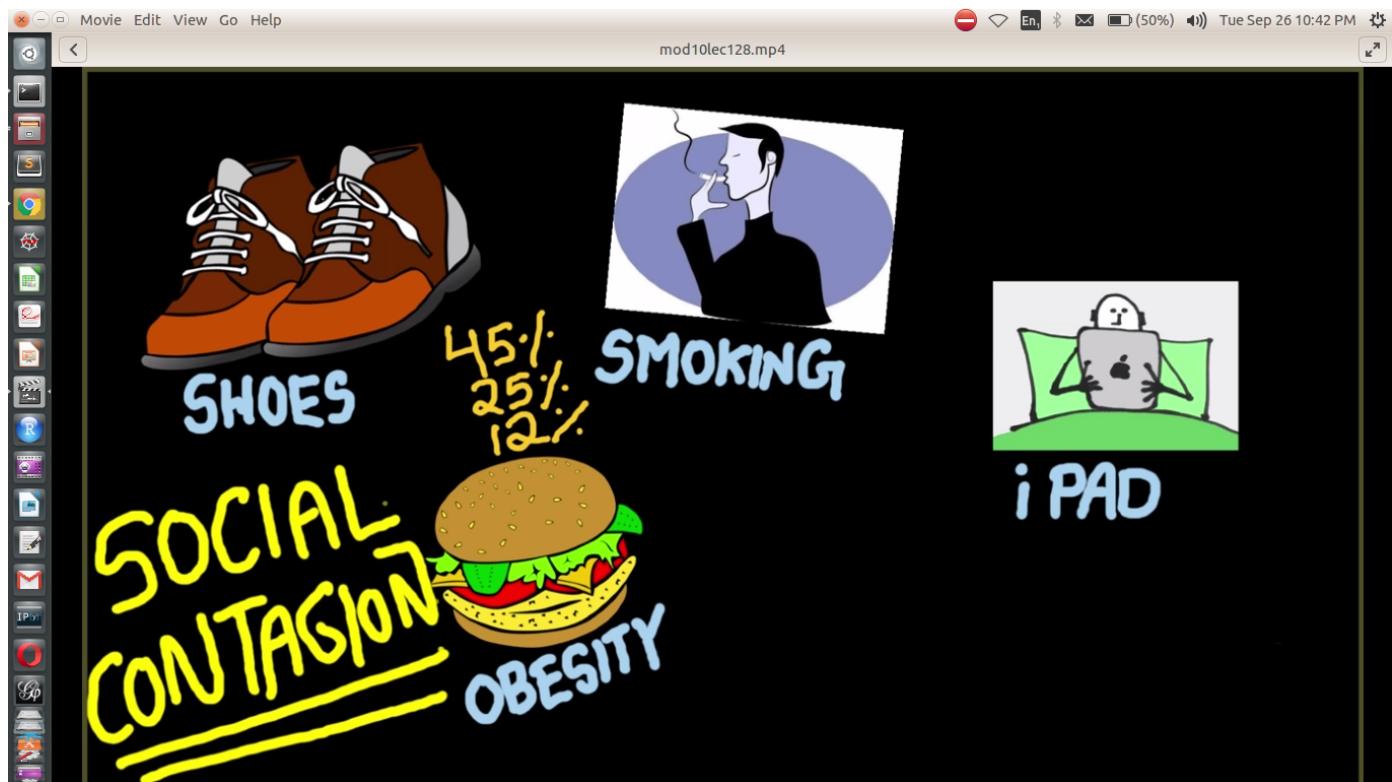
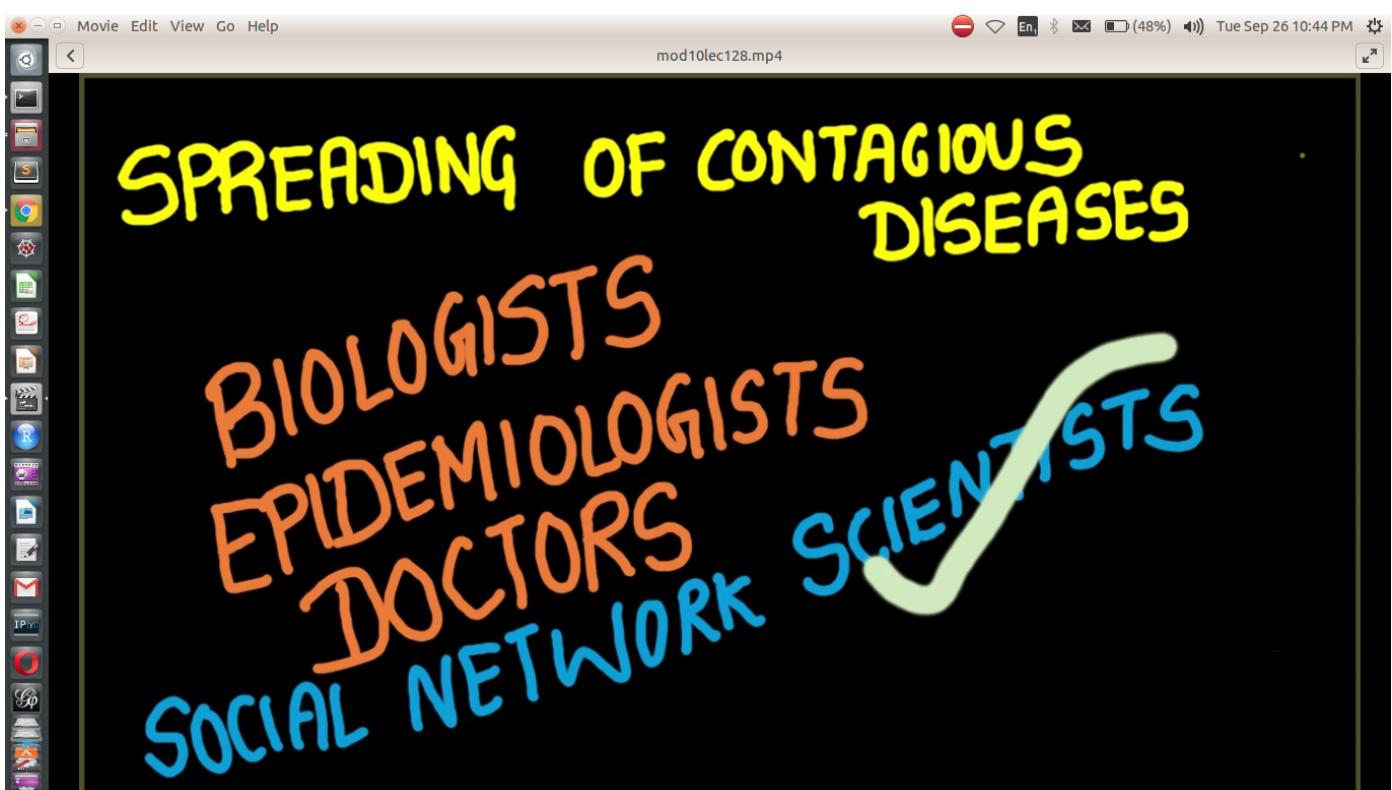
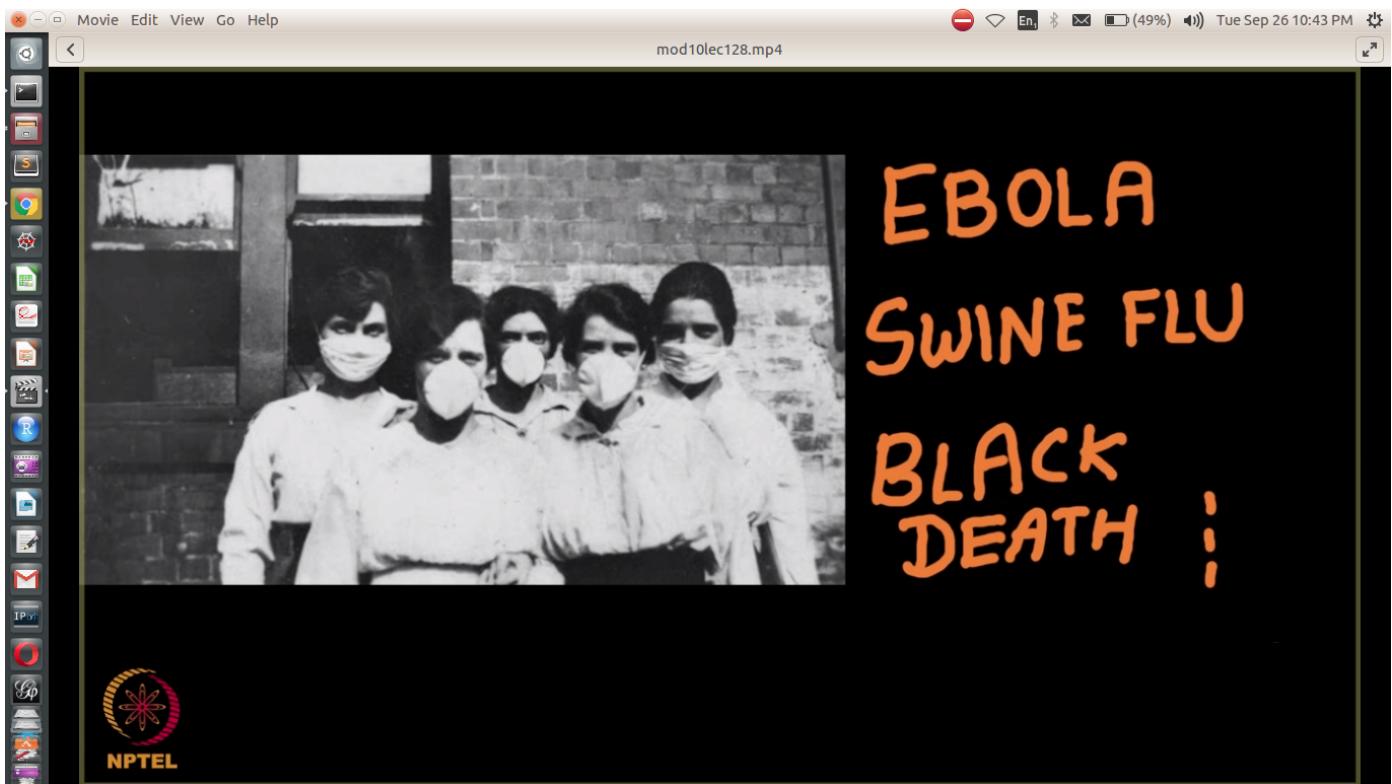
