

# SER 321 B Session

**SI Session**

**Thursday, November 21st 2024**

*7:00 pm - 8:00 pm MST*

# Agenda



Distributed Structures

Process Flow

Consensus!

What does it mean?

Primary Types

RAFT

# SI Session Expectations

Thanks for coming to the **SER 321** SI session. We have a packed agenda and we are going to try to get through as many of our planned example problems as possible. This session will be recorded and shared with others.

- If after this you want to see additional examples, please visit the drop-in tutoring center.
- We will post the link in the chat now and at the end of the session.
  - [tutoring.asu.edu](https://tutoring.asu.edu)
- Please keep in mind we are recording this session and it will be made available for you to review 24-48 hours after this session concludes.
- Finally, please be respectful to each other during the session.

# Interact with us:

## Zoom Features



### Zoom Chat

- Use the chat feature to interact with the presenter and respond to presenter's questions.
- Annotations are encouraged

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**Assignment 5 PSA**

No starter code for this assignment



Don't panic - you have options!

# SER 321

## Assignment 5 PSA

No starter code for this assignment

Use a previous  
assignment as a  
starting point

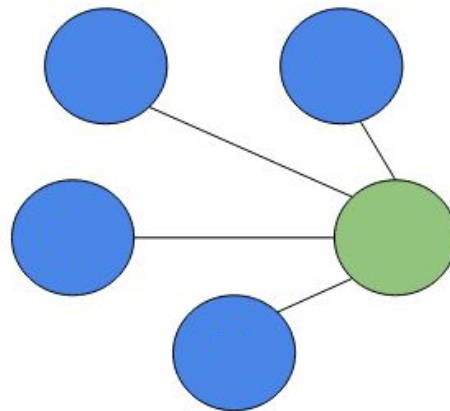
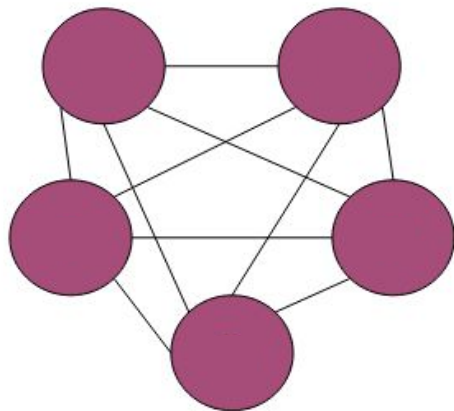
Use a repo  
example as a  
starting point

Build from scratch

Main and Worker

Peer to Peer

Which is which?



***Check out the recording for the discussion!***

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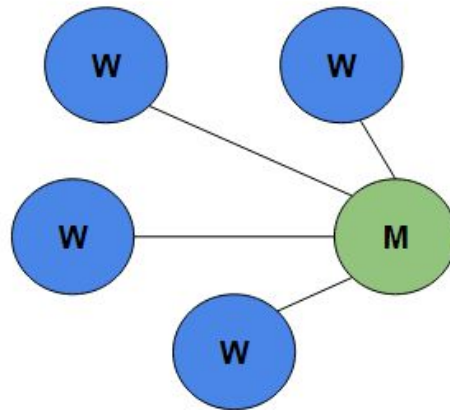
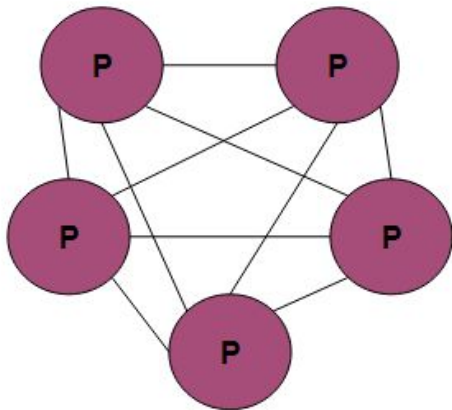
**Distributed Systems**

Main and Worker

Peer to Peer

Which is which?

Peer to Peer



Main and  
Worker

*Check out the recording for the discussion!*



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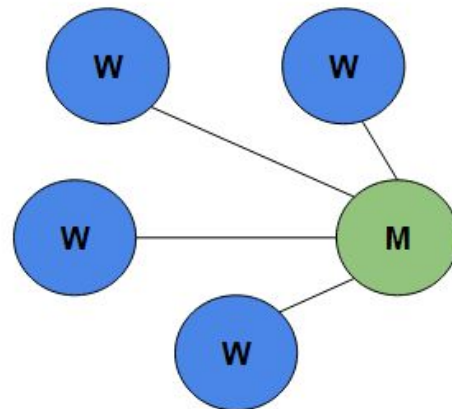
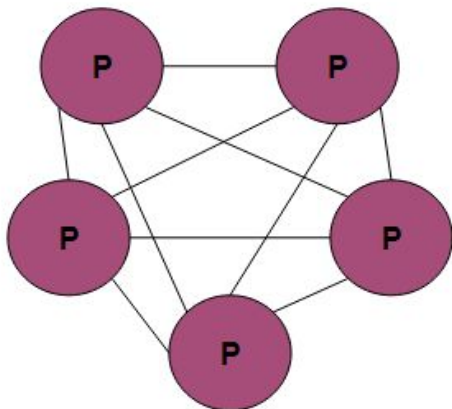
**Distributed Systems**

Main and Worker

Peer to Peer

How many classes are used?

