{x-2}{2}$; $x = 1,2,3,4$ — Not valid Prob $x = 1,\ f(1) = -\frac{1}{2}$ (-ve)

b. $f(x) = \begin{cases} 2e^{-2x} & x \geq 0 \\ 0 & \text{otherwise} \end{cases}$ ≥ 0 > 0

→ Valid

1. $f(x) \geq 0$ for every $x \geq 0$

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Note:

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M R Vijay Kr...
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Bhimsen Joshi
Problem b seems to be invalid
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KARTHIK P JOINED
GUTALA MEGHANA JOINED
AGASTYA RAMANI KRISHNA KUMAR JOINED
S L S N V V S SUDHAKAR JOINED
For 0 it is 2
How is it possible?
AMOGH SINGHAL JOINED
Sending to everyone
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WEBINAR 2

2. A random variable X is having probability distribution function is given by

$$f(x) = \frac{e^{-k}k^{x}}{x!},\ x = 0,1,2,3\ldots \text{with } k = 2$$

a. Is it a valid distribution? Justify. If valid then find the following

b. $P(x > 2)$

c. $P(1 < x < 3)$

WEBINAR 2

2. A random variable X is having probability distribution function is given by

$$f(x) = \frac{e^{-k}k^{x}}{x!},\ x = 0,1,2,3\ldots \text{with } k = 2$$

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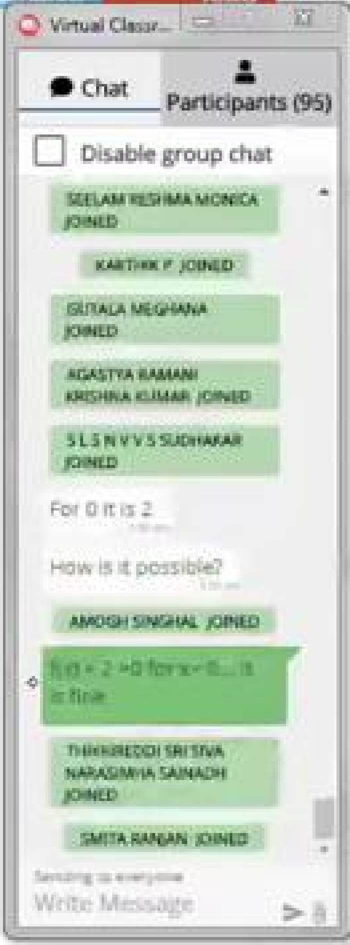

WEBINAR 2

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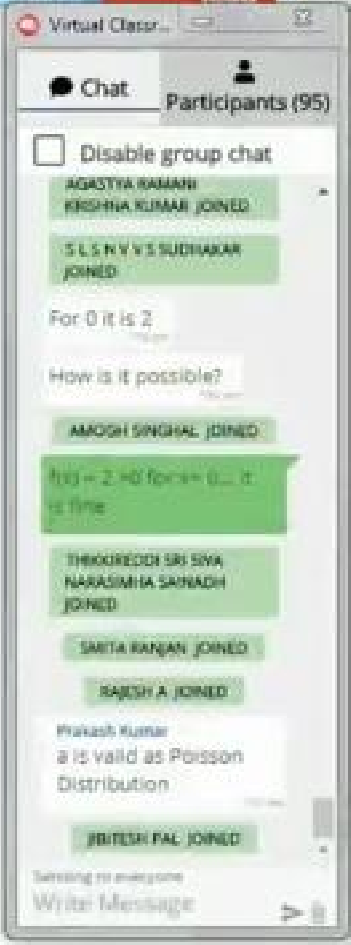


WEBINAR 2

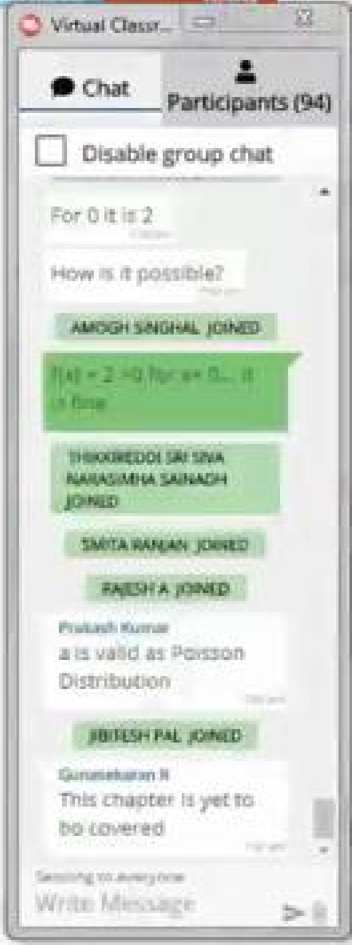
2. A random variable X is having probability distribution function is given by

$$f(x) = \frac{e^{-k}k^{x}}{x!}, \text{x} = 0,1,2,3\ldots \text{with k} = 2 \qquad \frac{e^{-\lambda}\lambda^{x}}{x!}$$

a. Is it a valid distribution? Justify. If valid then find the following

b. P(x > 2)

c. P(1 < x < 3)