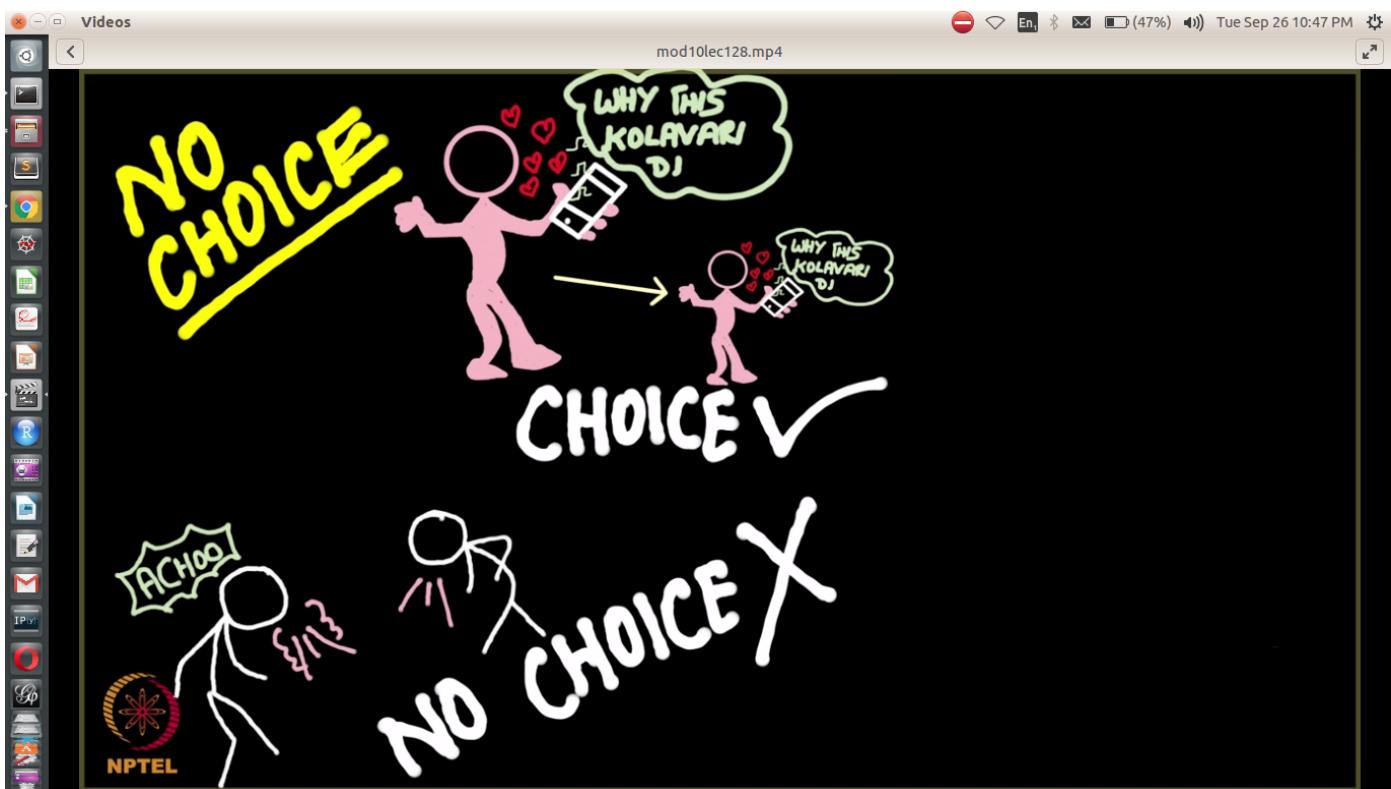
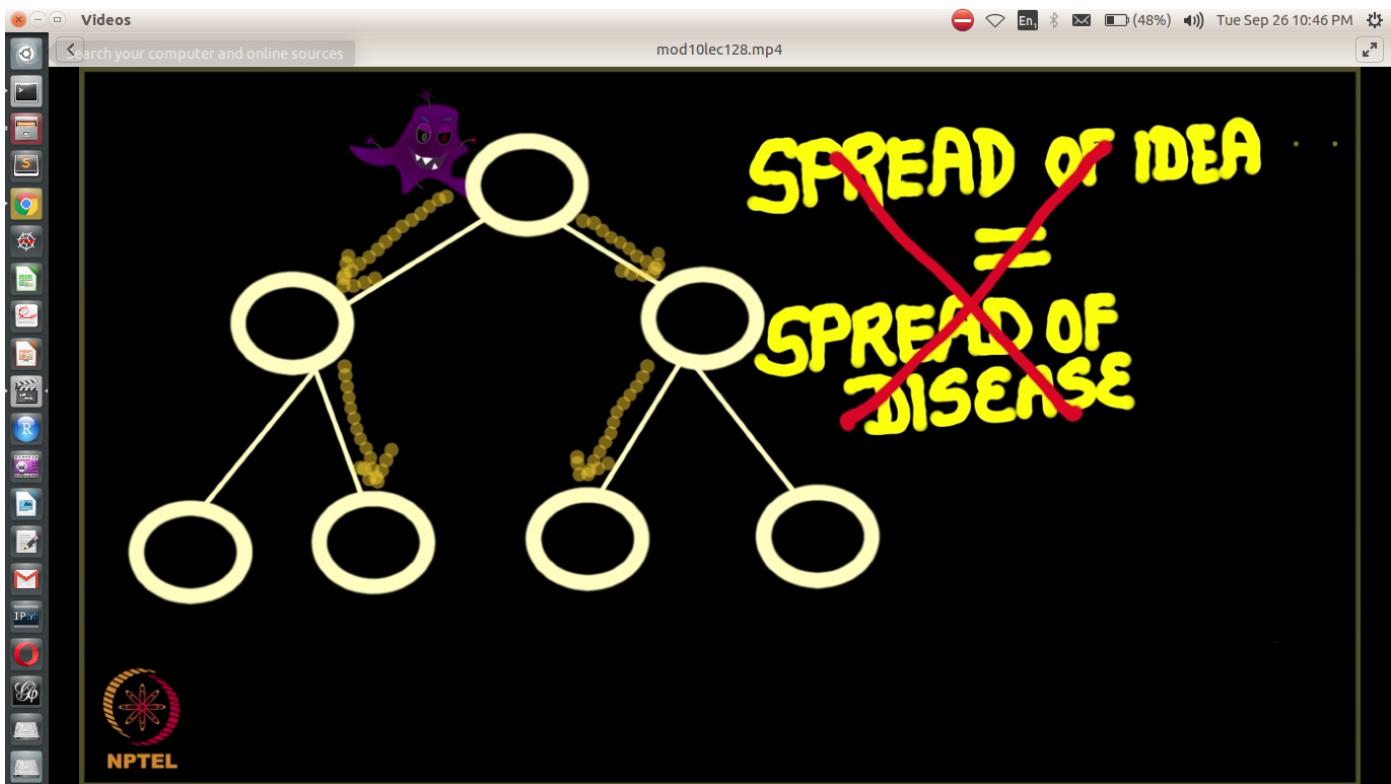
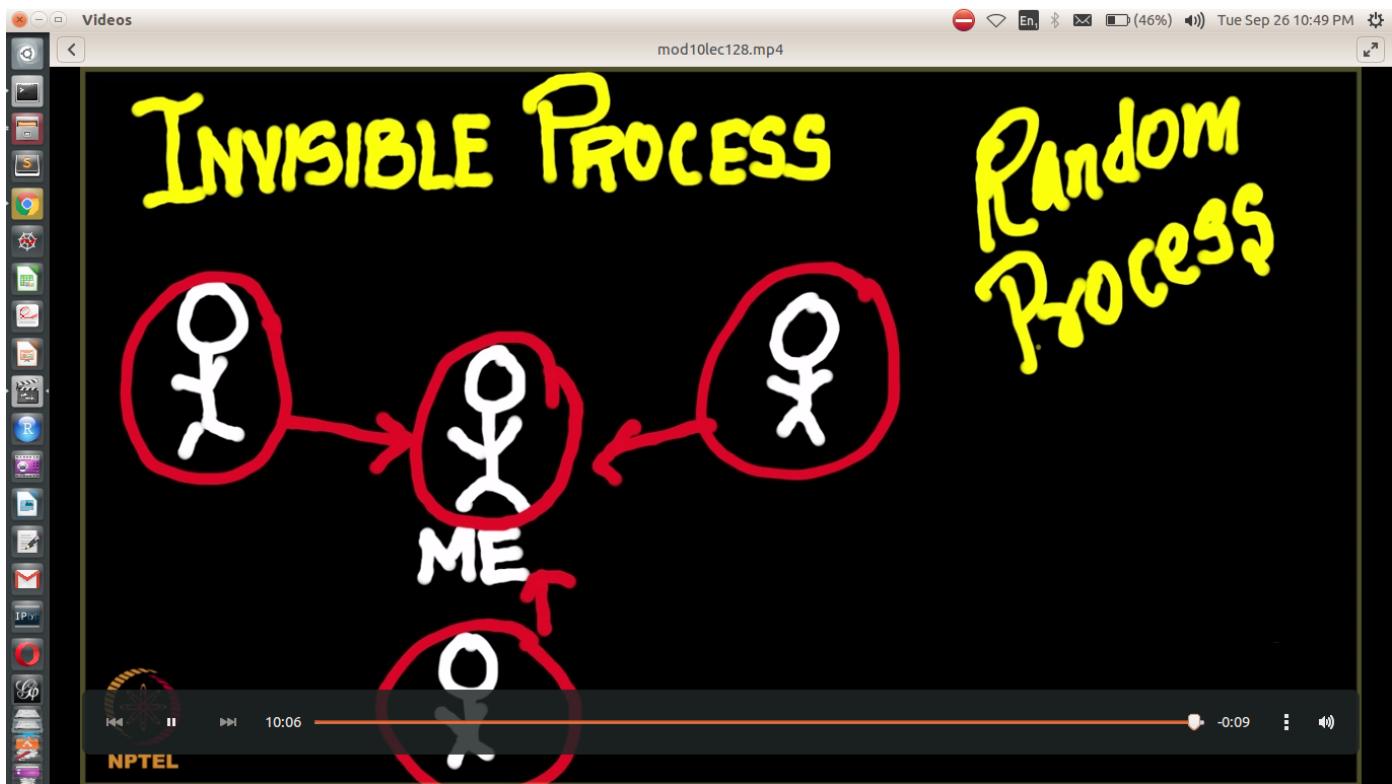