Peer to Peer



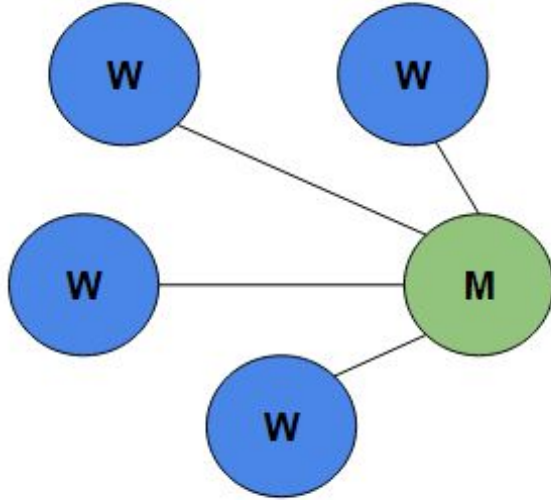
Main and  
Worker

*Check out the recording for the discussion!*

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**Distributed Systems**

# Pros and Cons



Pros:

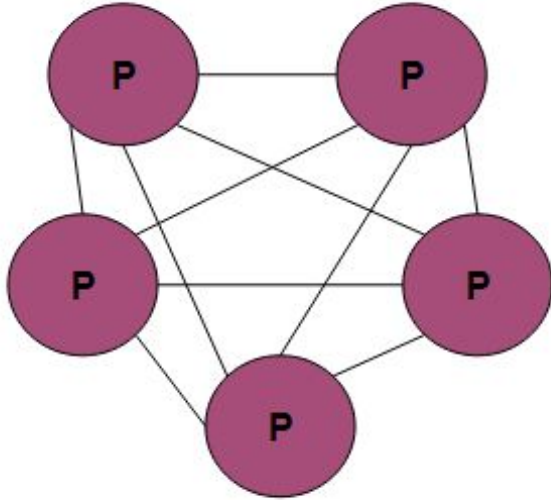
Cons:

***Check out the recording for the discussion!***

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**Distributed Systems**

# Pros and Cons



Pros:

Cons:

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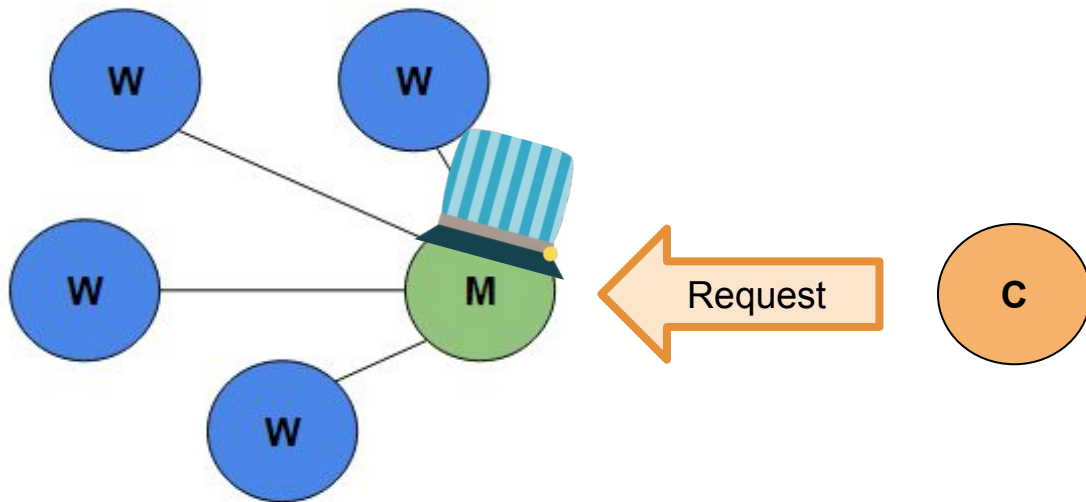
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**Distributed Systems**

Process Flow!

DATA

Workers  
only do  
their task  
then report  
back



Main is like our server

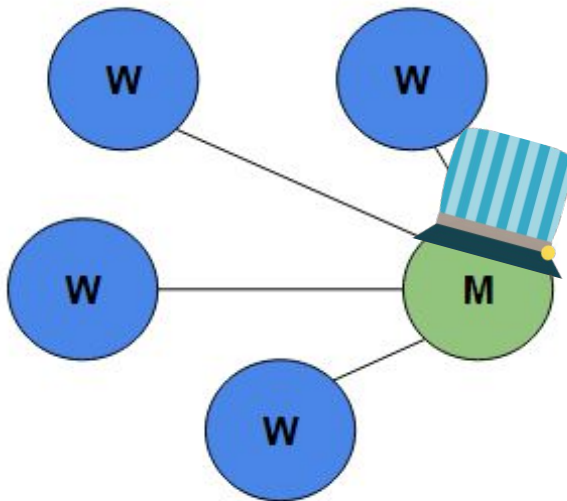
*Check out the recording for the discussion!*

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**Distributed Systems**

## Process Flow!

Workers  
only do  
their task  
then report  
back



DATA



D1

D2

D3

D4

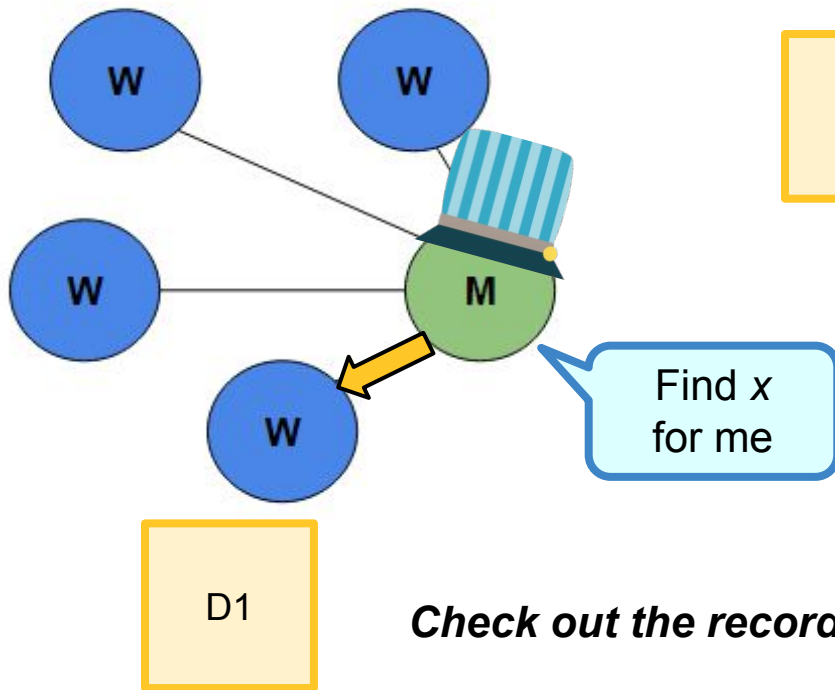
*Check out the recording for the discussion!*