WEBINAR 2

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$$\frac{e^{-\lambda}\lambda^{x}}{x!}$$

a. Is it a valid distribution? Justify. If valid then find the following

(i) $f(x) \geq 0$

(ii) $\sum_{x=0}^{\infty} \frac{e^{-2}2^{x}}{x!} = e^{-}$

b. $P(x > 2)$

c. $P(1 < x < 3)$

WEBINAR 2

2. A random variable X is having probability distribution function is given by

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$$\frac{e^{-\lambda}\lambda^{x}}{x!}$$

a. Is it a valid distribution? Justify. If valid then find the following

(i) $f(x) \geq 0$

(ii) $\sum_{x=0}^{\infty} \frac{e^{-2}2^{x}}{x!} = \frac{e^{-2}2^{0}}{0!} + e^{-2}$

b. $P(x > 2)$

c. $P(1 < x < 3)$

WEBINAR 2

2. A random variable X is having probability distribution function is given by

$$f(x) = \frac{e^{-k}k^{x}}{x!},\ x = 0,1,2,3\ldots \text{with } \boxed{k = 2}$$

$$\frac{e^{-\lambda}\lambda^{x}}{x!}$$

a. Is it a valid distribution? Justify. If valid then find the following

(i) $f(x) \geq 0$

(ii) $\sum_{x=0}^{\infty} \frac{e^{-2}2^{x}}{x!} = \frac{e^{-2}2^{0}}{0!} + \frac{e^{-2}2^{1}}{1!} + \frac{e^{-2}2^{2}}{2!} + \cdots$

$= e^{-2}$

b. $P(x > 2)$

c. $P(1 < x < 3)$

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Participants (93)

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Prakash Kumar
a is valid as Poisson Distribution

JIBITESH PAL JOINED

Gunasekaran R
This chapter is yet to be covered

V R LIJU JOINED

Bhavesh Pandey
can u please explain the prove

VANISHREE G JOINED

Gunasekaran R
Why x! instead of 2!

Geeta Ramani Ba...
k=2 and not x

Gunasekara...
Yes mam

Write Message

WEBINAR 2

2. A random variable X is having probability distribution function is given by

$$f(x) = \frac{e^{-k}k^{x}}{x!},\ x = 0,1,2,3\ldots \text{with } \boxed{k = 2}$$

$$\frac{e^{-\lambda}\lambda^{x}}{x!}$$

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b. P(x > 2)

c. P(1 < x < 3)

(i) $f(x) \geq 0$

(ii) $\sum_{x=0}^{\infty} \frac{e^{-2}2^{x}}{x!} = \frac{e^{-2}2^{0}}{0!} + \frac{e^{-2}2^{1}}{1!} + \frac{e^{-2}2^{2}}{2!} + \cdots$

$= e^{-2}\left[\underbrace{1 + \frac{2}{1!} + \frac{2^2}{2!} + \frac{2^3}{3!} \cdots}\right] = e$

WEBINAR 2

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$\frac{e^{-\lambda}\lambda^{x}}{x!}$

a. Is it a valid distribution? Justify. If valid then find the following

(i) $f(x) \geq 0$

(ii) $\sum_{x=0}^{\infty} \frac{e^{-2}2^{x}}{x!} = \frac{e^{-2}2^{0}}{0!} + \frac{e^{-2}2^{1}}{1!} + \frac{e^{-2}2^{2}}{2!} + \cdots$

$= e^{-2}\left[1 + \frac{2}{1!} + \frac{2^2}{2!} + \frac{2^3}{3!} \cdots\right] = e^{-2}(e^{2})$

$= 1$

valid.

b. $P(x > 2)$

c. $P(1 < x < 3)$

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This chapter is yet to be covered

V R LYJU JOINED

Bhavesh Pandey: can u please explain the prove

VANISHREE G JOINED

Gunasekaran R: Why x! instead of 2!

Geeta Ramani Ba...: k=2 and not x

Gunasekara...: Yes mam

S Bhagath: e^2

HAREESH S V JOINED

MALAY DAS SHARMA JOINED

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WEBINAR 2

2. A random variable X is having probability distribution function is given by

$$f(x) = \frac{e^{-k}k^{x}}{x!},\ x = 0,1,2,3\ldots \text{with}\ \boxed{k = 2}$$

$$\frac{e^{-\lambda}\lambda^{x}}{x!}$$

a. Is it a valid distribution? Justify. If valid then find the following

b. P(x > 2)

c. P(1 < x < 3)

(i) $f(x) \geq 0$

(ii) $$\sum_{x=0}^{\infty} \frac{e^{-2}2^{x}}{x!} = \frac{e^{-2}2^{0}}{0!} + \frac{e^{-2}2^{1}}{1!} + \frac{e^{-2}2^{2}}{2!} + \cdots$$

$$= e^{-2}\left[\underbrace{1 + \frac{2}{1!} + \frac{2^{2}}{2!} + \frac{2^{3}}{3!} \cdots}\right] = e^{-2}(e^{2}) = 1$$

Valid.

a) $P(x>2) = P(x=3,4,\ldots)$

$=$.

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VANISHREE G JOINED

Gunasekaran R
Why x instead of 2i

Geeta Ramani Ba...
k=2 and not x

Gunasekara...
Yes mam

S Bhagath
e^2

HAREESH S V JOINED

MALAY DAS SHARMA JOINED

Prakash Kumar
b. 1-p(x<=2)

Anogh Singhal
will these properties and series sums will be provided as part of question ?

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WEBINAR 2

$e^{x} \cdots$

2. A random variable X is having probability distribution function is given by

$$f(x) = \frac{e^{-k}k^{x}}{x!}, \; x = 0,1,2,3\ldots \text{with } \boxed{k = 2}$$

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$= e^{-2}\left[\underbrace{1 + \frac{2}{1!} + \frac{2^2}{2!} + \frac{2^3}{3!} \cdots}\right] = e^{-2}(e^{2})$

$= 1$

Valid.

a) $P(x>2) = P(x=3,4,\ldots)$

$=$

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Yes mam

S Bhagath
e^2

HAREESH S V JOINED

MALAY DAS SHARMA JOINED

Prakash Kumar
b. 1-p(x<=2)

Amogh Singhal
will these properties and series sums will be provided as part of question ?