Lec 128 Rich get Richer Phenomena - 2 : Epidemics - An Introduction

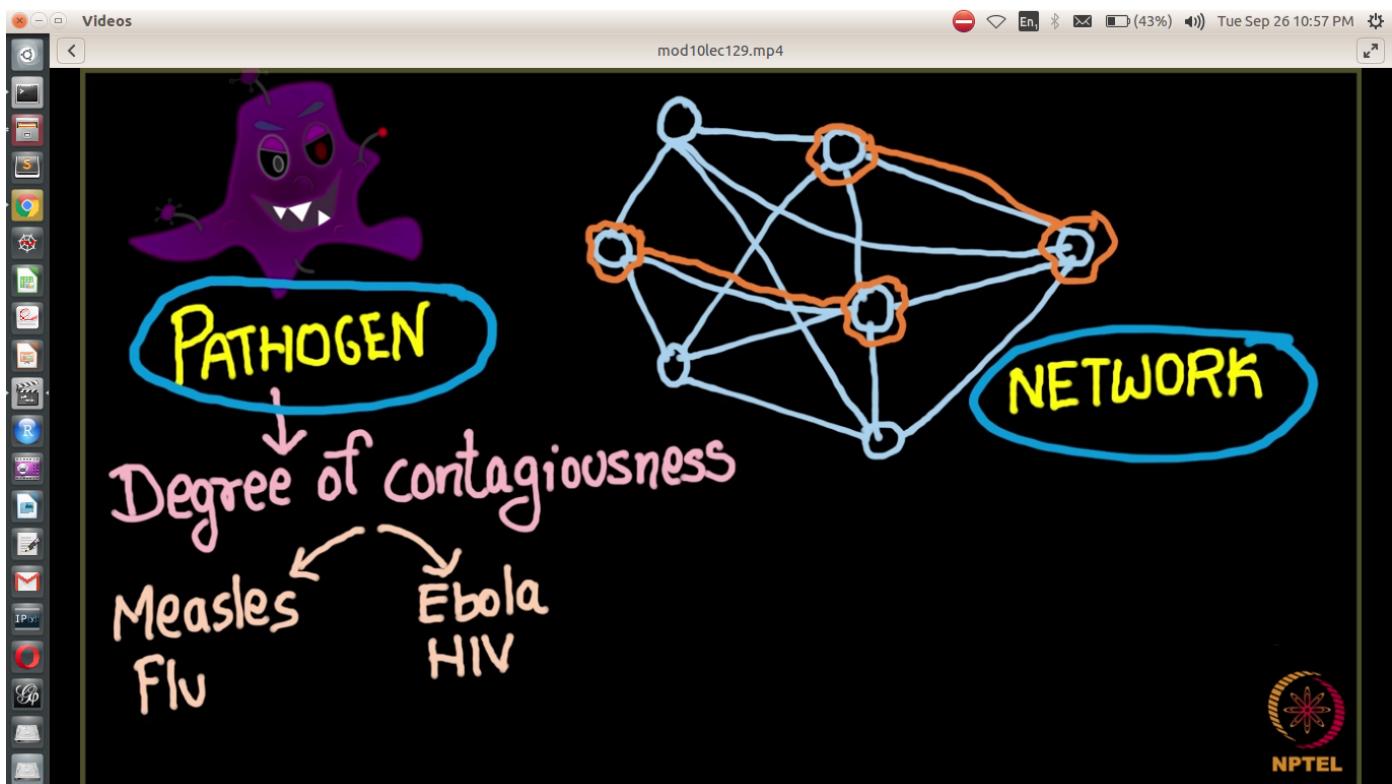




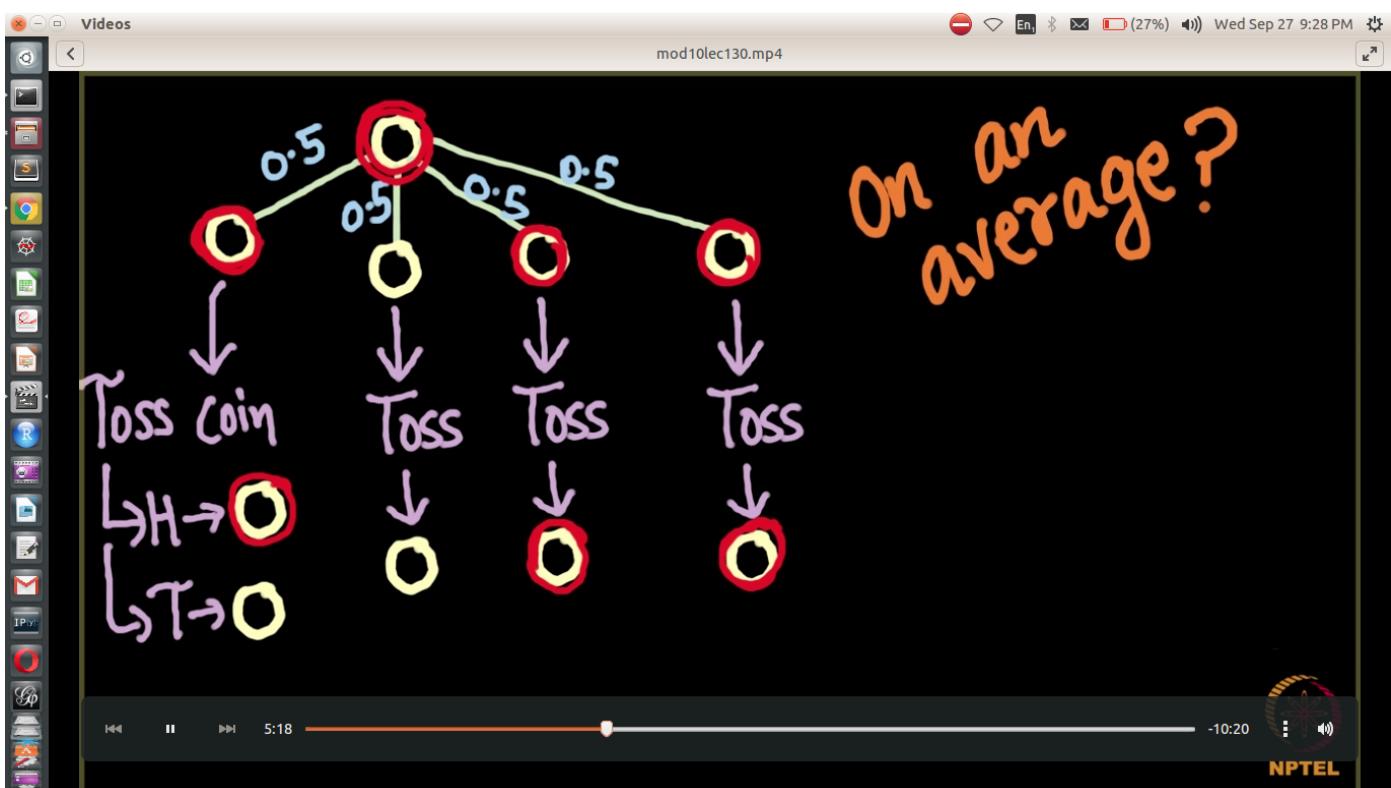
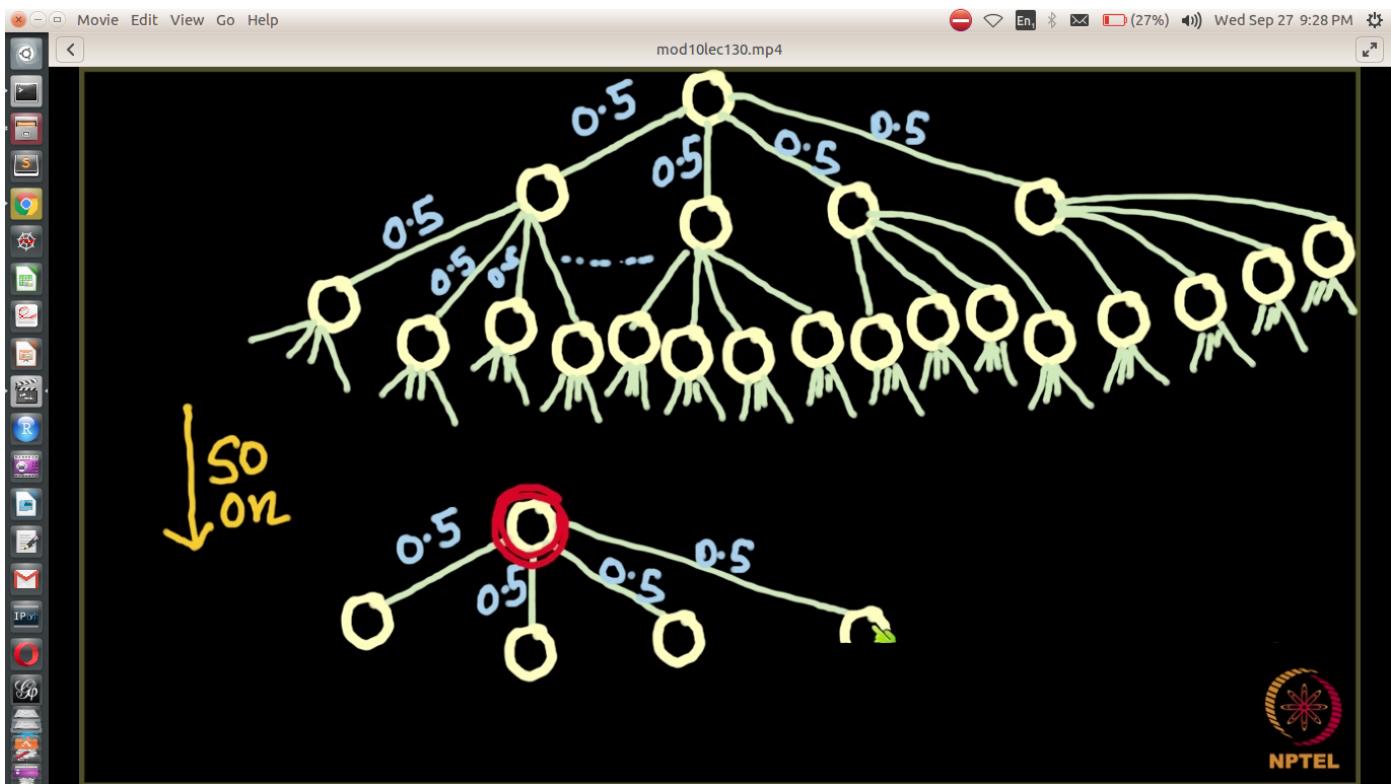