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**Distributed Systems**

## Process Flow!

Workers  
only do  
their task  
then report  
back



DATA



D1

D2

D3

D4

D1

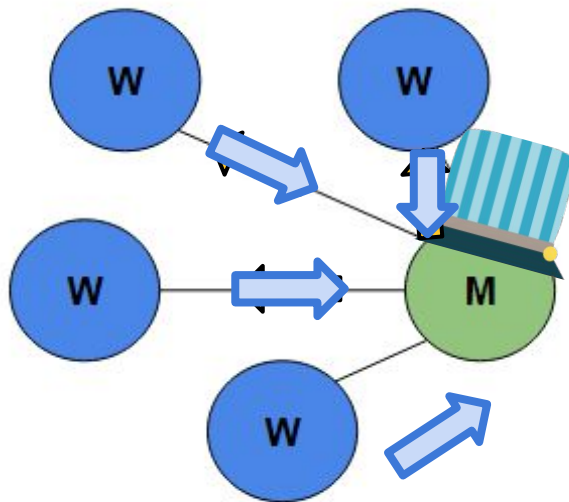
*Check out the recording for the discussion!*

**SER 321**

**Distributed Systems**

## Process Flow!

Workers  
only do  
their task  
then report  
back



D1

DATA



D1

D2

D3

D4

D1  
Result

D2  
Result

D3  
Result

D4  
Result

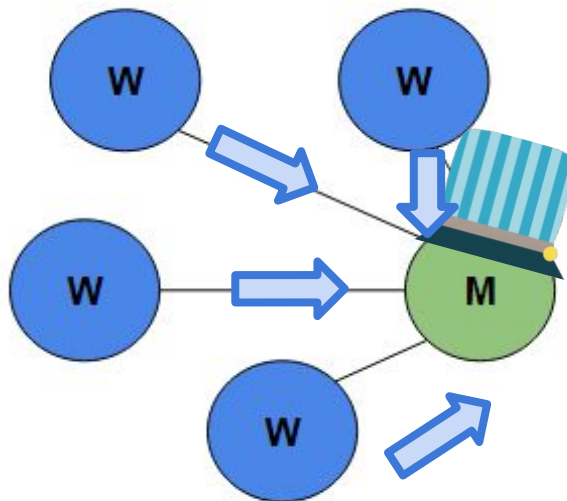
*Check out the recording for the discussion!*

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**Distributed Systems**

*Check out the recording for the discussion!*

Workers  
only do  
their task  
then report  
back



D1

Process Flow!

DATA



D1

D2

D3

D4

D1  
Result

D2  
Result

D3  
Result

D4  
Result



RESULTS



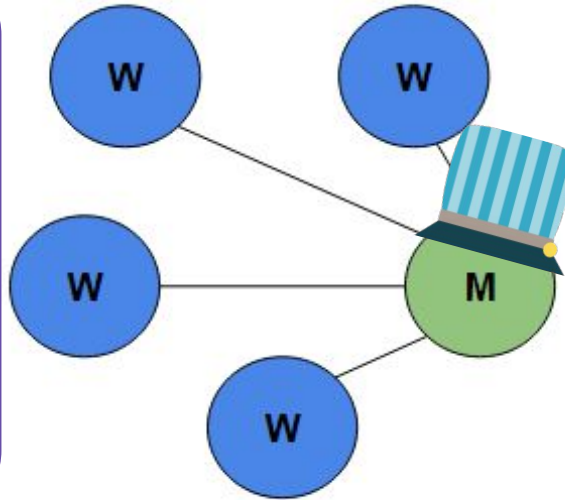
*Check out the recording for the discussion!*

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**Distributed Systems**

Does this look familiar?

How is this different from a parallel processing model?



D1

DATA



D1

D2

D3

D4

D1  
Result

D2  
Result

D3  
Result

D4  
Result



RESULTS

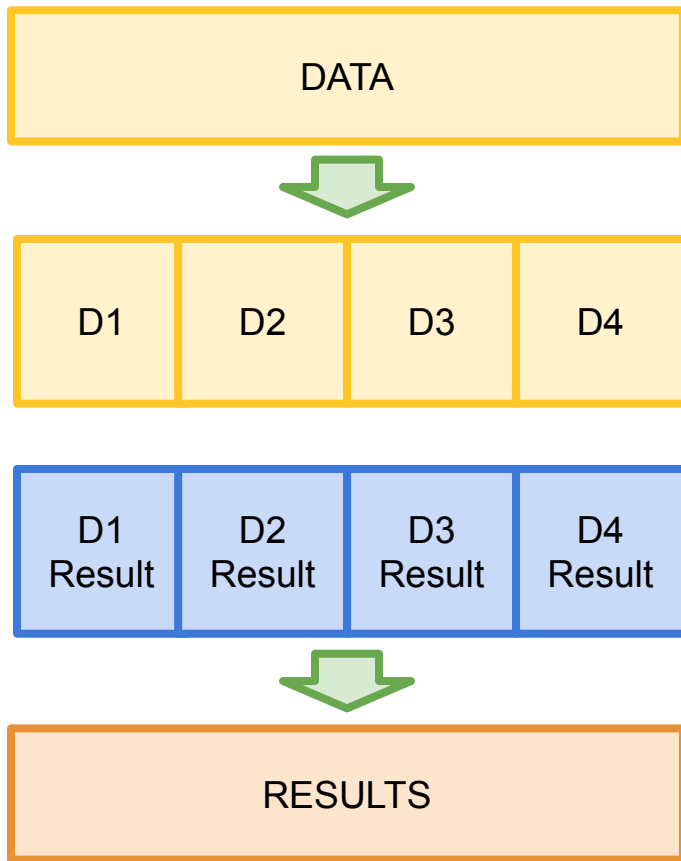
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**Distributed Systems**

What about Peer to Peer?

Would this sequence  
*(the data handling)* change  
in the different structure?

