



# Connecting Neuroscience and Machine Learning

## Don't get Eaten by the Tiger

### Neuroscience of Decision Making

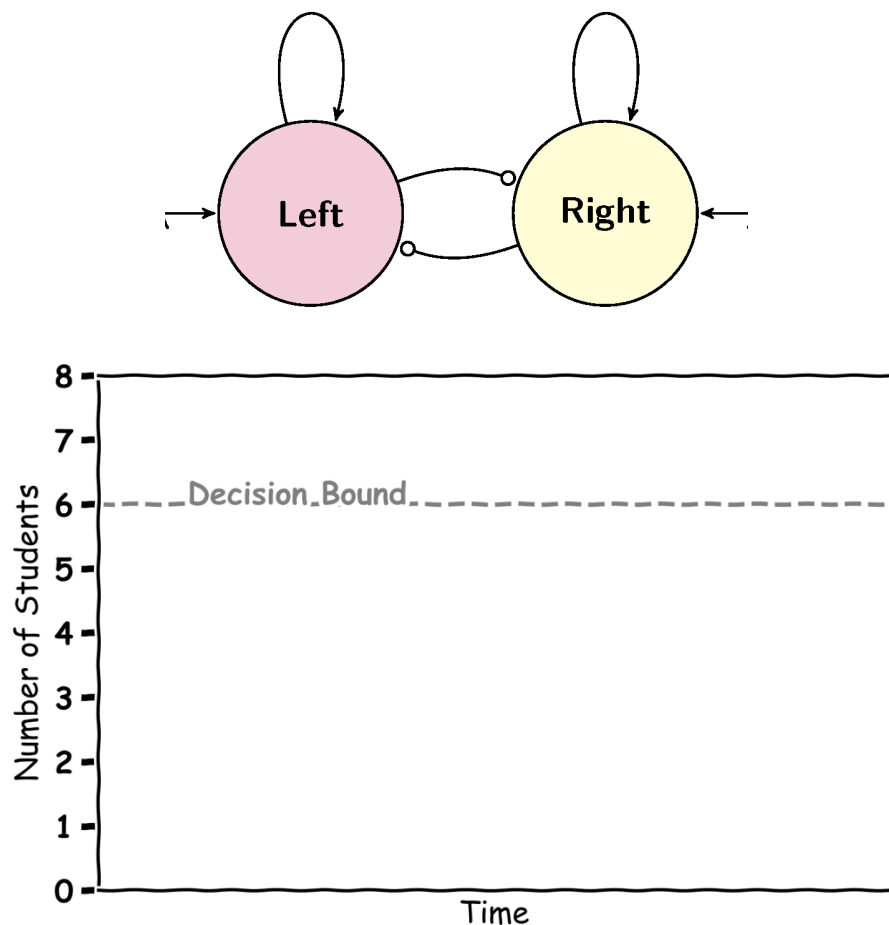
#### The Neuron

What is the basic **unit of information** for a neuron?

How do we **encode** it mathematically?

#### Two Populations of Neurons

Label the graph:



