

SER 321 B Session

Exam Review Session

Sunday, April 27th 2025

6:00 pm - 8:00 pm MST

Agenda



Exam Information

Study Guide PSA

General Review!

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
- 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

SER 321

Exam Information

[Exam Info Page](#)

80 minutes

Similar to the
quizzes

Make sure to look at
the Study Guide!

Opens: Wednesday
April 30th
@ 12:30 AM

Closes: Friday
May 2nd
@ 11:59:59 PM

Front and Back!

MUST BE *Handwritten*



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Review Requests

It's ***not*** too late to make a topic request!

Drop a concept in the chat
and we can cover it next!

Check out the recording for the solution and discussion!

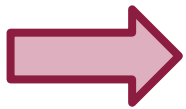
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Unit

Layer

What we are *really*
talking about

OSI Model



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Network Layer - IP

Given the following IP address, identify the...

Port

128.148.32.110:8080

Check out the recording for the solution and discussion!

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Network Layer - IP

Given the following IP address, identify the...

Subnet

128.148.32.110:8080

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Network Layer - IP

Given the following IP address, identify the...

Network

128.148.32.110:8080

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Network Layer - IP

Given the following IP address, identify the...

Host

128.148.32.110:8080

Check out the recording for the solution and discussion!

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TCP & UDP

What are the main differences?