***Check out the recording for the discussion!***



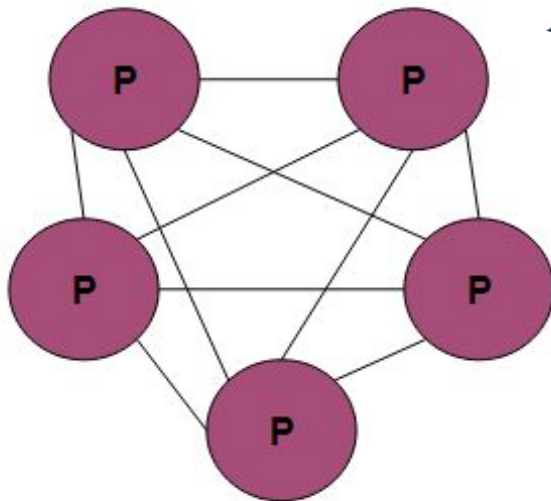
# SER 321

## Distributed Systems

*Check out the recording for the discussion!*

We want  
someone to  
wear the  
conductor  
hat!

A **LEADER**



How do we choose a leader?

# What about Peer to Peer?

DATA



D1

D2

D3

D4

D1  
Result

D2  
Result

D3  
Result

D4  
Result



RESULTS

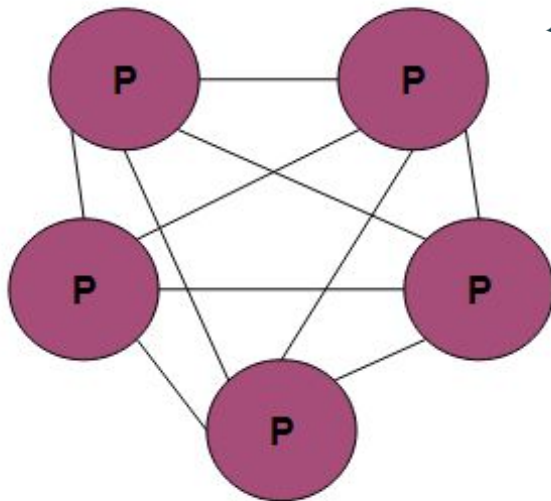
**SER 321**

**Distributed Systems**

*Check out the recording for the discussion!*

We want  
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wear the  
conductor  
hat!

A **LEADER**



**Leader Election!**

What about Peer to Peer?

DATA



D1

D2

D3

D4

D1  
Result

D2  
Result

D3  
Result

D4  
Result



RESULTS

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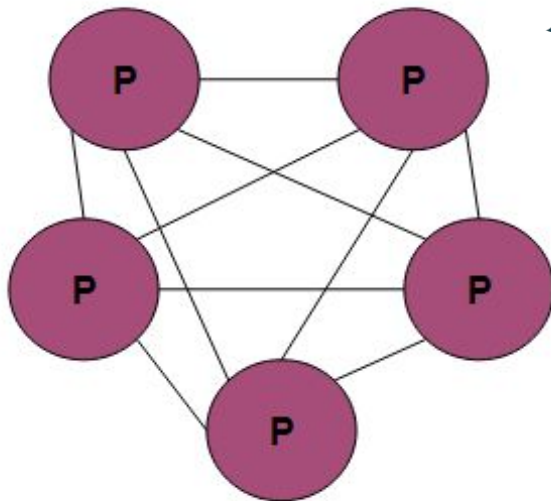
**Distributed Systems**

What about Peer to Peer?

*Check out the recording for the discussion!*

We want  
someone to  
wear the  
conductor  
hat!

A **LEADER**



**Leader Election!**

Type of  
**CONSENSUS**

What's  
consensus?



“General agreement or  
trust amongst a group”

# SER 321

## Consensus

“General agreement or trust amongst a group”

## Types of Consensus?

Leader Election



Who's in charge or keeping the beat

Verify Results



Check your work with a neighbor

***Check out the recording for the discussion!***

Synchronize Data



Verify and maintain my copy of the data

Validate Nodes



Do I want to let you into my network

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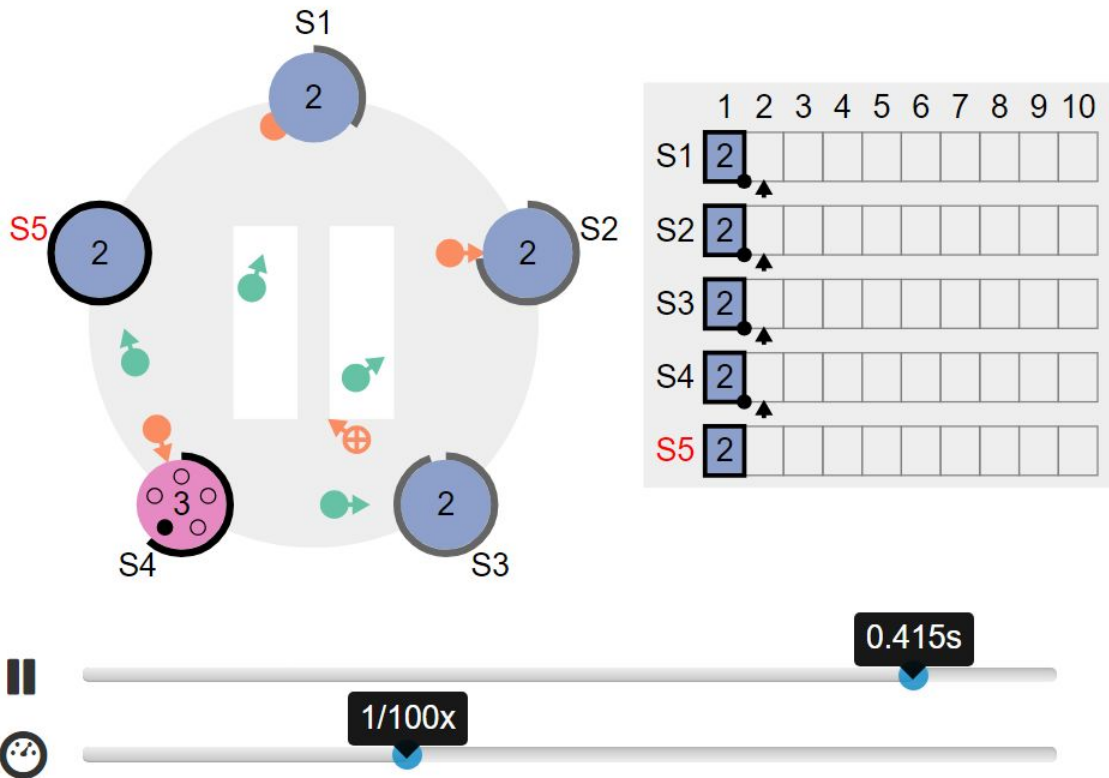
## RAFT

*Check out the recording for the discussion!*

RAFT is a  
great  
consensus  
example!