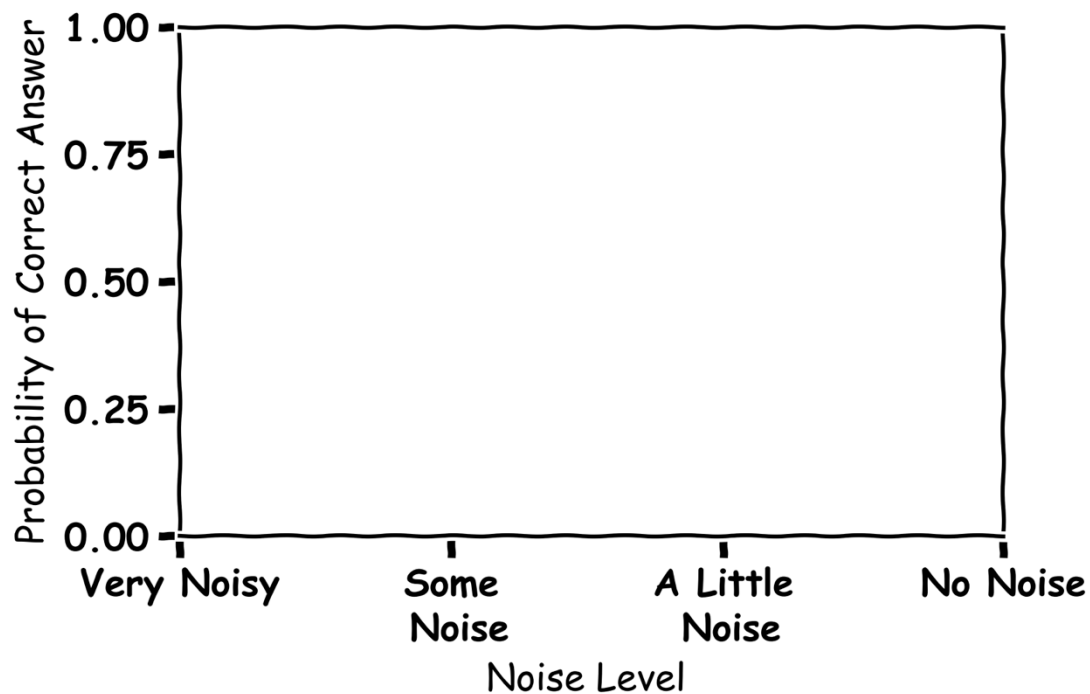


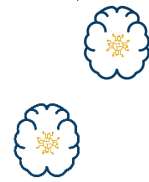
## Making Decisions

Label the graph:

Where is the **50-50 chance line**?

Fill in the graph with your answers:





# Machine Learning of Decision Making

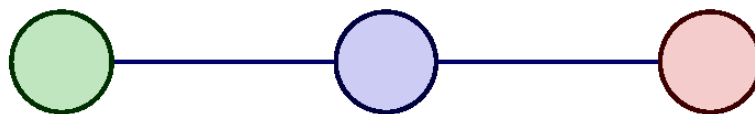
## The Algorithm

What is an **algorithm**? Give an **example**?

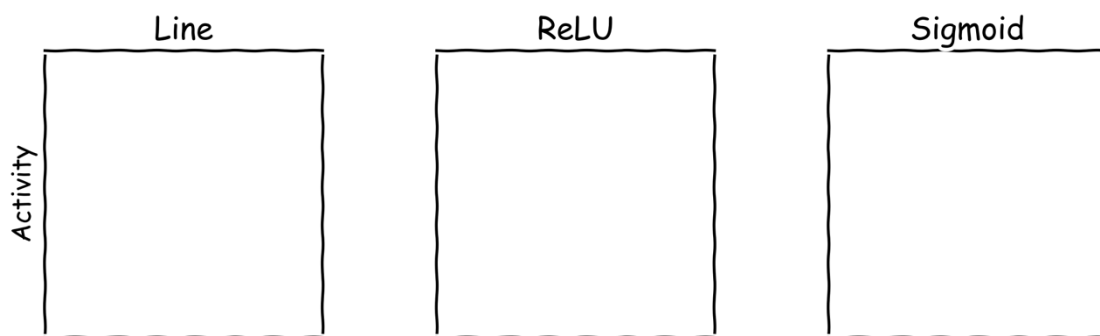
What is **Machine Learning**?