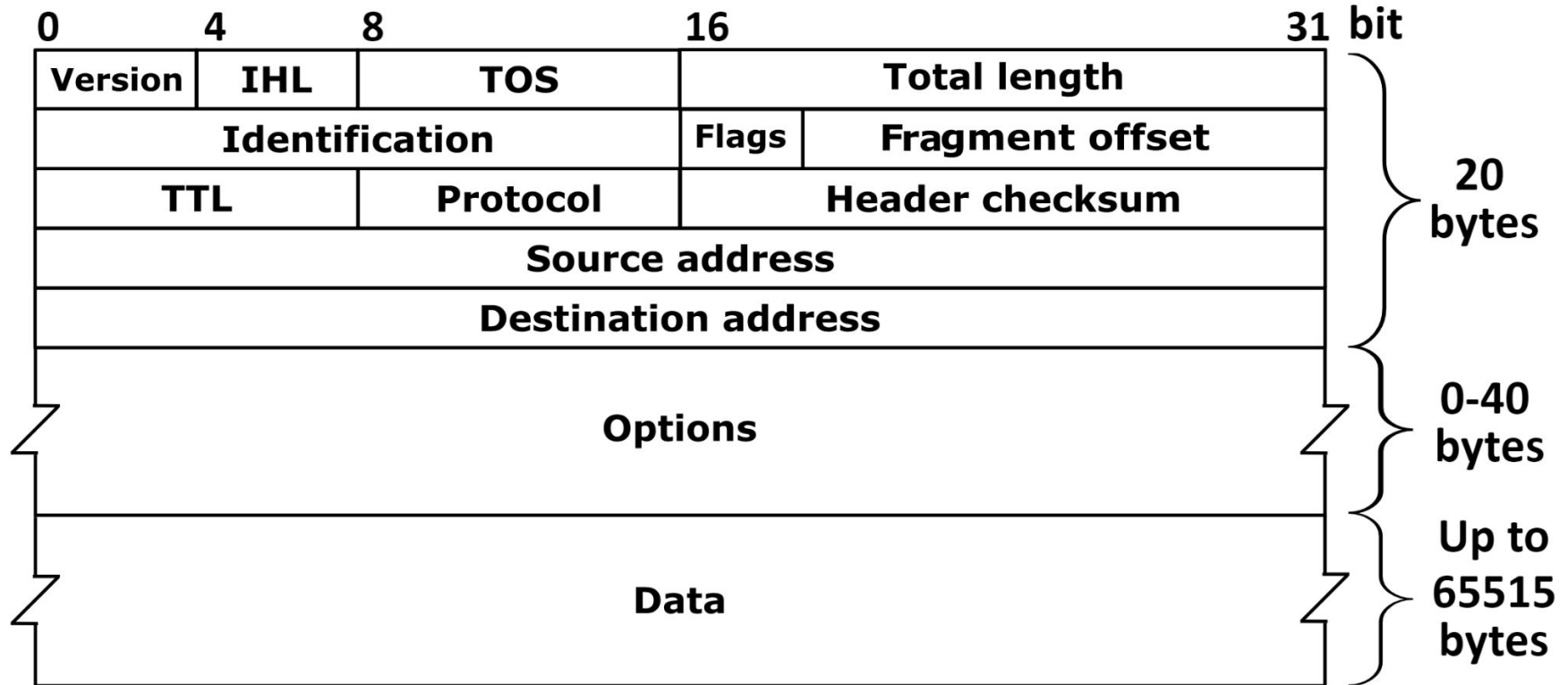
TCP	UDP

Check out the recording for the solution and discussion!

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Headers

What type of header is this?



Check out the recording for the solution and discussion!

Headers

TCP or UDP Header?

Check out the recording for the solution and discussion!

Offsets		0								1								2								3							
Octet	Bit	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
0	0	Source port																Destination port															
4	32	Sequence number																															
8	64	Acknowledgment number (if ACK set)																															
12	96	Data offset				Reserved 0 0 0 0				C W R	E C E	U R G	A C K	P S H	R S T	S Y N	F I N	Window Size															
16	128	Checksum																Urgent pointer (if URG set)															
20	160	Options (if <i>data offset</i> > 5. Padded at the end with "0" bits if necessary.)																															
:	:																																
56	448																																

Headers

TCP or UDP Header?

Check out the recording for the solution and discussion!


Offset	Octet	0								1								2								3							
Octet	Bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0	0	Source Port																Destination Port															
4	32	Length																Checksum															
8	64	Data																															
12	96																																
⋮	⋮																																

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Network Concept Checks

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

```
Interface: 192.168.0.68 --- 0x8
Internet Address Physical
192.168.0.1 ce:83:f
192.168.0.21 f7:f5:1
192.168.0.255 ff-ff-f
224.0.0.22 04-00-5
224.0.0.251 04-00-5
224.0.0.252 04-00-5
239.255.255.250 01-00-5
255.255.255.255 .....
```



Note - numbers have been modified

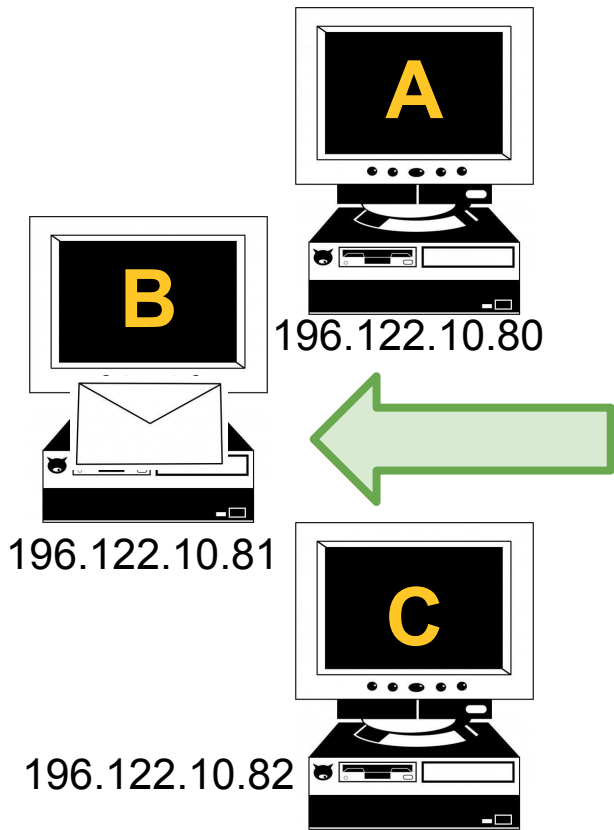
What is an ARP table?