Leader Election

Log Replication



The Secret Lives of Data is a different visualization of Raft. It's more guided and less interactive, so it may be a gentler starting point.

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**RAFT**

## Leader Election

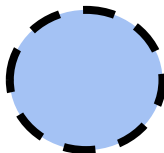
*Check out the recording for the discussion!*

Nodes have 3 states:

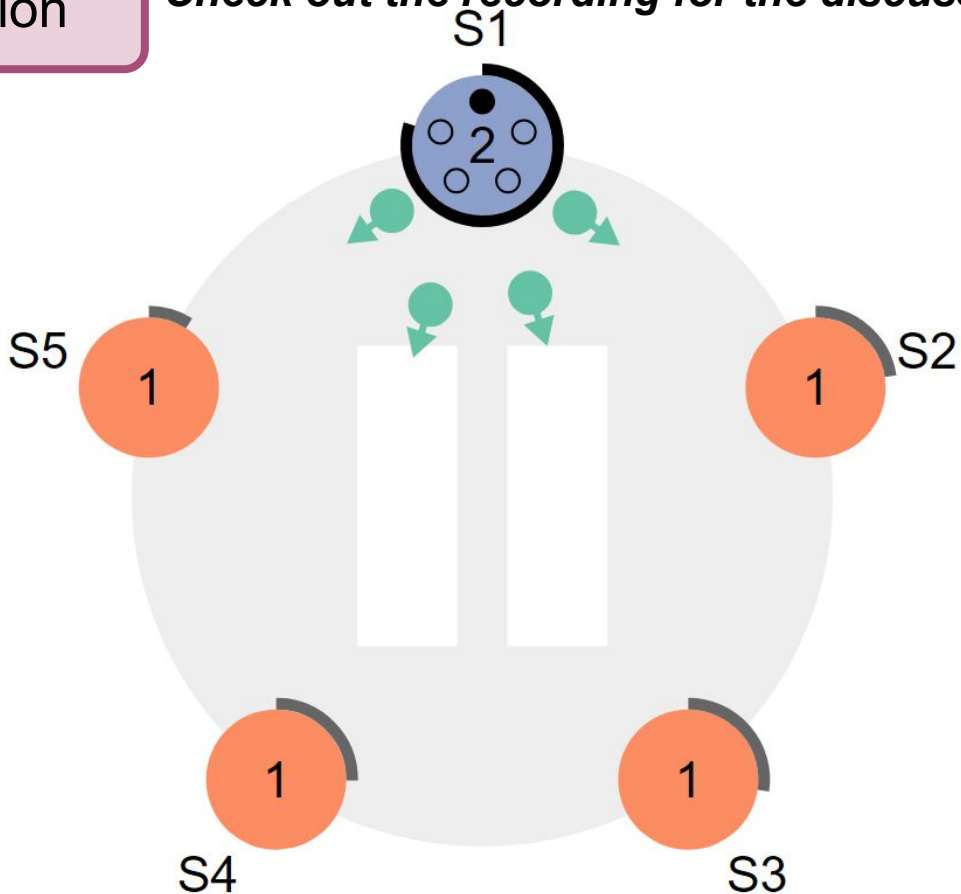
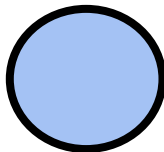
Follower



Candidate



Leader





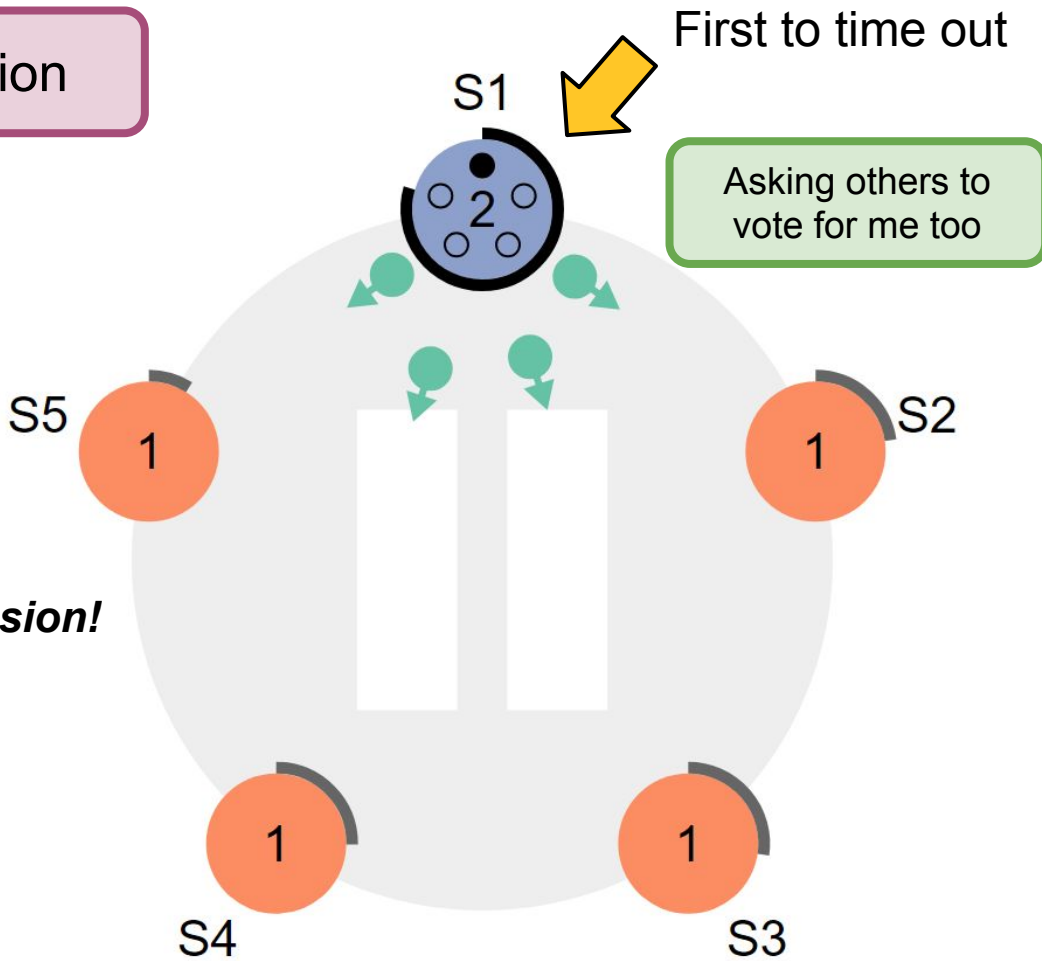
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**RAFT**