Lec 129 Rich get Richer Phenomena - 2 : (Continued)



Lec 130 Rich get Richer Phenomena - 2 : Simple Branching Process for modelling epidemics



Movie Edit View Go Help

mod10lec130.mp4

Number of heads

Random Variable $X = \text{number of heads}$

$$X = X_1 + X_2 + X_3 + X_4$$

$$E[X] = E[X_1] + E[X_2] + E[X_3] + E[X_4]$$

$$= P(X_1=1) + P(X_2=1) + P(X_3=1) + P(X_4=1)$$

$$= 0.5 + 0.5 + 0.5 + 0.5$$

$$= 2$$

Independent

$= 1, \text{ if head appears}$

$= 0, \text{ if else}$

NPTEL

Movie Edit View Go Help

mod10lec130.mp4

Expected number of heads =

$$E[X] = E[X_1] + \dots + E[X_4]$$

$$= 0.25 \times 4$$

$$= 1$$

Toss a biased coin

$P(\text{head}) = 0.25$

$P(\text{tail}) = 0.75$

NPTEL

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mod10lec130.mp4

Wednesday Sep 27 9:41 PM

Generalise

$P \rightarrow k \text{ neighbors}$

$E[X] = p + p \cdot \dots$ $k \text{ times}$

NPTEL

Lec 131 Rich get Richer Phenomena - 2 : Simple Branching Process for modelling epidemics (Continued)

Videos

mod10lec131.mp4

Wednesday Sep 27 9:46 PM

LOOKING AT MANY LEVELS

k each

$? \rightarrow k$

$? \rightarrow k+k+\dots+k = k^2$

$? \rightarrow k+k+k+\dots+k = k^3$

Level $i \rightarrow k^i$ people

NPTEL

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mod10lec131.mp4

Wednesday Sep 27 9:54 PM

LOOKING AT MANY LEVELS

$$p + p + \dots + p = pk \quad (\text{k times})$$

$$pk + pk + \dots + pk = (pk)^2 \quad (\text{pk times})$$

$$pk + pk + \dots + pk = (pk)^3 \quad ((pk)^2 \text{ times})$$

infected people

NPTEL

Videos

mod10lec131.mp4

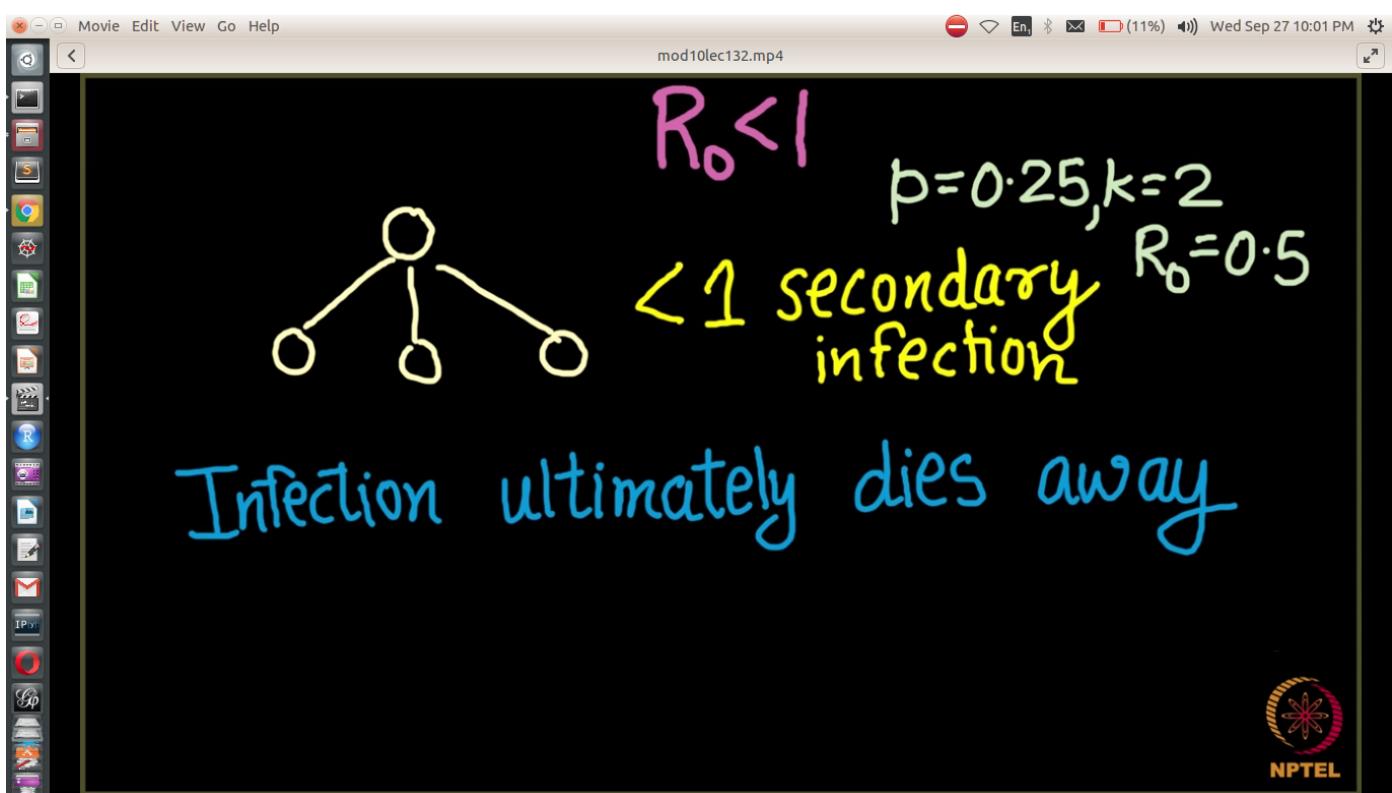
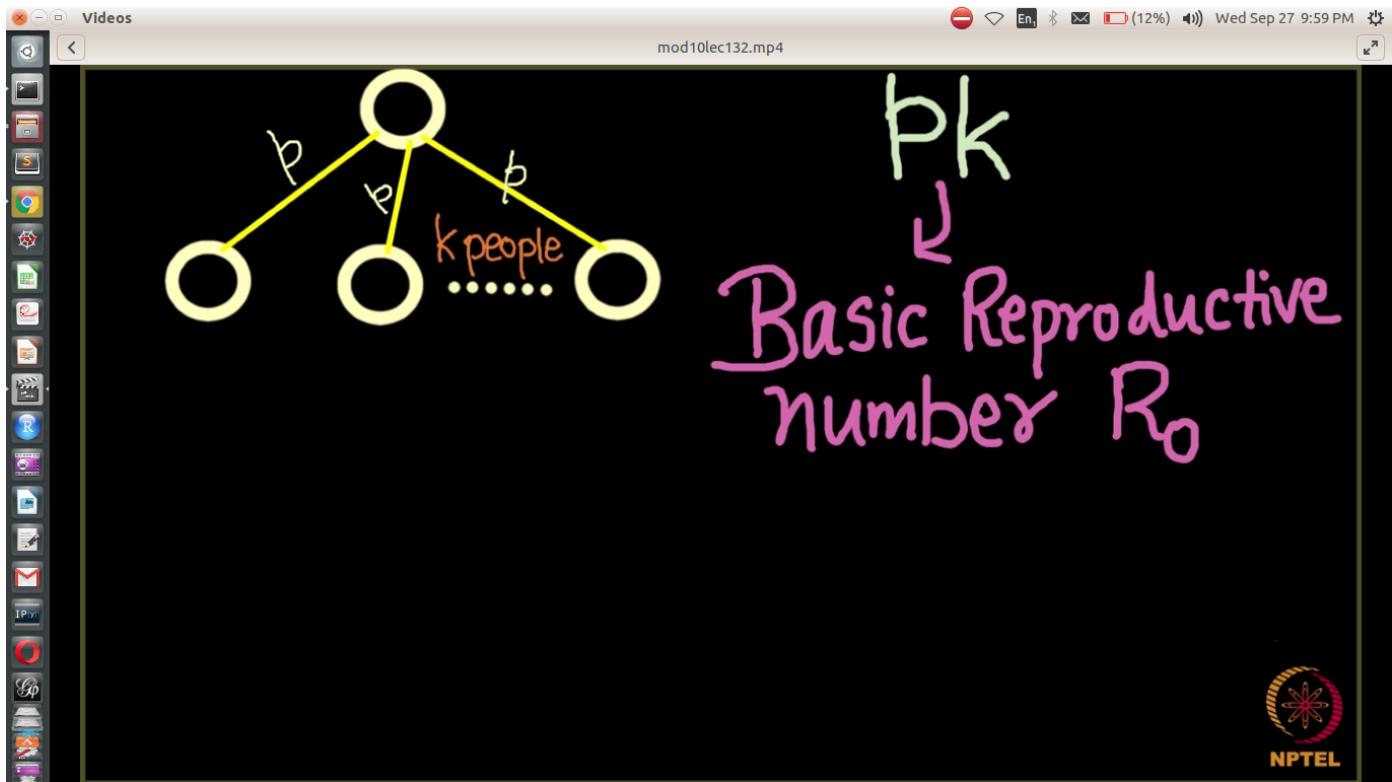
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LOOKING AT MANY LEVELS