Where does it fit in the OSI model?

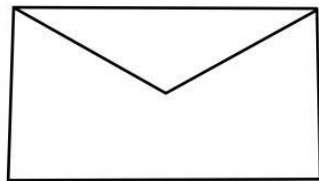
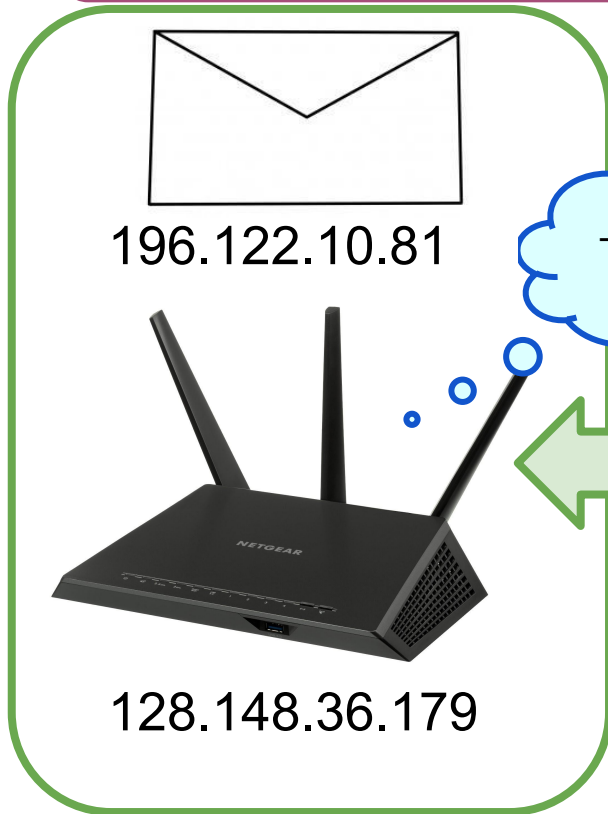
Data	Application	HTTP(s), SMTP, FTP, IMAP, POP, etc.
Data	Presentation	Translation, compression, encryption
Data	Session	AuthN, authZ, session mgmt
Segment	Transport	TCP/UDP
Packet	Network	IP address, routing and delivery
Frame	Data Link	LLC, MAC, data transmission in LAN
Bits	Physical	Signal, Binary transmission

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Network Concept Checks



What is NAT?



128.148.36.179

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

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Lower Layer Matching

Let's do a quick
matching game!

***Check out the recording to see our gameplay, or click the
link to play yourself!***

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Sockets!

Sockets allow our client and server to communicate!

Location

Connection
Semantics

Message Format

Need to define **3 properties** before usage

*Check out
the
recording
for the
discussion!*

IP or DNS

142.251.46.206

www.google.com

TCP or UDP

Connection
Oriented

Connectionless

Protocol Specs

Synchronous

Asynchronous

Stateless

Stateful

Binary

Text

Headers

No Headers

Hello!

Welcome!



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Sockets!

Sockets allow our client and server to communicate!

Person

Conversation
Flow

Conversation
Content

to define **3 properties** before usage

*Check out
the
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IP or DNS

142.251.46.206

www.google.com

TCP or UDP

Connection
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Protocol Specs

Synchronous

Asynchronous

Stateless

Stateful

Binary

Text

Headers

No Headers

Hello!

Welcome!