Leader Election

This is the first election

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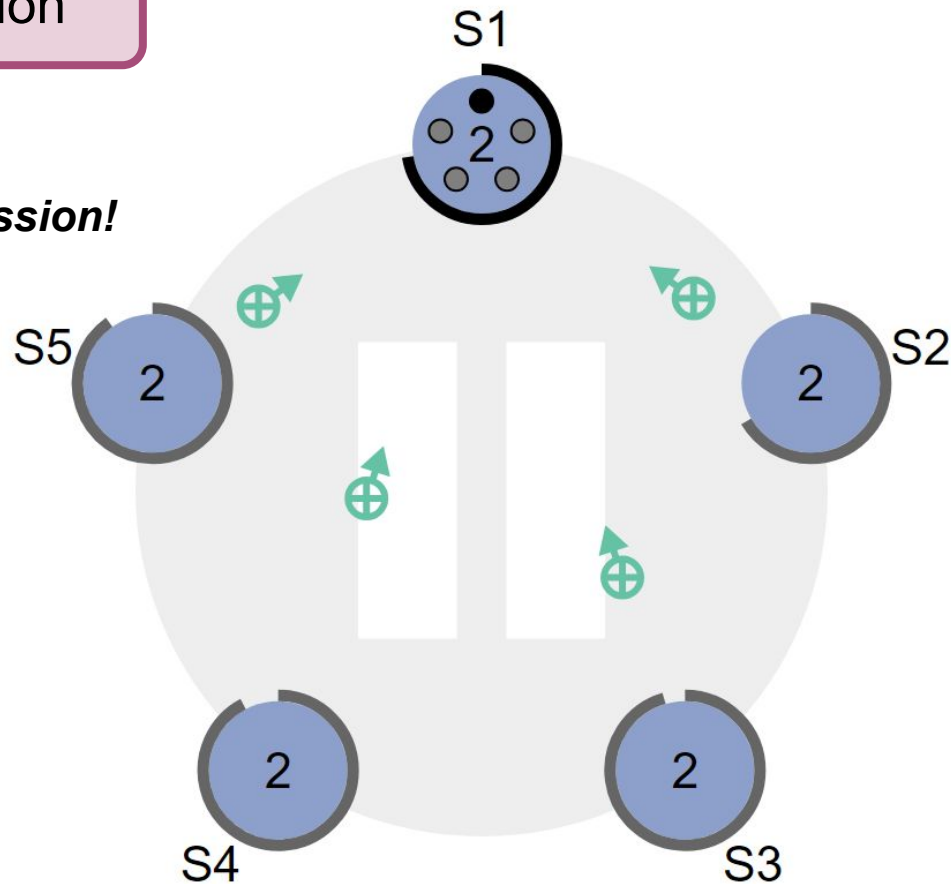
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**RAFT**

## Leader Election

*Check out the recording for the discussion!*

Other nodes said  
sure whatever



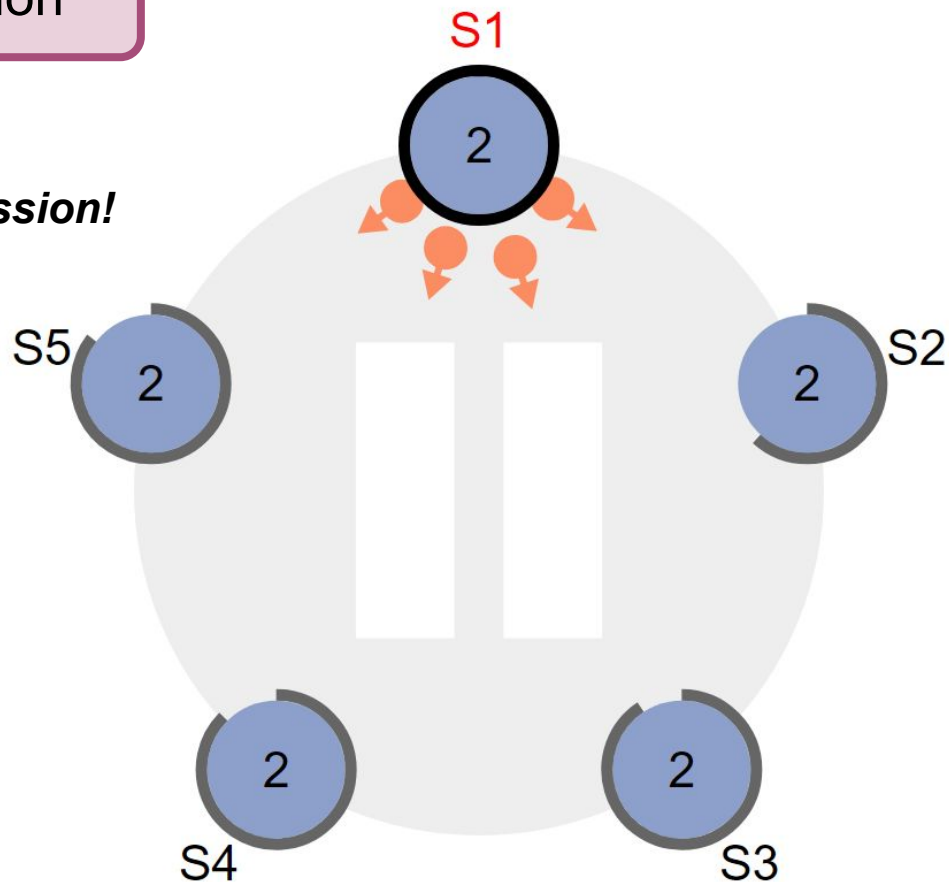
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**RAFT**