EPIDEMIC?

NPTEL

Lec 132 Rich get Richer Phenomena - 2 : Basic Reproductive Number

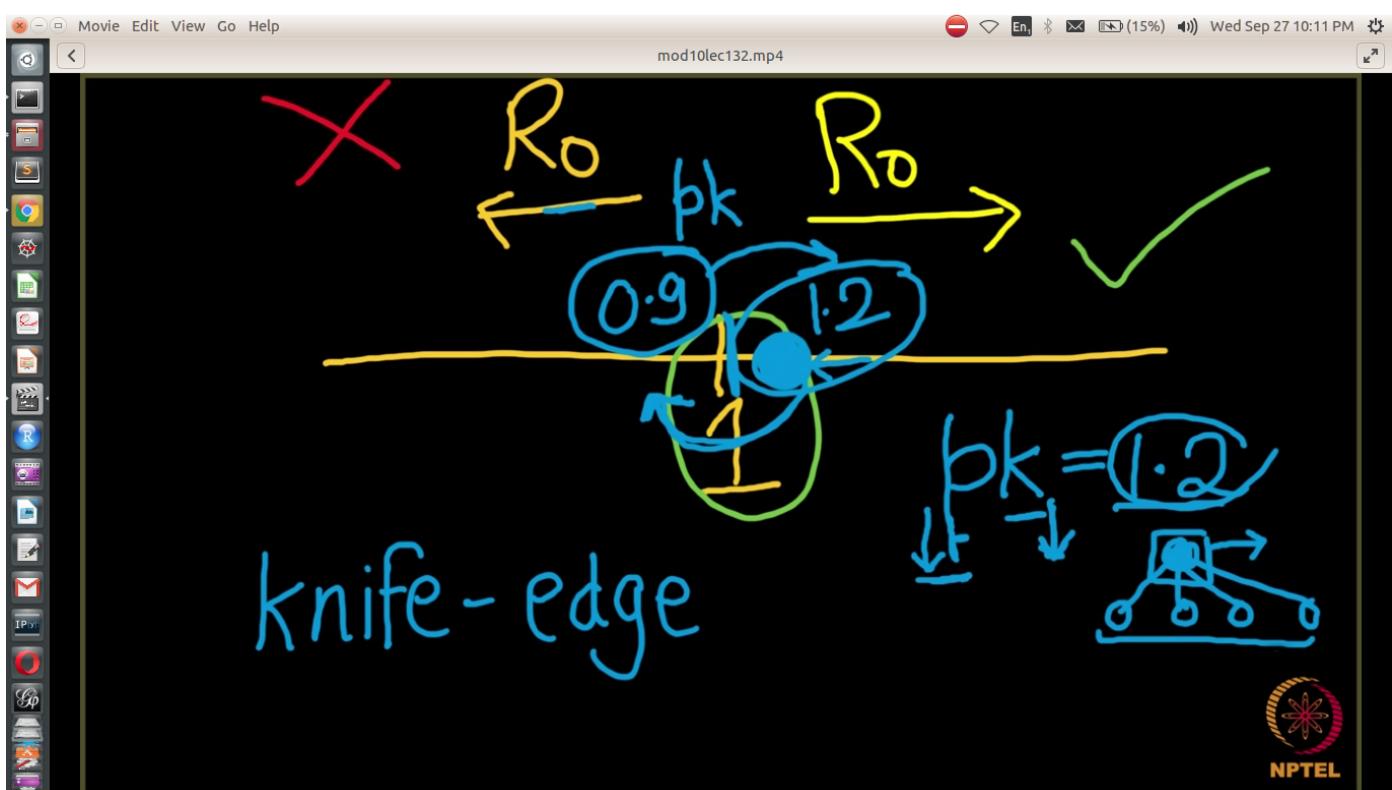


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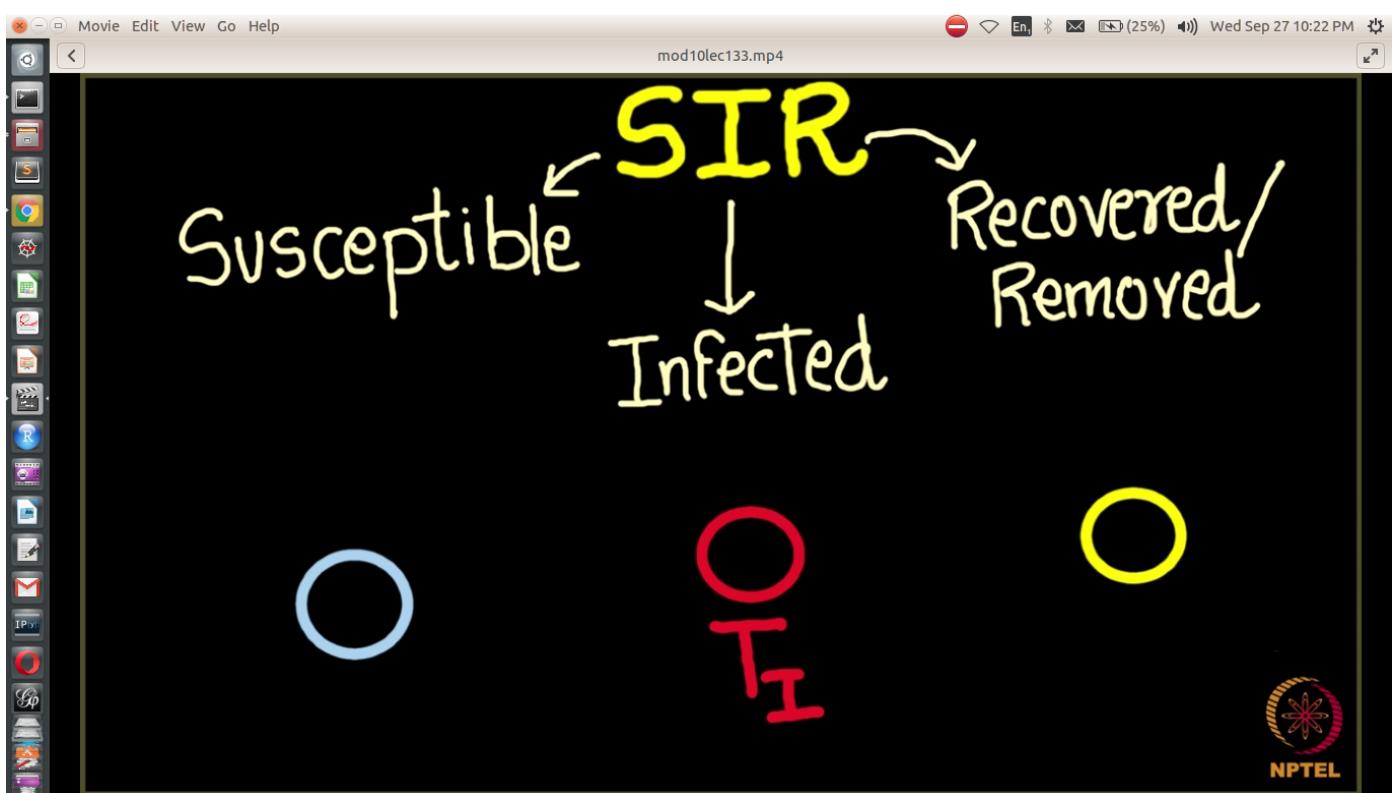
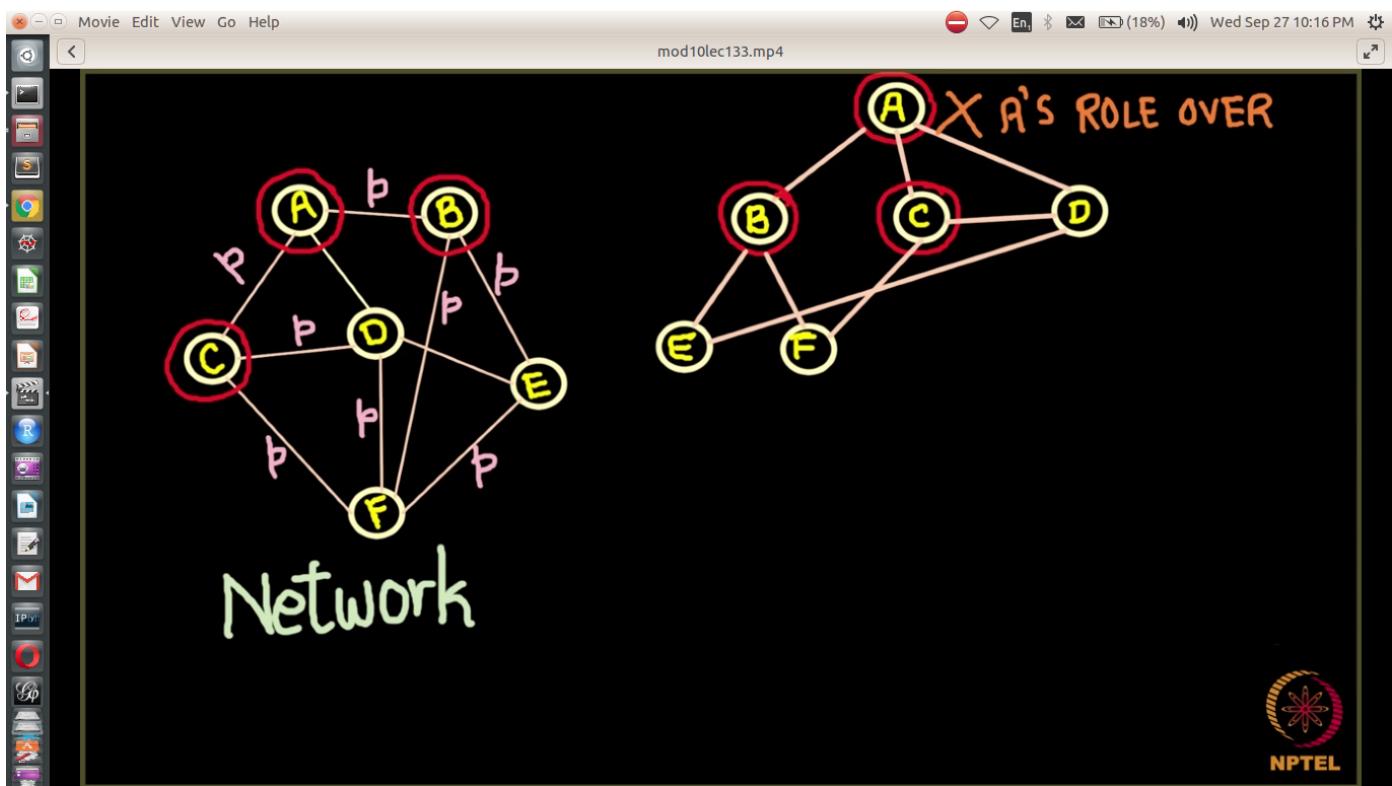
$R_0 < 1$: Dies away with
 $p\delta = 1$