## The Node

**Label** the graph:



**Draw** the **functions** could be used in a node and what are they good for?

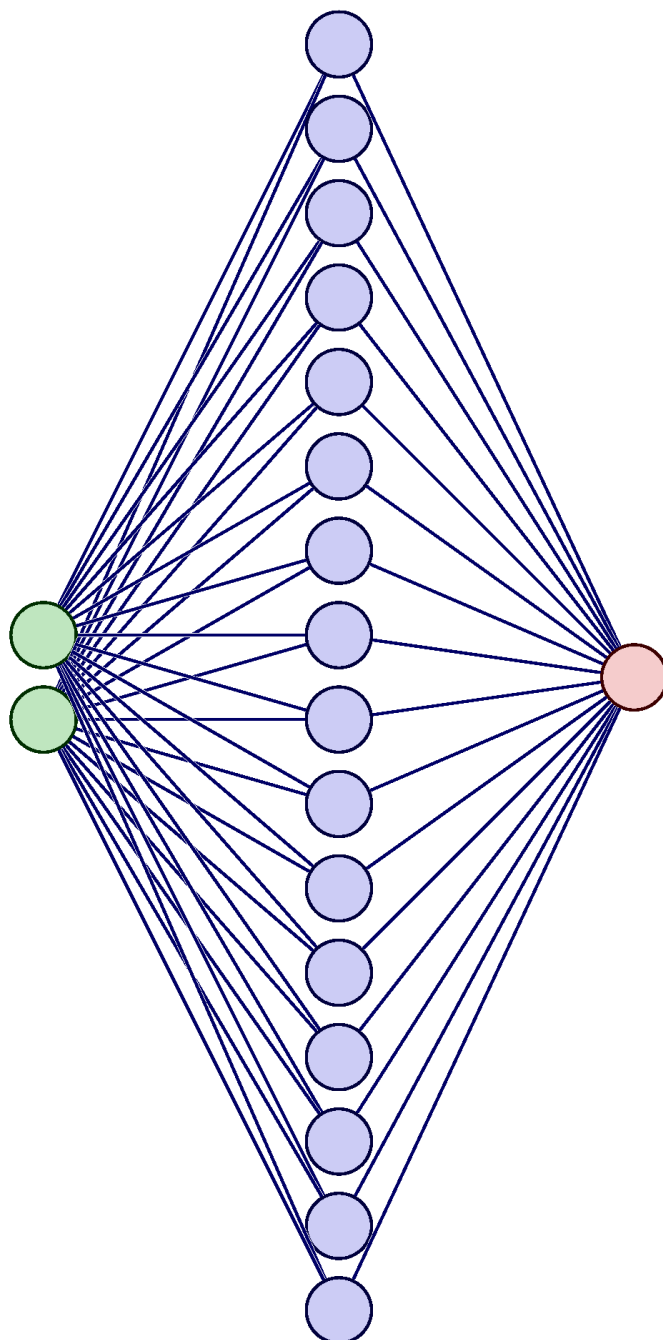


What does an **Artificial Neural Network** learn?



## An Artificial Neural Network

**Label** the graph:



How are you **smarter than AI**?