## Leader Election

*Check out the recording for the discussion!*

Now confirmed  
as Leader



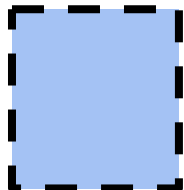
**RAFT**

# Log Replication

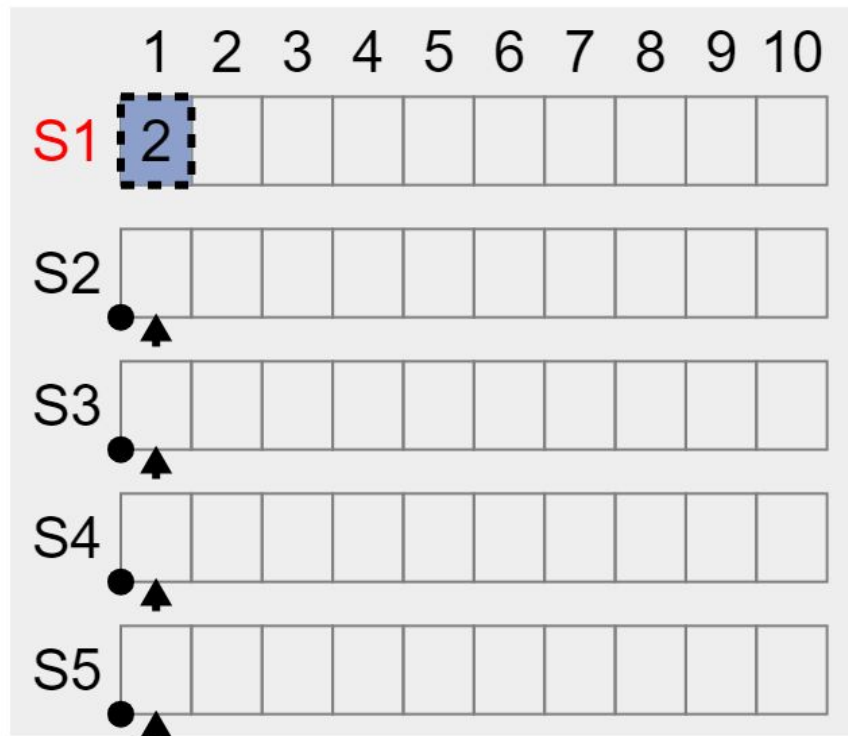
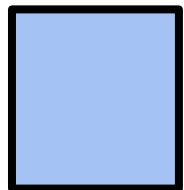
***Check out the recording for the discussion!***

# Same Pattern!

## Candidate



# Added



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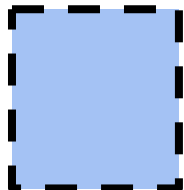
**RAFT**

Log Replication

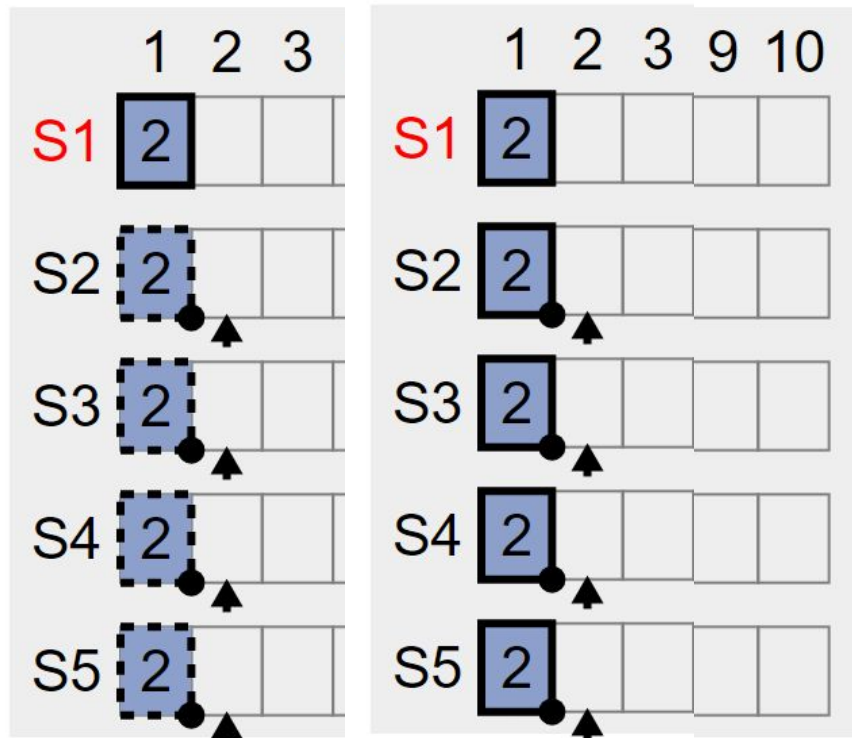
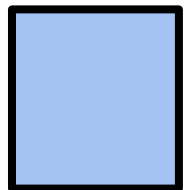
*Check out the recording for the discussion!*

Same Pattern!