$R_0 > 1$: Persists in n/w with +ve probability

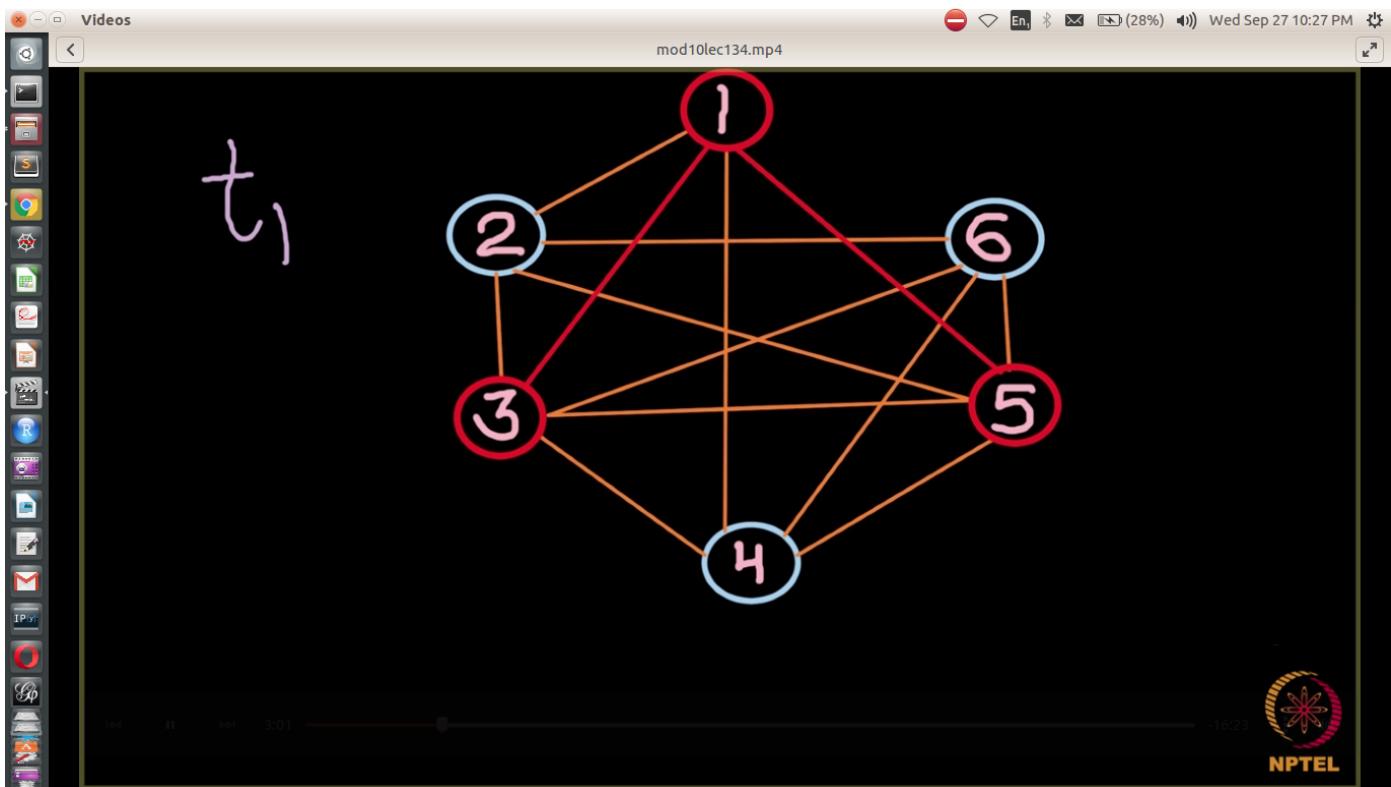
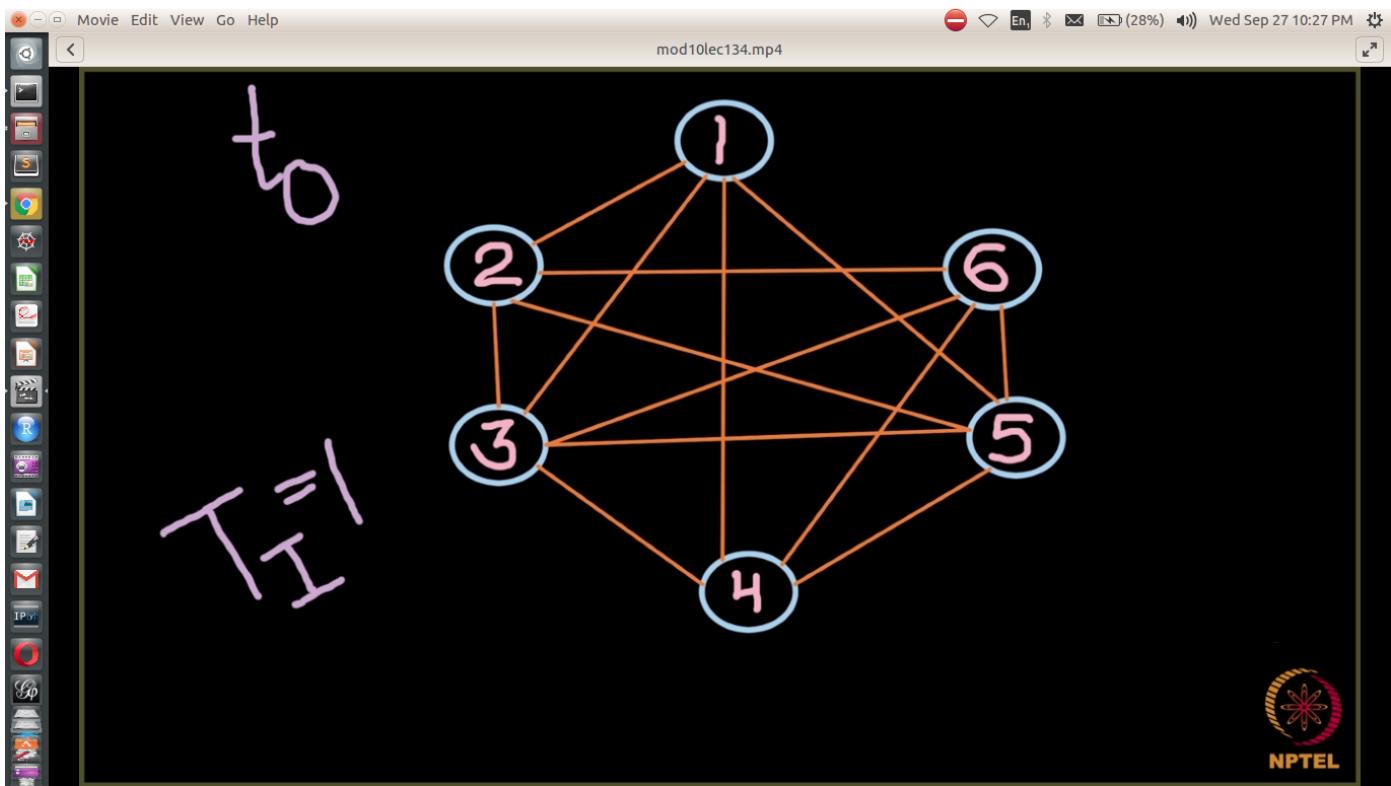