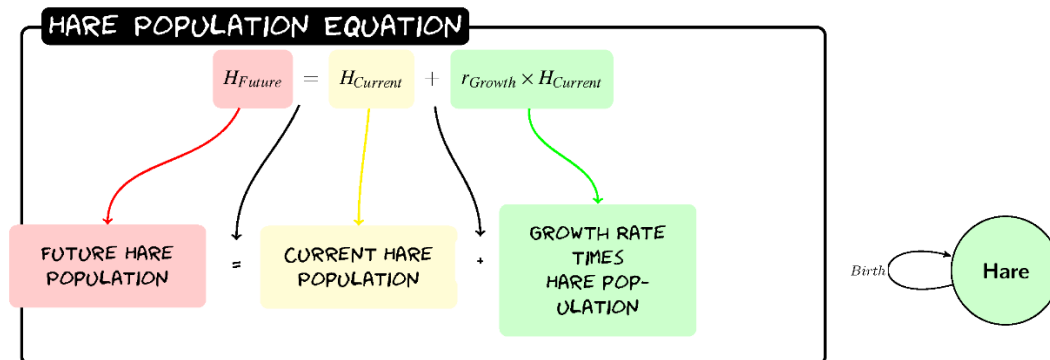
# The Maths of Predators and Preys

## Don't get Eaten by the Wolf

### Hares



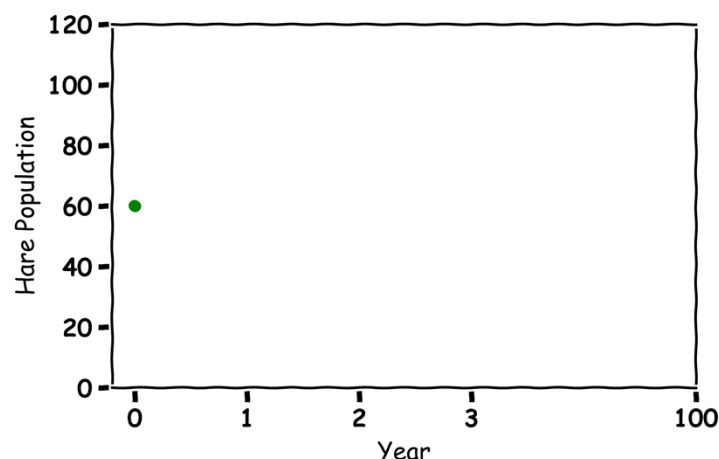
No predators



Given a population of 60 Hares and a growth rate of 0.2 what would the population be after three years?

Year	Hare Population
0	60
1	
2	
3	

Sketch the Graph.

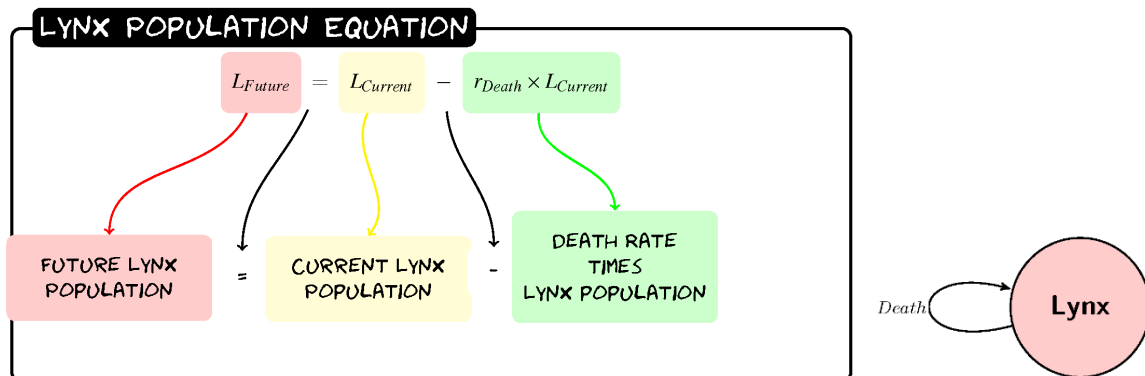


Guess what would happen in 100 years?



# Lynx

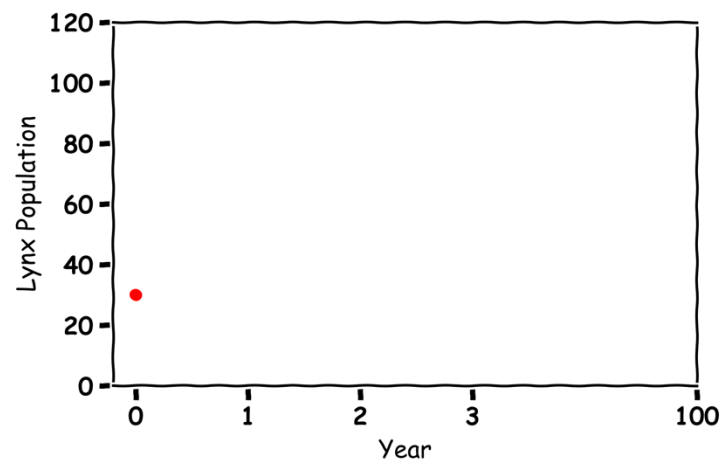
No Prey



Given a population of 30 Lynxes and a death rate of 0.1 what would the population be after three years?

Year Lynx Population	
0	30
1	
2	
3	

Sketch the Graph.