S Bhagath
1- p(x=0,1,2)

Piyush Nishant
use integration (Definite)

SENTHIL T K JOINED

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$$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \cdots$$

2. A random variable X is having probability distribution function is given by

$$f(x) = \frac{e^{-k}k^x}{x!},\ x = 0,1,2,3\ldots \text{with } \boxed{k = 2}$$

$$\frac{e^{-\lambda}\lambda^x}{x!}$$

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$= e^{-2}\left[\underbrace{1 + \frac{2}{1!} + \frac{2^2}{2!} + \frac{2^3}{3!} \cdots}\right] = e^{-2}(e^{2})$

$= 1$

valid.

a) $P(x>2) = P(x=3,4,\ldots)$

$= 1 - P(x -.$

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Amogh Singhal: will these properties and series sums will be provided as part of question ?

S Bhagath: 1- p(x=0,1,2)

Piyush Nishant: use integration (Definite)

SENTHIL T K JOINED

and limit is 2 to infinity.

Amogh Singhal: ok mam, thanks

Piyush Nishant: Ok Thanks

SHINDE PRITI AGINATH JOINED

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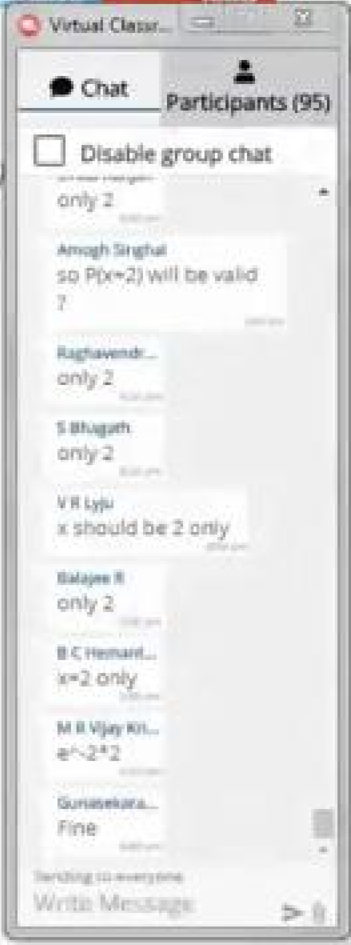
3. An insurance company offers its policyholders a number of different premium pay options. For a randomly selected policyholder, let of months between successive payments. The cdf of X is as follows

$$F(x) = \begin{cases} 0 & x < 1 \\ .30 & 1 \le x < 3 \\ .40 & 3 \le x < 4 \\ .45 & 4 \le x < 6 \\ .60 & 6 \le x < 12 \\ 1 & 12 \le x \end{cases}$$

a. What is the PMF of X?
b. Compute P(3≤ X ≤6)
c. Obtain E(x) and Variance of X.



WEBINAR 2

cumulative - till

$f(x)$ $p(x) \to P(X=x)$ $p(0)$ $P(X=0)$

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integration of pdf till given point is cdf

Agastya Ramani Krishna K...
P(X=x) = area of the graph

UME HARISA JOINED

Smita Ranjan
yes

S Bhagath
in interest

Seelam Resh...
its upto x

Vivek Singh
add all prob till that point

K GIRISH GOPINATHAN JOINED

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WEBINAR 2

Cumulative- till

$f(x)$ $\quad$ $p(x) \to P(X=x)$ $\quad$ $p(0)$ $P(X=0)$

3. An insurance company offers its policyholders a number of different premium pay options. For a randomly selected policyholder, let of months between successive payments. The cdf of X is as follows

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PMF - discrete

pdf

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Vivek Singh
add all prob till that point

K GIRISH GOPINATHAN JOINED

S Bhagath
pmf for discrete

Gunasekaran R
PDF for Conti

Rabindra Harlalka
M for didcrete

Smita Ranjan
discrete

Arijit Barat
pmf - discreste

Vivek Singh
pmf discrete cdf continous

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cumulative- till

$f(x)$ $p(x) \to P(X=x)$ $p(0)$ $P(X=0)$

3. An insurance company offers its policyholders a number of different premium pay options. For a randomly selected policyholder, let of months between successive payments. The cdf of X is as follows

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$X = 1, 3, 4, 6, 12$

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PMF - discrete
PdF - Continuous

WEBINAR 2

Cumulative - till

$f(x)$ $p(x) \to P(X=x)$ $p(0) \to P(X=0)$

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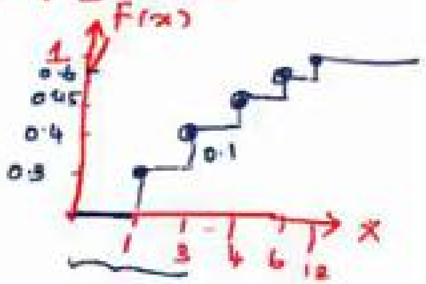
$X = 1, 3, 4, 6, 12$



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PMF - discrete
PdF - Continuous

WEBINAR 2

cumulative- till

f(x)   p(x) ↳ P(X=x)   p(0) P(X=a)