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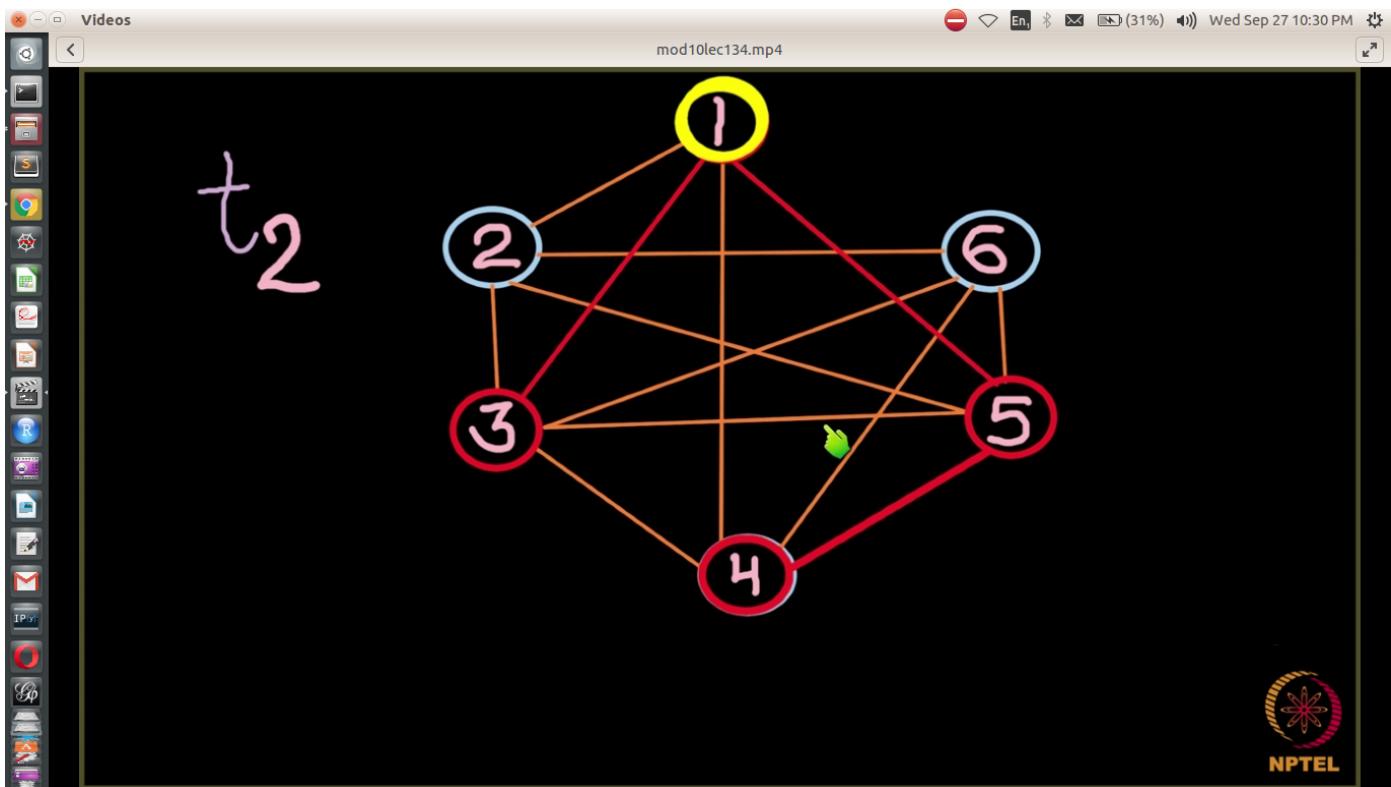
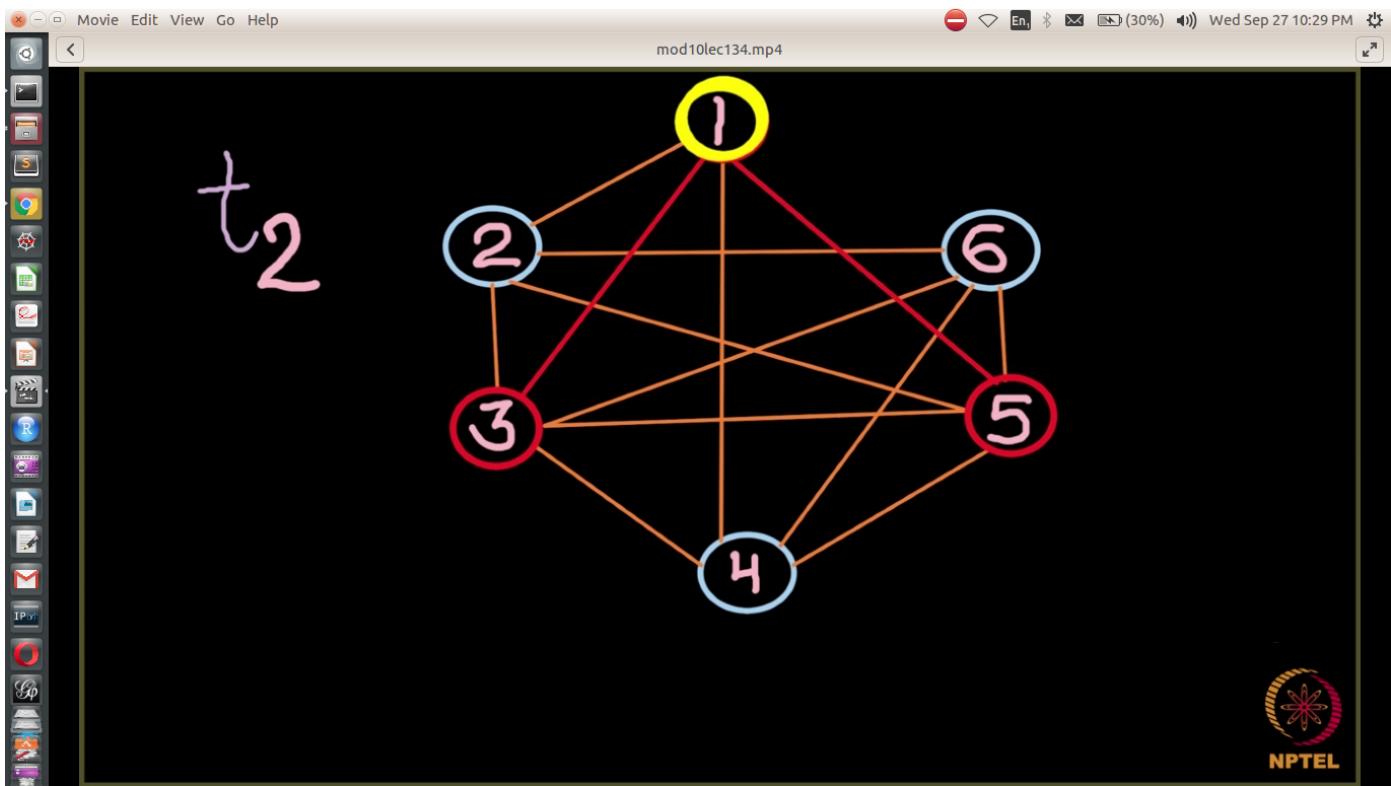