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Socket Protocol Types

Two Main Conversation Models

1. Client Request

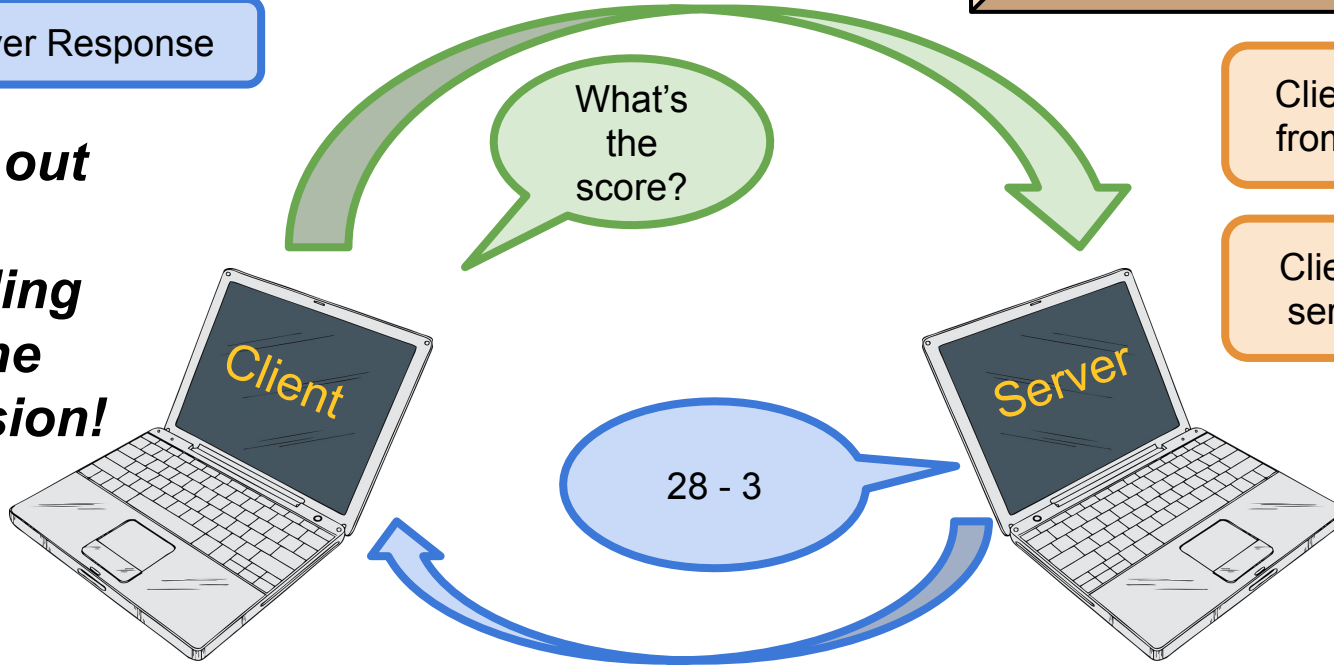
2. Server Response

Pull/Polling Model

Client *pulls* info from the server

Client *polls* the server for info

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



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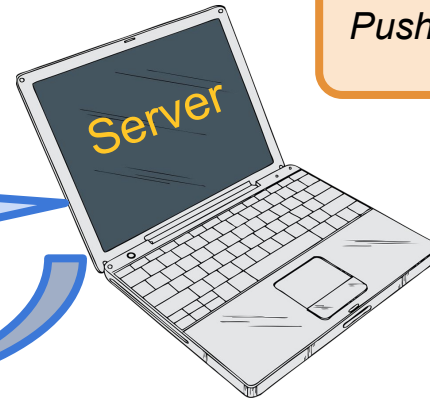
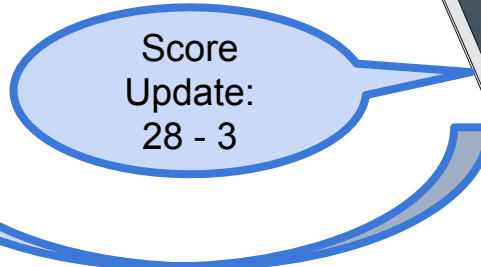
Socket Protocol Types

Two Main Conversation Models

1. Server sends update

2. Client acknowledges

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



Push Model

Server *pushes*
info to client

Push notifications

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Socket Protocol Types

Two Main Conversation Models

Client Push Model

1. Client sends update

2. Server acknowledges

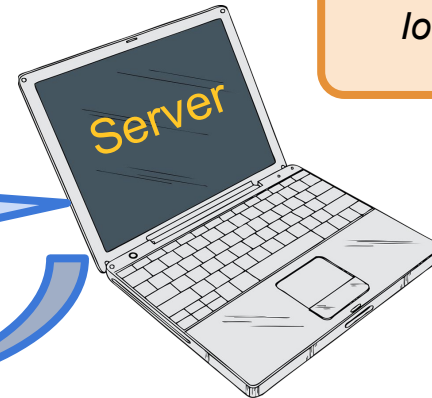
Client *pushes* info to Server

IoT sensors

Here's a temperature update!