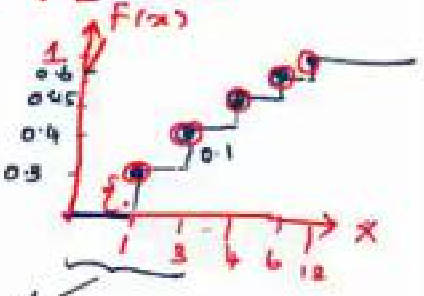
3. An insurance company offers its policyholders a number of different premium pay options. For a randomly selected policyholder, let of months between successive payments. The cdf of X is as follows

$F(x) = P[X \le x]$

non-decreasing

$$F(x) = \begin{cases} 0 & x < 1 \\ .30 & 1 \le x < 3 \\ .40 & 3 \le x < 4 \\ .45 & 4 \le x < 6 \\ .60 & 6 \le x < 12 \\ 1 & 12 \le x \end{cases}$$

X = 1, 3, 4, 6, 12



f(x) = { x=1

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PMF – discrete
PdF – Continuous

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Prakash Kumar: pmf discrete and PDF in Contin
Suraj Kumar: f(x)-f(x-1)
PARTHASARATHY K JOINED
S Bhagath: 1,3,4,6,12
AAKANSHA JAIN JOINED
SAI KUMAR K C JOINED
RAKESH T JOINED
DASADIYA VISHVDEEP MANISHBHAI JOINED
SWAPNA K JOSEPH JOINED
RAJASEKAR D JOINED
0.3
Sending to everyone
Write Message

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cumulative- till

$f(x)$ $p(x)$ $\to P(X=x)$ $p(a)$ $P(X=a)$

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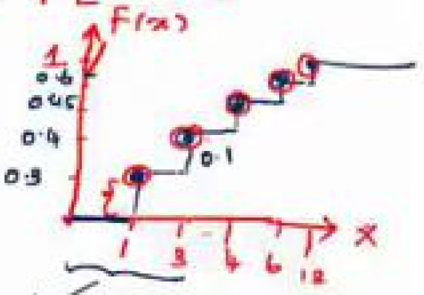

a. What is the PMF of X?

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$$f(x) = \begin{cases} 0.3 & x=1 \\ & x=3 \end{cases}$$

PMF – discrete

pdf – continuous

WEBINAR 2

cumulative- till

$f(x)$ $\quad p(x) \to P(X=x)$ $\quad p(0) \to P(X=0)$

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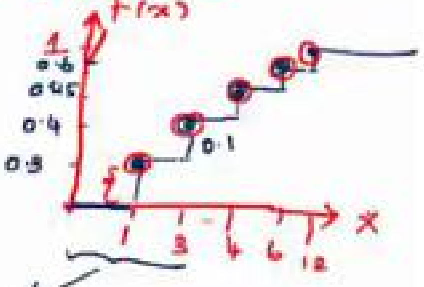

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$$f(x) = \begin{cases} 0.3 & x=1 \\ ? & x=3 \end{cases}$$

PMF - discrete
pdf - continuous

x = 2, 0.1 cumulative - till

f(x) p(x) → P(X = x) p(0) P(X = 0)

3. An insurance company offers its policyholders a number of different premium pay options. For a randomly selected policyholder, let of months between successive payments. The cdf of X is as follows

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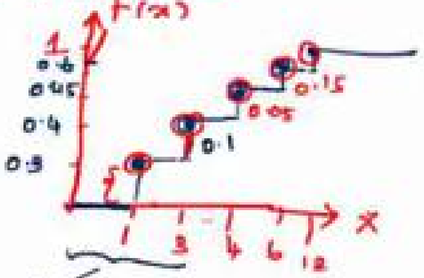

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PMF - discrete

pdf - continuous

b. $P[X = 3, 4, 6]$

$= 0.1 + 0.05 + 0.15$

$= 0.3$

a. $f(x) = \begin{cases} 0.3 & x = 1 \\ 0.1 & x = 3 \\ 0.05 & x = 4 \\ 0.15 & x = 6 \\ 0.4 & x = 12 \\ 0 & \text{otherw.} \end{cases}$

x 0 1 2 3

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Rabindra Harlalka: Why can we say that prob of X=2 is 0.. the CDF doesn't necessarily say that

RAGAVENDRAN U JOINED

Seelam Reshma Monica: is it not P(X<=6) - P(X<=3)

ok got it

Rabindra Harlalka: Not totally convinced

M R Vijay Krishnan: in our case if X=2 the probability will be 0 right

Rabindra Ha...: Ok

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WEBINAR 2

$x=2,\ 0.1$ Cumulative - till

$f(x)$ $p(x) \to P(X=x)$ $p(0)$ $P(X=0)$

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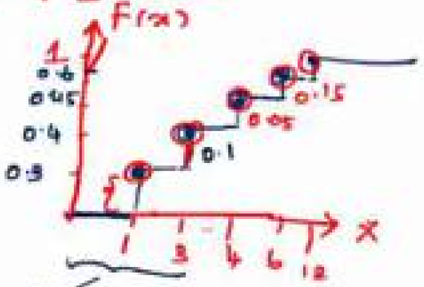

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x	0	1	2	3
$f(x)$	.			