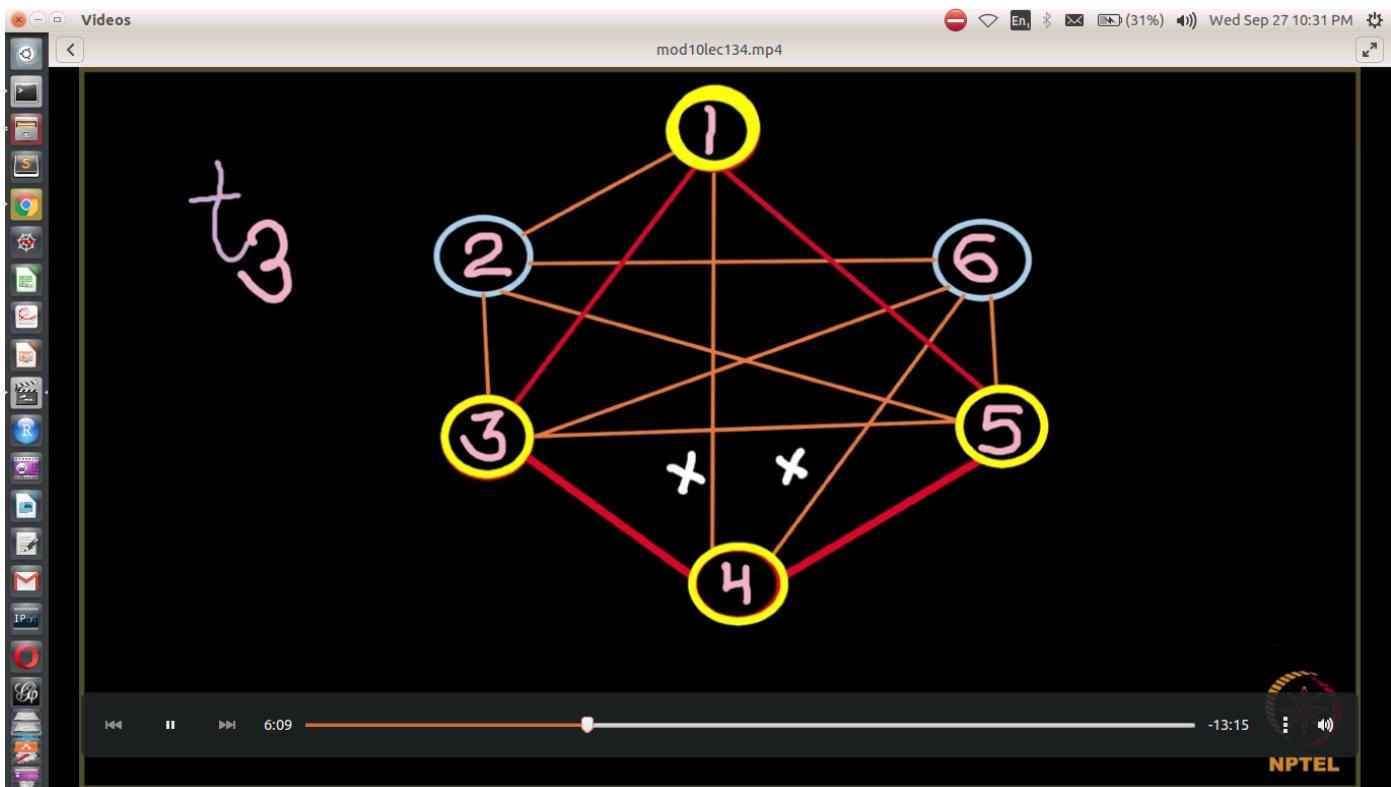
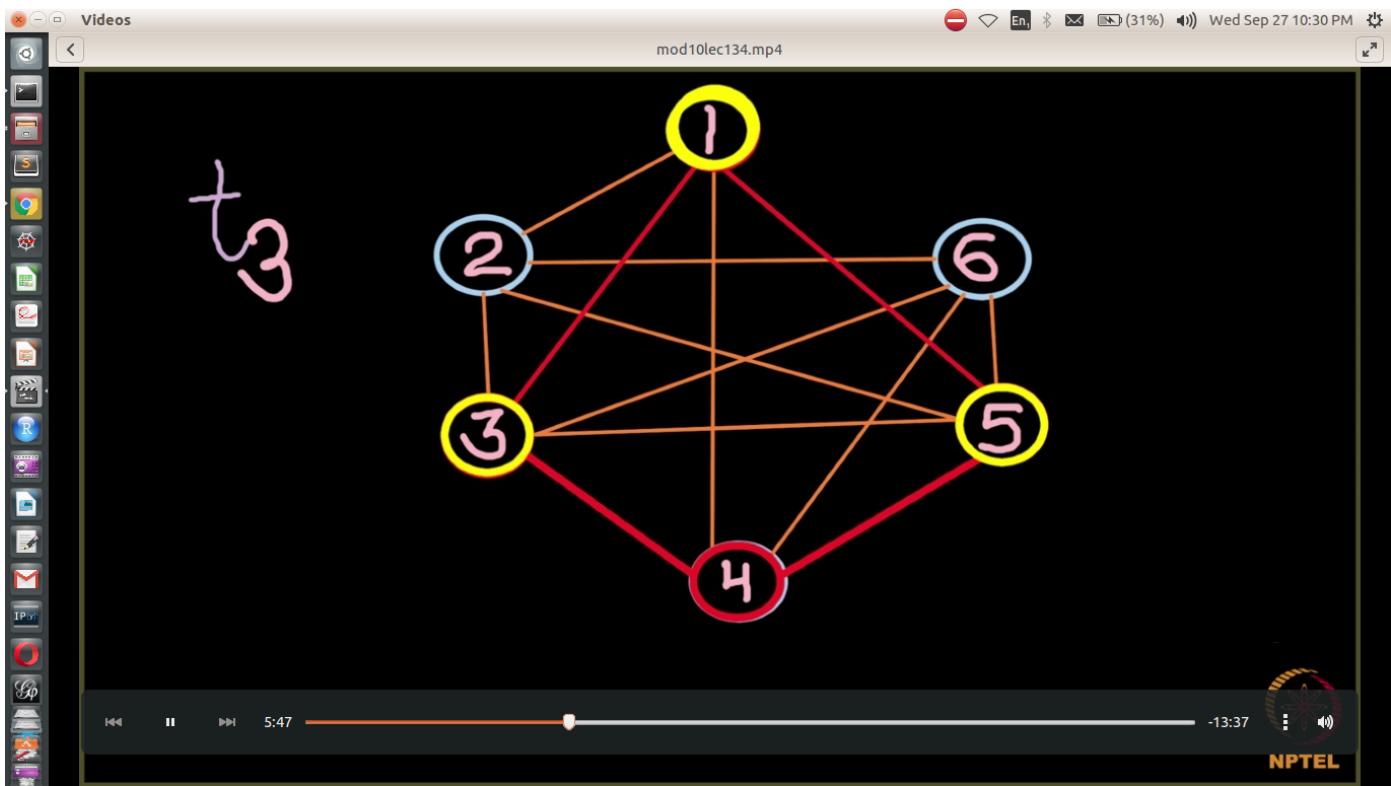
Lec 133 Rich get Richer Phenomena - 2 : Modelling Epidemics on Complex Networks

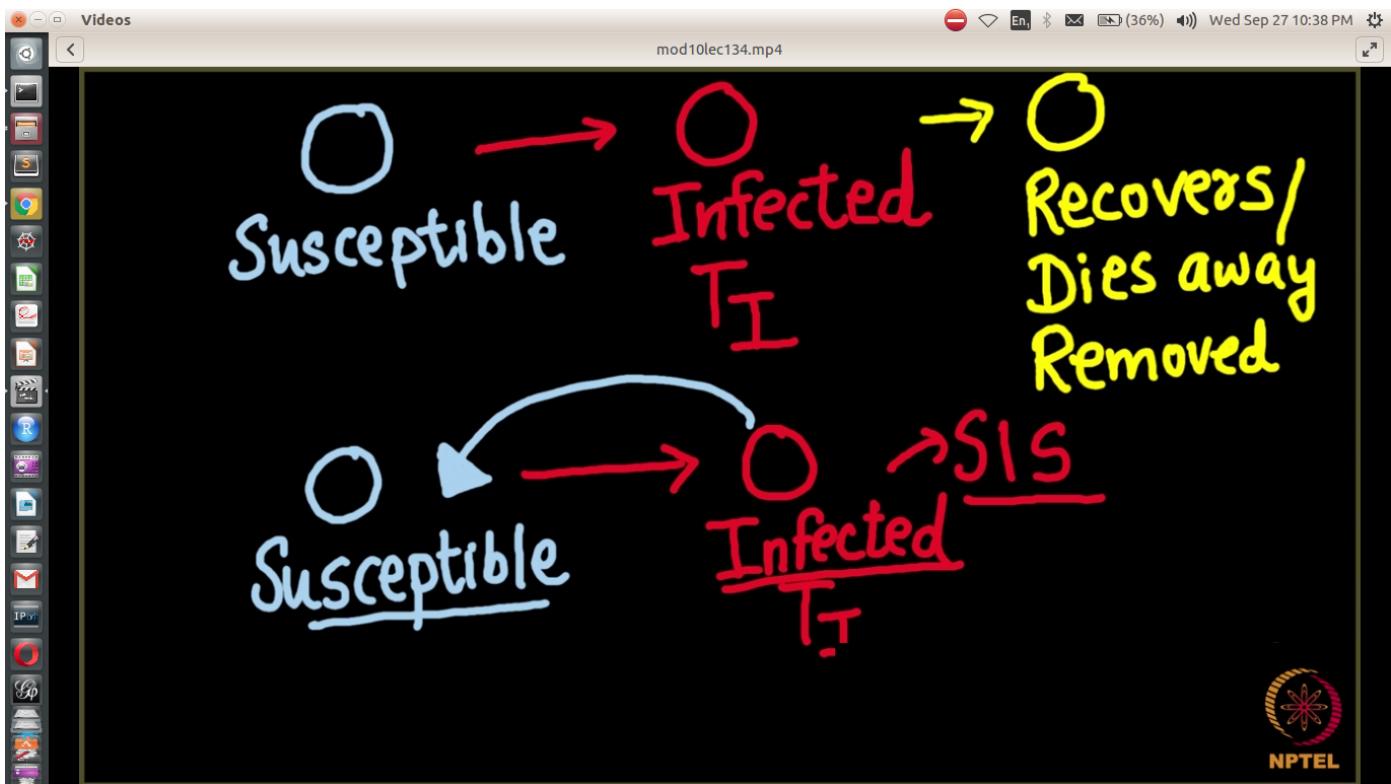


Lec 134 Rich get Richer Phenomena - 2 : SIR and SIS Spreading Models









SIS