Candidate



Added

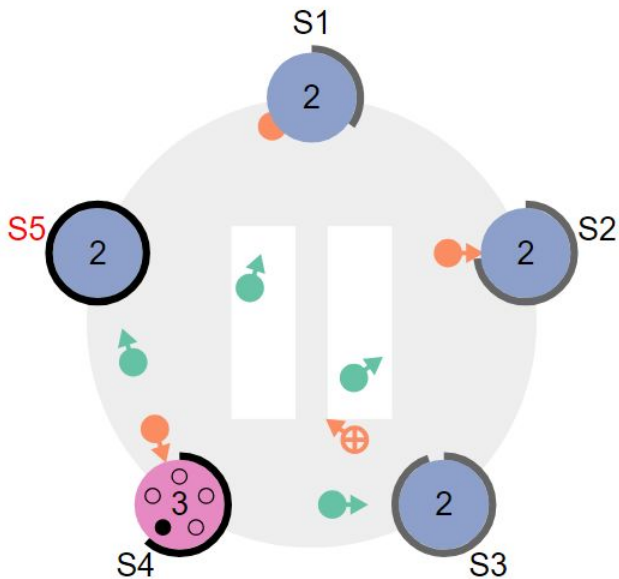


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**RAFT**

*Check out the recording for the discussion!*

RAFT



	1	2	3	4	5	6	7	8	9	10
S1	2									
S2	2									
S3	2									
S4	2									
S5	2									



1/100x

0.415s

# SER 321

Scratch Space

## Upcoming Events

### SI Sessions:

- Sunday, November 24th at 7:00 pm MST
- Tuesday, November 26th at 10:00 am MST
- ~~Thursday, November 28th at 7:00 pm MST~~ **CANCELLED - Happy Thanksgiving!**
- Sunday, December 1st at 7:00 pm MST - **2 hour Review Session**

### Review Sessions:

- Sunday, December 1st at 7:00 pm MST - **2 hour Review Session**
- Tuesday, December 3rd at 10:00 am MST - **Q&A Session**



# Questions?

## Survey:

<https://asuasn.info/ASNSurvey>



# More Questions?

Check out our other resources!

tutoring.asu.edu



## Academic Support

Academic Support Network (ASN) provides a variety of free services in-person and online to help currently enrolled ASU students succeed academically.

### Services



#### Subject Area Tutoring

Need in-person or online help with math, science, business, or engineering courses? Just hop into our Zoom room or drop into a center for small group tutoring. We'll take it from there.

[Need help using Zoom?](#)

[View the tutoring schedule](#)

[View digital resources](#)

Go to Zoom



#### Writing Tutoring

Need help with undergraduate or graduate writing assignments? Schedule an in-person or online appointment, access your appointment link, or wait in our drop-in queue.

[Access your appointment link](#)

[Access the drop-in queue](#)

Schedule Appointment



#### Online Study Hub

Join our online peer communities to connect with your fellow Sun Devils. Engage with our tools to search our bank of resources, videos, and previously asked questions. Or, ask our Tutorbot questions.

Now supporting courses in Math, Science, Business, Engineering, and Writing.

Online Study Hub

1-

Go to Zoom

2-

[Need help using Zoom?](#)

[View the tutoring schedule](#)

[View digital resources](#)



1. Click on 'Go to Zoom' to log onto our Online Tutoring Center.
2. Click on 'View the tutoring schedule' to see when tutors are available for specific courses.

# More Questions?

## Check out our other resources!

[tutoring.asu.edu/online-study-hub](https://tutoring.asu.edu/online-study-hub)

 **Academic Support Network**

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[University College](#)

## Online Study Hub

Online peer communities for students and tutors, YouTube channels, and Tutorbots.



### What are online peer communities?

Individual courses have an online peer community that allows you to connect with your peers to post and answer questions and to develop study groups.



### How can tutoring center videos help?

Videos can help supplement the learning you're doing in and outside of class and include step-by-step methods for how to understand concepts.



### How does the Tutorbot work?

You can ask the Tutorbot questions about course concepts and the Tutorbot will recommend additional resources and examples to help address your questions.

Select a subject

- Any -

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Business

### ACC 231

Uses of Accounting Info I

 [Peer Community](#)

### ACC 241

Uses of Accounting Info II

 [Peer Community](#)

### CIS 105

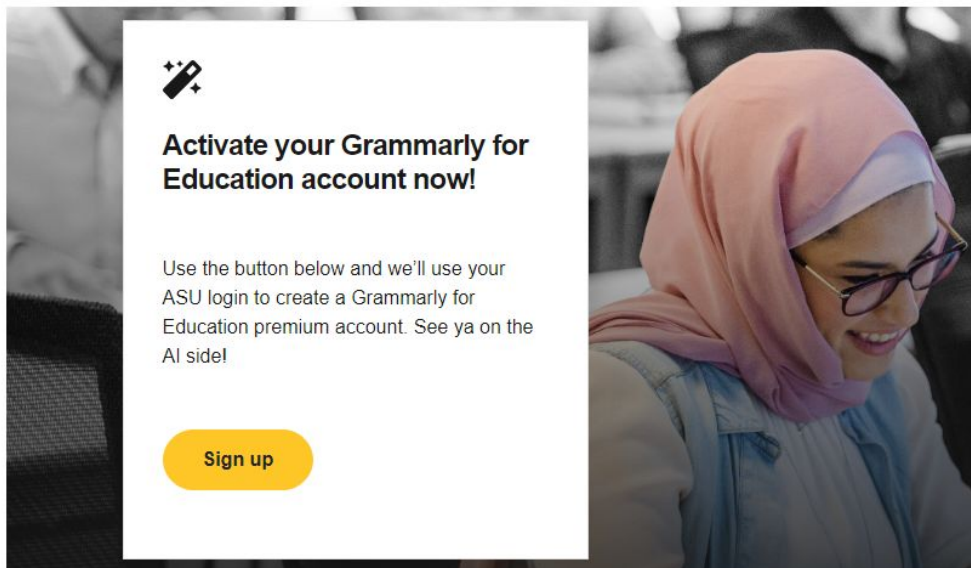
Computer Applications and Information Technology

 [Peer Community](#)

Don't forget to check out the Online Study Hub for additional resources!

# Expanded Writing Support Available

Including Grammarly for Education, at no cost!



[tutoring.asu.edu/expanded-writing-support](https://tutoring.asu.edu/expanded-writing-support)

\*Available slots for this pilot are limited

## Additional Resources

- [Course Repo](#)
- [Gradle Documentation](#)
- [GitHub SSH Help](#)
- [Linux Man Pages](#)
- [OSI Interactive](#)
- [MDN HTTP Docs](#)
  - [Requests](#)
  - [Responses](#)
- [JSON Guide](#)
- [org.json Docs](#)
- [javax.swing package API](#)
- [Swing Tutorials](#)
- [Dining Philosophers Interactive](#)
- [Austin G Walters Traffic Comparison](#)
- [RAFT](#)