PMF - discrete

pdf - continuous

b. $P[X = 3, 4, 6]$

$= 0.1 + 0.05 + 0.15$

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Chat Participants (96)

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BIJU M JOINED

Sending to everyone

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WEBINAR 2

$x = 2,\ 0.1$ Cumulative - till

$f(x)$ $p(x) \to P(X = x)$ $p(0) \to P(X = 0)$

3. An insurance company offers its policyholders a number of different premium pay options. For a randomly selected policyholder, let of months between successive payments. The cdf of X is as follows

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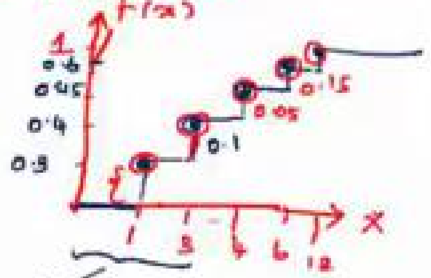

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PMF - discrete
pdf - Continuous

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$= 0.1 + 0.05 + 0.15$
$= 0.3$

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x	0	1	2	3
$f(x)$	0.1	0.4	0	0.5
$F(x)$	0.1	0.5	0.5	1

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Rabindra Harlalka
Why can we say that prob of X=2 is 0.. the CDF doesn't necessarily say that
RAGAVENDRAN U JOINED
Seelam Reshma Monica
is it not P(X<=6) - P(X<=3)
ok got it
Rabindra Harlalka
Not totally convinced
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Rabindra Ha...
Ok
BIJU M JOINED
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3. An insurance company offers its policyholders a number of different premium pay
options. For a randomly selected policyholder, let of months between successive payments. The cdf of X is as follows

$$F(x) = \begin{cases} 0 & x < 1 \\ .30 & 1 \le x < 3 \\ .40 & 3 \le x < 4 \\ .45 & 4 \le x < 6 \\ .60 & 6 \le x < 12 \\ 1 & 12 \le x \end{cases}$$

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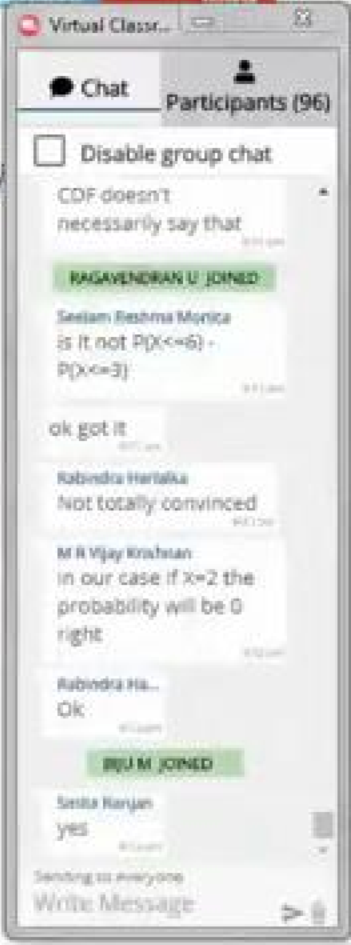

WEBINAR 2

$0 \le p(x) \le 1$

$E(x)$

cont. $0, 1, 2, 3, \ldots$

$X = \{1, 3, \ldots\}$

3. An insurance company offers its policyholders a number of different premium pay options. For a randomly selected policyholder. let of months between successive payments. The cdf of X is as follows

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a. What is the PMF of X?

b. Compute P(3≤ X ≤6)

c. Obtain E(x) and Variance of X.

x	1	3	4	6	12
$p(x)$	0.3	0.1	0.05	0.15	0.4
$x\,p(x)$	0.3	0.3	0.2	0.9	4.8
$x^2\,p(x)$	. . .				

$E(x) = \sum x\,p(x) = 6.5$

$Var(x) = E(x^2) - (E(x))^2 = 22.75$

WEBINAR 2

Note: Discrete $x = 0, 1, 2, 3.$ $\quad x < 2, \Rightarrow \boxed{0, 1}$

Continuous $0 < x < a.$ $\quad x < 2,\ x \leq 2$ $\quad \int_0^{2}$

4. Let X denote the temperature at which a certain chemical reaction takes place. Suppose that X has pdf $\longrightarrow$ continuous

$$f(x) = \begin{cases} \frac{1}{9}(4 - x^2) & -1 \leq x \leq 2 \\ 0 & \text{otherwise} \end{cases}$$

$$f(x) = \begin{cases} \frac{1}{9}(4 - x^2), & -1 \leq x \leq 2 \\ 0 & \text{otherwise.} \end{cases}$$

a. Compute $P(0 \leq X \leq 1)$

b. Obtain E(x) and Variance of X

Average

Mean

$E(x) \longrightarrow$ expected value x

$P(0 \leq x \leq 1)$

$= \int_0^1 \frac{1}{9} (4 - x^2)\, dx.$

$= \frac{1}{9} \left[4x - \frac{x^3}{3} \right]_0^1 = \frac{11}{27}$

$= \frac{1}{9} \Big[$

$=$

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pl specify the terms used mam

yes

like e^x

No

K Girish Gopinathan

What is meaning of E9x)

*E(x)

Okay..

Gunasekaran R

I thint like e^x on previosu slide, there may be some terms which we should know to solve this problem

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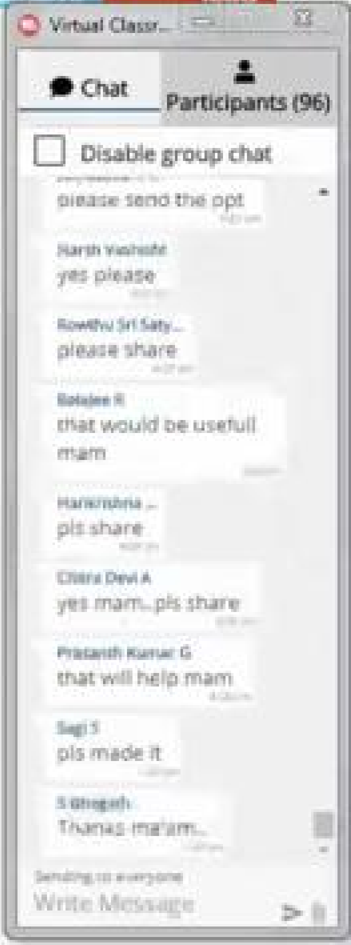
WEBINAR 2