Recorded!

Check out the recording for the discussion!



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Client Socket

Steps for the **Client Socket**

1.

2.

3.

4.

5.

6.

7.

8.

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

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Server Socket

Steps
for the
**Server
Socket**

1.

2.

3.

4.

5.

6.

7.

8.

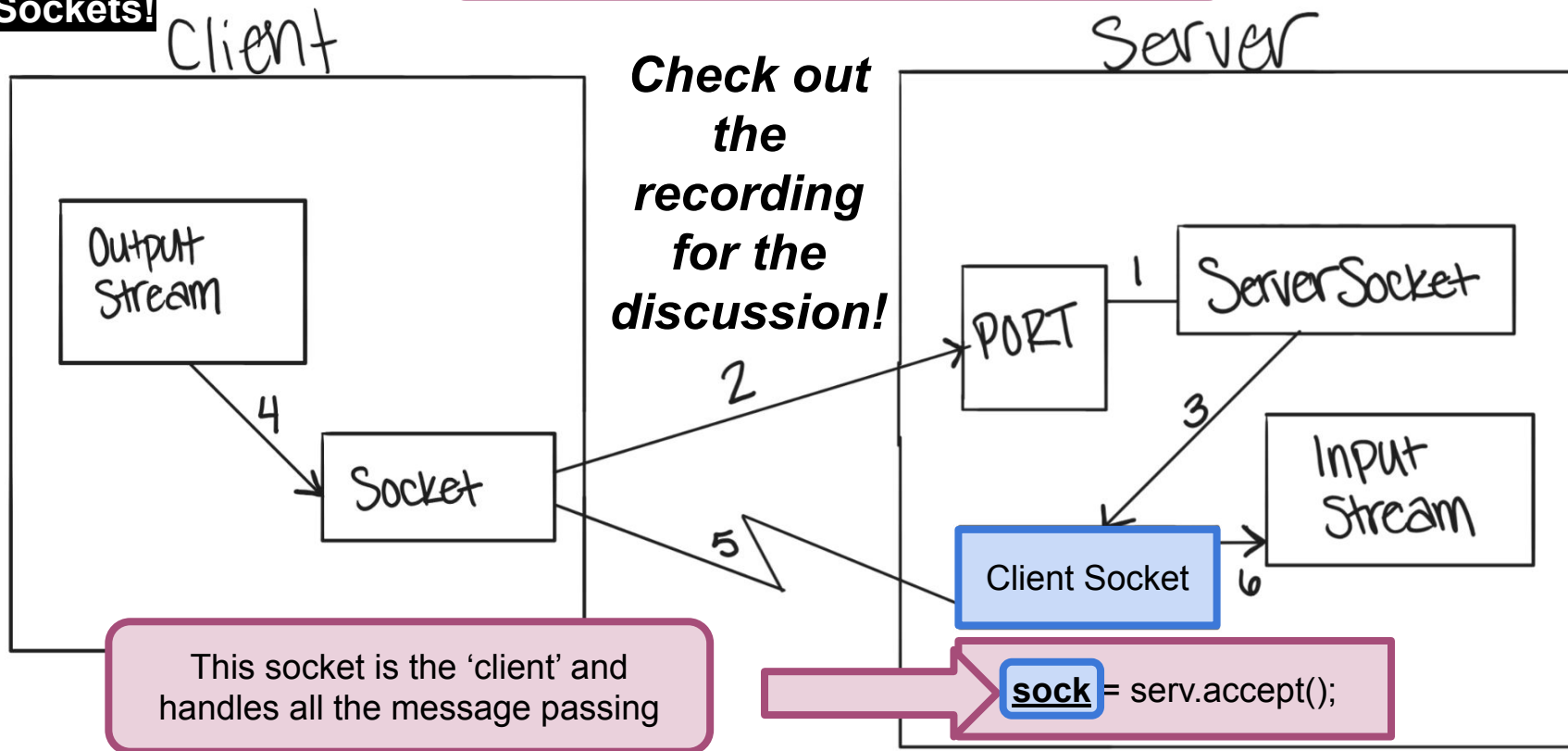
9.