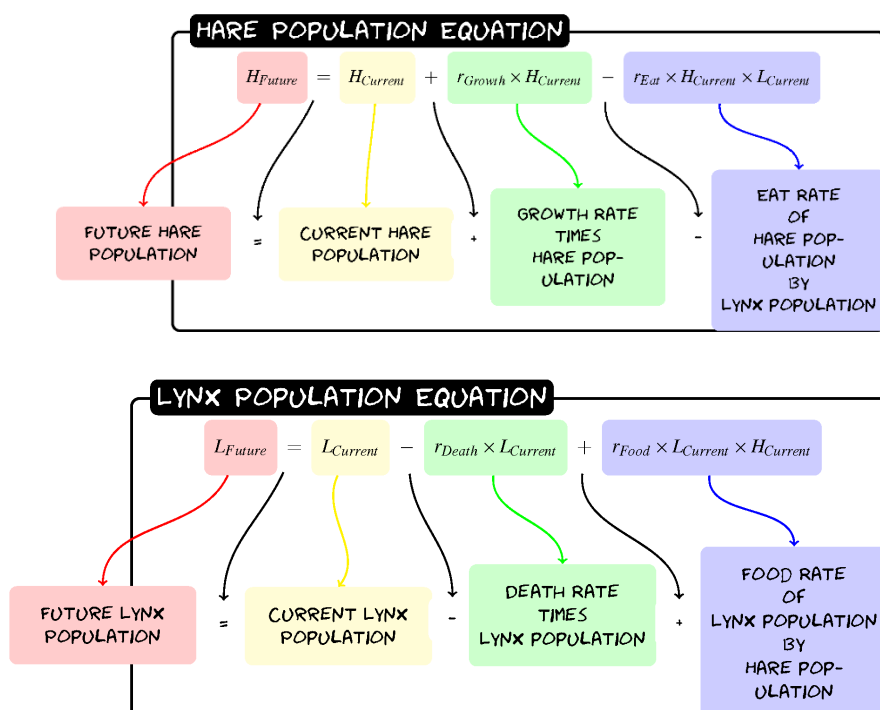
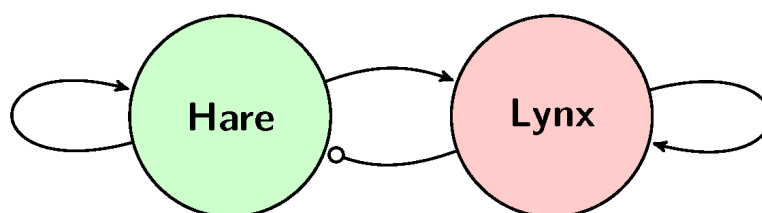


Guess what would happen in 100 years?



## Hares and Lynxes

Label the graph:



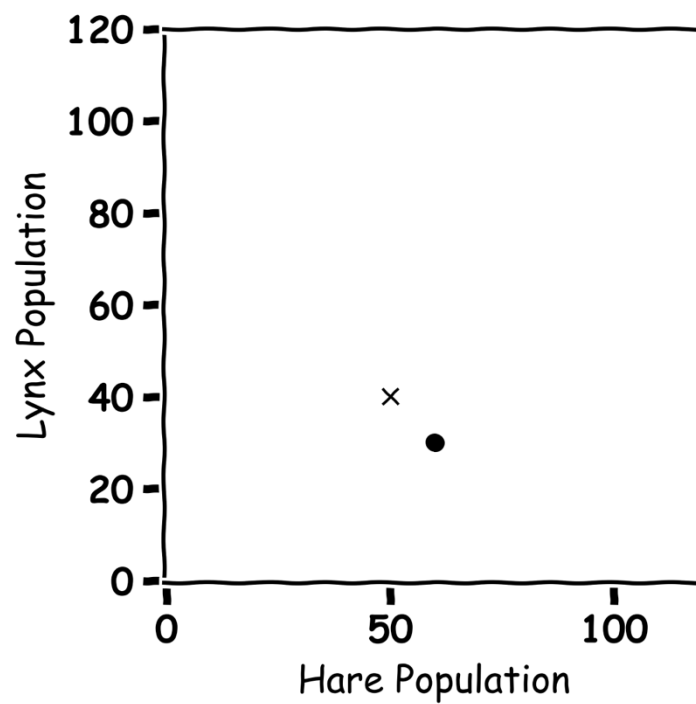
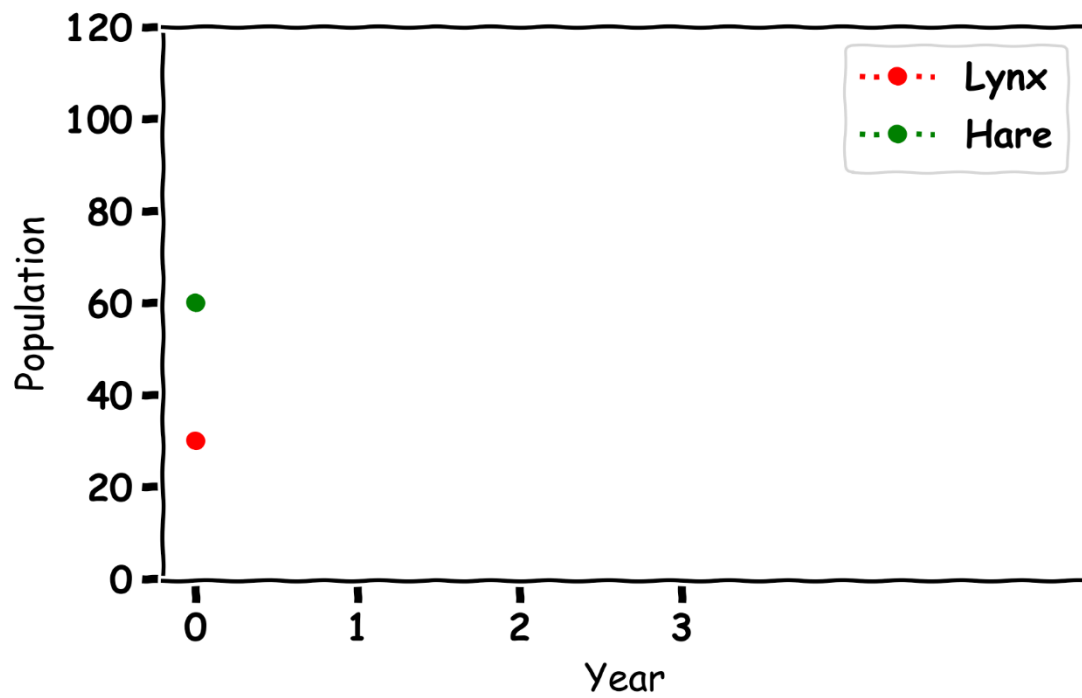
Given a population of 60 Hares and 30 Lynxes with a birth rate of .2, a death rate of 0.1, a eat rate of 0.005 and a food rate of 0.002 what would the populations be after three years?

Hare	Hare	Lynx	Value
Growth	0.2	Death	0.1
Eat	0.005	Food	0.002

Year	Hare Population	Lynx Population
0	60	30
1		
2		
3		



Sketch the graph:

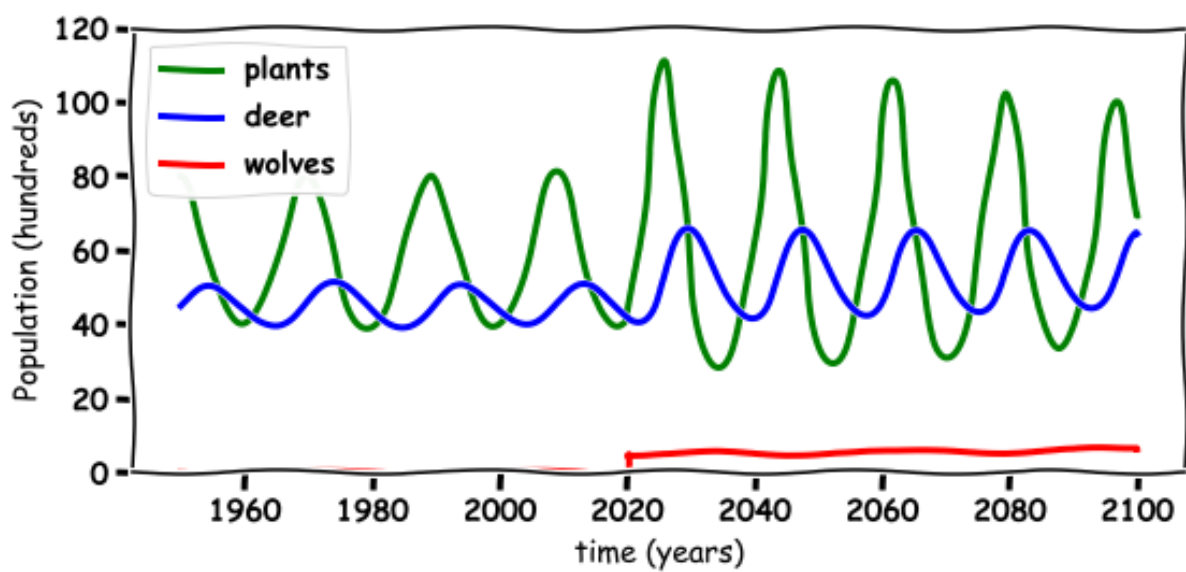
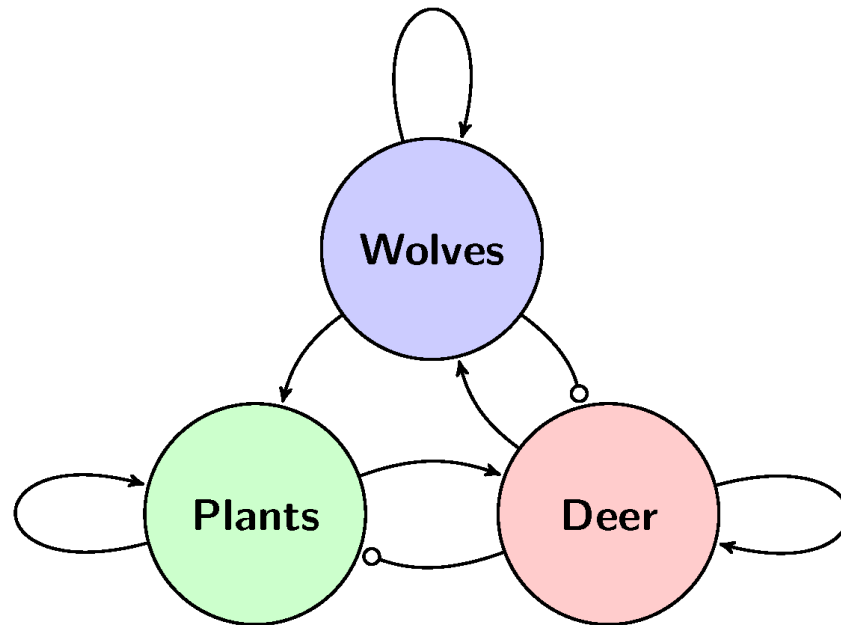






# Don't get Eaten by the Wolf

Label the graph





# FEEDBACK

## General Experience

What did you enjoy most about the workshop?

Was there anything you found challenging or unclear during the session?

On a scale of 1 to 5, how engaging did you find the workshop? (1 = Not engaging, 5 = Very engaging)

1                      2                      3                      4                      5

## Content and Delivery

Were the topics covered relevant and interesting to you? (1 = Not interesting, 5 = Very interesting)

1                      2                      3                      4                      5

Was the pace of the workshop appropriate? (1=Too slow,3= Just right, 5=Too fast)

1                      2                      3                      4                      5

Did the examples or exercises help you understand the concepts better? (1 = Not helpful, 5 = Very helpful)

1                      2                      3                      4                      5

Was the presenter clear and easy to follow? (1 = Not clear, 5 = Very clear)

1                      2                      3                      4                      5

## Suggestions for Improvement

What would you like to see more of in future workshops?

Is there any topic you think we should include next time?

How could we improve your overall experience?