5. A service station has both self-service and full-service islands. On each island, there is a single regular unleaded pump with two hoses. Let X denote the number of hoses being used on the self-service island at a particular time and let Y denote the number of hoses on the full-service island in use at that time. The joint probability mass function of X and Y is given below:

X	Y		
	0	1	2
0	0.10	0.04	0.02
1	0.08	0.20	0.06
2	0.06	0.14	0.30

a. Find the marginal probability mass function of X and Y
b. Give the verbal description the event ($X \neq 0$ and $Y \neq 0$) and compute the probability of this event.
c. Find $P(X=1|Y=2)$ and $P(Y=2|X=1)$



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X	Y		
	0	1	2
0	0.10	0.04	0.02
1	0.08	0.20	0.06
2	0.06	0.14	0.30

a. Find the marginal probability mass function of X and Y
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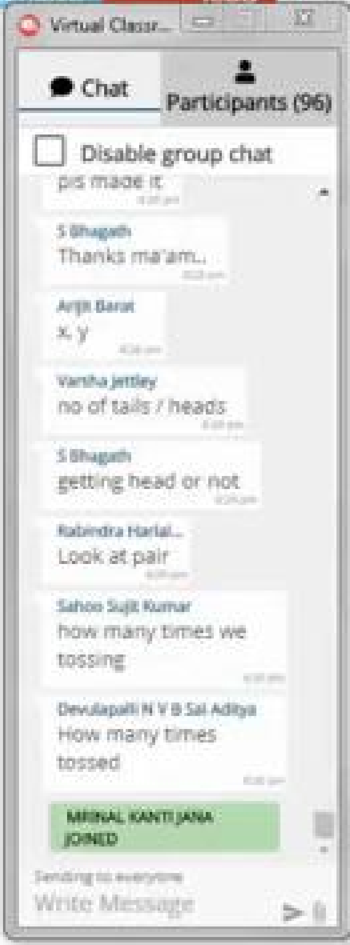

WEBINAR 2

Tossing coins

x : No. of heads/tails

y : No. of tosses

innovate achieve lead

5. A service station has both self-service and full-service islands. On each island, there is a single regular unleaded pump with two hoses. Let X denote the number of hoses being used on the self-service island at a particular time and let Y denote the number of hoses on the full-service island in use at that time. The joint probability mass function of X and Y is given below:

X	Y		
	0	1	2
0	0.10	0.04	0.02
1	0.08	0.20	0.06
2	0.06	0.14	0.30

a. Find the marginal probability mass function of X and Y

b. Give the verbal description the event ($X \neq 0$ and $Y \neq 0$) and compute the probability of this event.

c. Find $P(X=1|Y=2)$ and $P(Y=2|X=1)$

Virtual Classr...

Chat

Participants (95)

Disable group chat

.16, .34, .5 - x

Seelam Res...
0.16

S Bhagath
sum of rows

Seelam Res...
0.34

SLSNVVSS...
.24, .38, .38

S Bhagath
0.5

Seelam Res...
0.6

sorry 0.5

AJAY SINGH DHAMA JOINED

0.24, 0.38, 0.38

Sending to everyone

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WEBINAR 2

Marginal PMF

X \ Y	0	1	2	$f_X(x)$
0	0.10	0.04	0.02	0.16
1	0.08	0.20	0.06	0.34
2	0.06	0.14	0.30	0.5
$f_Y(y)$				

$$f_X(x) = \begin{cases} 0.16 & x = 0 \\ 0.34 & x = 1 \\ 0.5 & x = 2 \\ 0 & \text{other} \end{cases}$$

$$f_Y(y) = \begin{cases} 0.24 & y = 0 \\ 0.38 & y = 1 \\ 0.38 & y = 2 \\ 0 & \text{other} \end{cases}$$

a. Find the marginal probability mass function of X and Y

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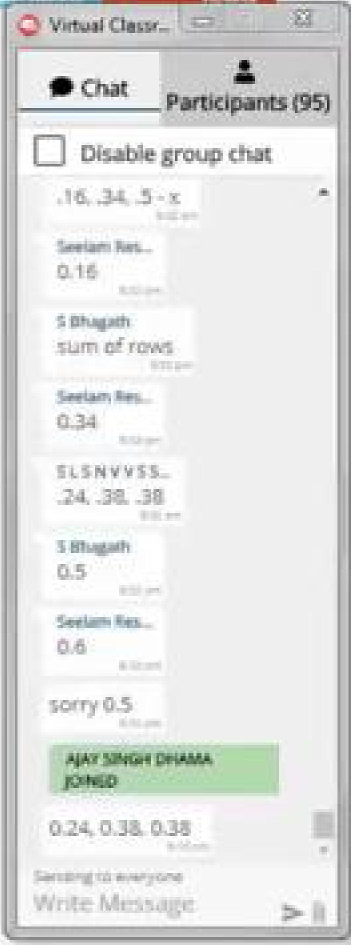

WEBINAR 2

$P(x \neq 0 \text{ and } y \neq 0)$
$= 1 - P(x=0 \text{ or } y=0)$

$\rightarrow P(A/B) = \frac{P(A \cap B)}{P(B)}$

Marginal PMF

X	Y			$f_X(x)$
	0	1	2	
0	0.10	0.04	0.02	0.16
1	0.08	0.20	0.06	0.34
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$x=1,2$ $\quad y=1,2$ $\quad$ atleast

$1 - P(x=0, y=0)$

$1 - 0.1 = 0.9$

$P(x=1/y=2) = \frac{P(x=1 \text{ and } y=2)}{P(y=2)} = \frac{0.06}{0.38} = 0.157 \simeq 0.16$

$P(y=2/x=1) = \frac{P(x=1, y=2)}{P(x=1)} = \frac{0.06}{0.34} = 0.18$

different

WEBINAR 2

Exercise.