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

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Sockets!

Why do we keep reviewing this?



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Sockets!

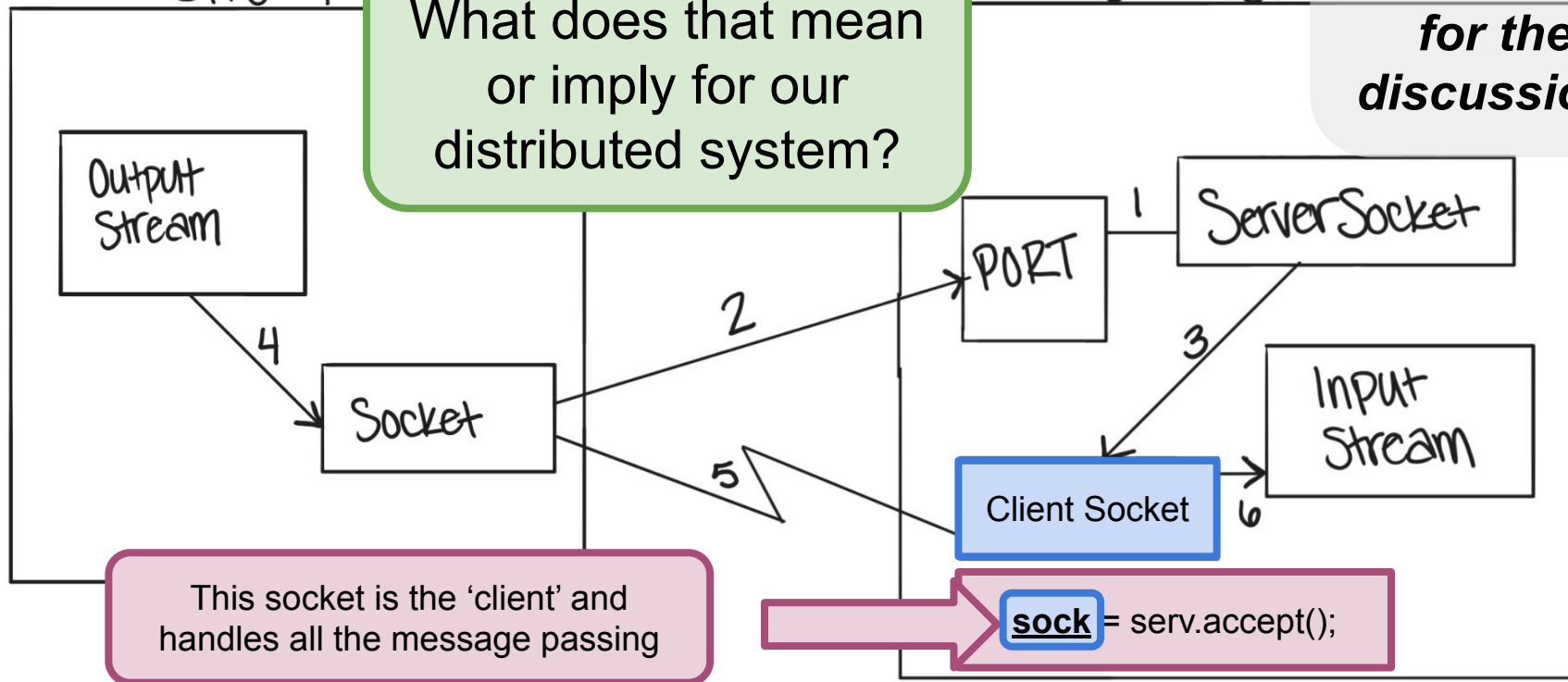
Why do we keep reviewing this?