"Midsem."

Consider the following Joint distribution of two random variables X and

X \ Y	1	2	3	4	5
1	0	0	2k	4k	4k
2	4k	4k	8k	8k	8k
3	2k	2k	k	k	0
$f_Y(y)$	6k	6k	11k	13k	12k

$p(X \leq 2)$

a. For what value(s) of k it is a valid distribution : $64k = 1$

$$k = \frac{1}{64}$$

b. Find Marginal Distribution of X and Y

c. Find $P(X \leq 2)$

d. Find $P(X \leq 2 / Y = 2)$

e. Find $P(X \leq 3 / Y \leq 2)$

Virtual Classroom

Chat

Participants (93)

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ok

Thanks

M R Vijay Kri...
sure

Seelam Ras...
sure

S Bhagath
k = 1 / 64

Prakash Ku...
k=1/64

M R Vijay Krishnan
please share the ppt after the session please

S Bhagath
Ma'am.. with answer for all questions will be helpful..

Sending to everyone

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20:42
07-12-2021

WEBINAR 2

Exercise. "Midsem"

Consider the following Joint distribution of two random variables X and

X \ Y	1	2	3	4	5	6	$f_x(x)$
1	0	0	2k	4k	4k	6k	16K
2	4k	4k	8k	8k	8k	8k	40 k
3	2k	2k	k	k	0	2k	8 k
$f_y(y)$	6k	6k	11k	13k	12k	16k.	64k

$p(x \le 2)$

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d. Find $P(X \le 2/\ Y = 2)$

=

e. Find $P(X \le 3/\ Y \le 2)$

The joint probability mass function of the two random variables (X. Y) is given by

$$f(x,y) = \begin{cases} \frac{1}{5}(3x - y), 1 \le x \le 2, 1 \le y \le 3 \\ 0, otherwise \end{cases}$$

a. Find the P(X ≤ Y)

b. Find the marginal density functions of X and Y

c. Are X and Y independent?

d. Find E(XY)

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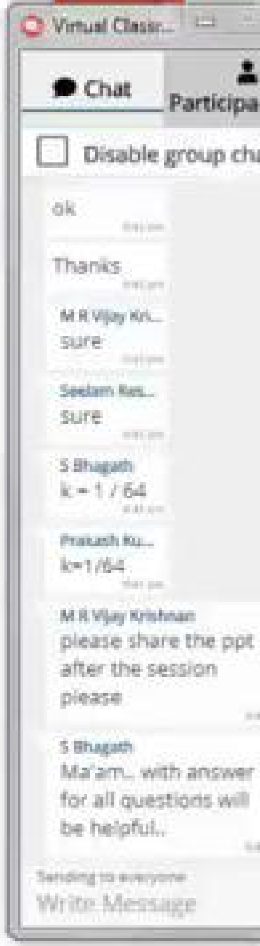

WEBINAR 2

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"Midsem."

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$$k = \frac{1}{64}$$

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=

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Virtual Classr...

Chat

Participa

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ok

Thanks

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sure

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Sending to everyone
Write Message

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WEBINAR 2

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Virtual Classr...

Chat

Participa

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S Bhagath
above

Arijit Barat
1<3

Neeraj Sabhnani
mam, why above portion

Geeta Rashant Bala Prasada
x <= y for above portion

Neeraj Sabh...
ok thanks

S Bhagath
x to 3

1 to 2

Arijit Barat
we can take horizonta
strip also right?

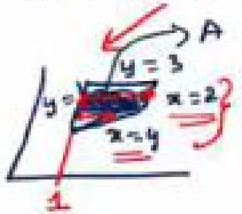
Sending to everyone
Write Message

The joint probability mass function of the two random variables (X, Y) is given by

midsem

$$f(x,y) = \begin{cases} \frac{1}{5}(3x - y), & 1 \le x \le 2, 1 \le y \le 3 \\ 0, & otherwise \end{cases}$$

a. Find the P(X ≤ Y)



b. Find the marginal density functions of X and Y

c. Are X and Y independent?

d. Find E(XY)

$$P(x \le y) = \iint_A \frac{1}{5}(3x - y)\, dx\, dy$$

$[\int \int]$

$$= \int \left\{ \int_1 \frac{1}{5}(3x - y)\, dx \right\} dy$$

$$= \int_1^2 \int_x^3 \frac{1}{5}(3x - y)\, dy\, dx$$

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S Bhagath
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WEBINAR 2

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b. Find the marginal density functions of X and Y

c. Are X and Y independent?

d. Find E(XY)

WEBINAR 2

It has been claimed that in 60% of all solar-heat installations the utility bill is reduced by at least one-third. Accordingly, what are the probabilities that the utility bill will be reduced by at least one-third in

a. four of five installations;
b. at least four of five installations
c. atmost four of five installations?

Solution (a) Substituting $x = 4$, $n = 5$, and $p = 0.60$ into the formula for the binomial distribution, we get

$$b(4;\,5,\,0.60) = \binom{5}{4}(0.60)^4(1-0.60)^{5-4} = 0.259$$

(b) Substituting $x = 5$, $n = 5$, and $p = 0.60$ into the formula for the binomial distribution, we get

$$b(5;\,5,\,0.60) = \binom{5}{5}(0.60)^5(1-0.60)^{5-5} = 0.078$$

and the answer is $b(4;\,5,\,0.60) + b(5;\,5,\,0.60) = 0.259 + 0.078 = 0.337$

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S Bhagath
x to 3
1 to 2
Arijit Barat
we can take horizont
strip also right?
like here you took
vertical.
ok
ISM-Tutorials JOINED
ok mam
Prakash Ku...
1 3
CHITRA DEVI A JOINED
S Bhagath
x*dx y *dy?
Sending to everyone
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WEBINAR 2

For health reasons, homes need to be inspected for radon gas which decays and produces alpha particles. One device counts the number of alpha particles that hit its detector. To a good approximation, in one area, the count for the next week follows a Poisson distribution with mean 1.3. Determine

a. the probability of exactly one particle next week.
b. the probability of one or more particles next week.
c. the probability of at least two but no more than four particles next week.

Solution Unlike the binomial case, there is no choice of a fixed Bernoulli trial here because one can always work with smaller intervals.

(a) $P(X = 1) = \dfrac{\lambda^1 e^{-\lambda}}{1!} = \dfrac{1.3e^{-1.3}}{1} = .3543$

Alternatively, using Table 2W, $F(1, 1.3) - F(0, 1.3) = 0.627 - 0.273 = 0.354$

(b) $P(X \geq 1) = 1 - P(X = 0) = 1 - e^{-1.3} = 0.727$

(c) $P(2 \leq X \leq 4) = F(4, 1.3) - F(1, 1.3) = 0.989 - 0.627 = 0.362$

WEBINAR 2

A computing system manager states that the rate of interruptions to the internet service is 0.2 per week. Use the Poisson distribution to find the probability of

a. one interription in 3 weeks
b. at least two interruptions in 5 weeks
c. at most one interruption in 15 weeks.

Solution Interruptions to the network occur randomly and the conditions for the Poisson distribution initially appear reasonable. We have $\lambda = 0.2$ for the expected number of interruptions in one week.

In terms of the cumulative probabilities,

(a) with $\lambda = (0.2) \cdot 3 = 0.6$, we get

$$F(1; 0.6) - F(0; 0.6) = 0.878 - 0.549$$
$$= 0.329$$

(b) With $\lambda = (0.2) \cdot 5 = 1.0$, we get

$$1 - F(1, 1.0) = 1 - 0.736$$
$$= 0.264$$

(c) With $\lambda = (0.2) \cdot 15 = 3.0$ we get

$$F(1, 3.0) = 0.199$$

WEBINAR 2

The Poisson Approximation to the Binomial Distribution:

11. It is known that 5% of the books bound at a certain bindery have defective bindings. Find the probability that 2 of 100 books bound by this bindery will have defective bindings using
    a. the formula for the binomial distribution:
    b. the Poisson approximation to the binomial distribution

Solution (a) Substituting $x = 2$, $n = 100$, and $p = 0.05$ into the formula for the binomial distribution, we get

$$b(2; 100, 0.05) = \binom{100}{2}(0.05)^2(0.95)^{98} = 0.081$$

(b) Substituting $x = 2$ and $\lambda = 100(0.05) = 5$ into the formula for the Poisson distribution, we get

$$f(2; 5) = \frac{5^2 \cdot e^{-5}}{2!} = 0.084$$

It is of interest to note that the difference between the two values we obtained (the error we would make by using the Poisson approximation) is only 0.003. [Had we used Table 2W instead of using a calculator to obtain e^{-5}, we would have obtained $f(2; 5) = F(2; 5) - F(1; 5) = 0.125 - 0.040 = 0.085$.]

WEBINAR 2

Let X, the grade of a randomly selected student in a test of a ISM course, be a norm
random variable. A professor is said to grade such a test on the curve if he finds the avera
μ and the standard deviation σ of the grades and then assigns letter grades according to t
following table.

Range of the grade	$X \geq \mu + \sigma$	$\mu \leq X < \mu + \sigma$	$\mu - \sigma \leq X < \mu$	$\mu - 2\sigma \leq X < \mu - \sigma$	$X < \mu - 2\sigma$
Letter grade	A	B	C	D	F

Suppose that the professor of the probability course grades the test on the curve. Determi
the percentage of the students who will get A, B, C, D, and F, respectively.

WEBINAR 2

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WEBINAR 2

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Range of the grade	$X \geq \mu + \sigma$	$\mu \leq X < \mu + \sigma$	$\mu - \sigma \leq X < \mu$	$\mu - 2\sigma \leq X < \mu$[...]
Letter grade	A	B	C	D

Suppose that the professor of the probability course grades the test o[...] [...]mine the percentage of the students who will get A, B, C, D, and F, respe[...]

Virtual Class

Chat

Participants (86)

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Good session mam. Thank you

Attention

The lecture is over. Recording will be available shortly.

OK

Thank you madam. Very good session!

Thanks Ma'am. Good learning

21:00
07-12-2021

WEBINAR 2

Let X, the grade of a randomly selected student in a test of a ISM course, be a normal random variable. A professor is said to grade such a test on the curve if he finds the average μ and the standard deviation σ of the grades and then assigns letter grades according to the following table.

Range of the grade	$X \geq \mu+\sigma$	$\mu \leq X < \mu+\sigma$	$\mu-\sigma \leq X < \mu$	$\mu-2\sigma \leq X < \mu-\sigma$	$X < \mu-2\sigma$
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