**Check out
the
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discussion!**

Client

Server

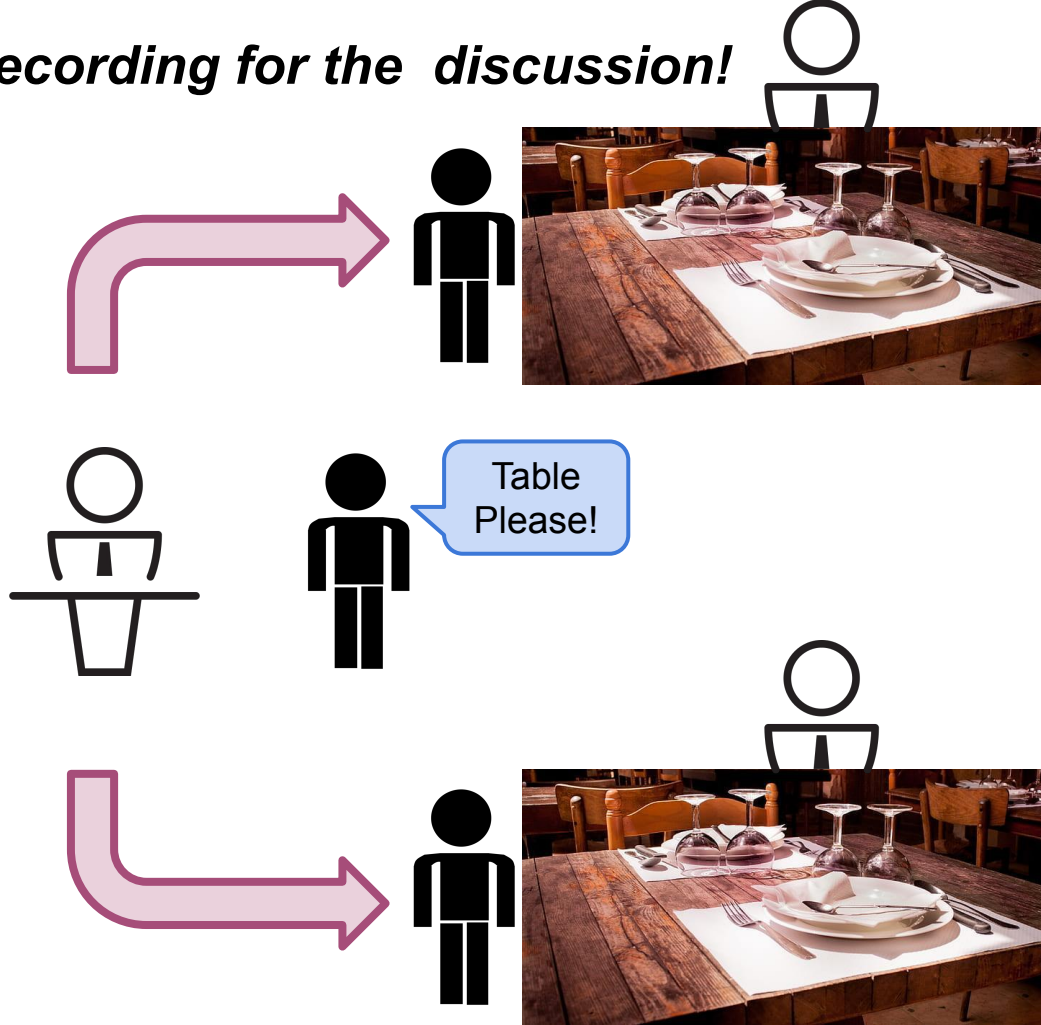
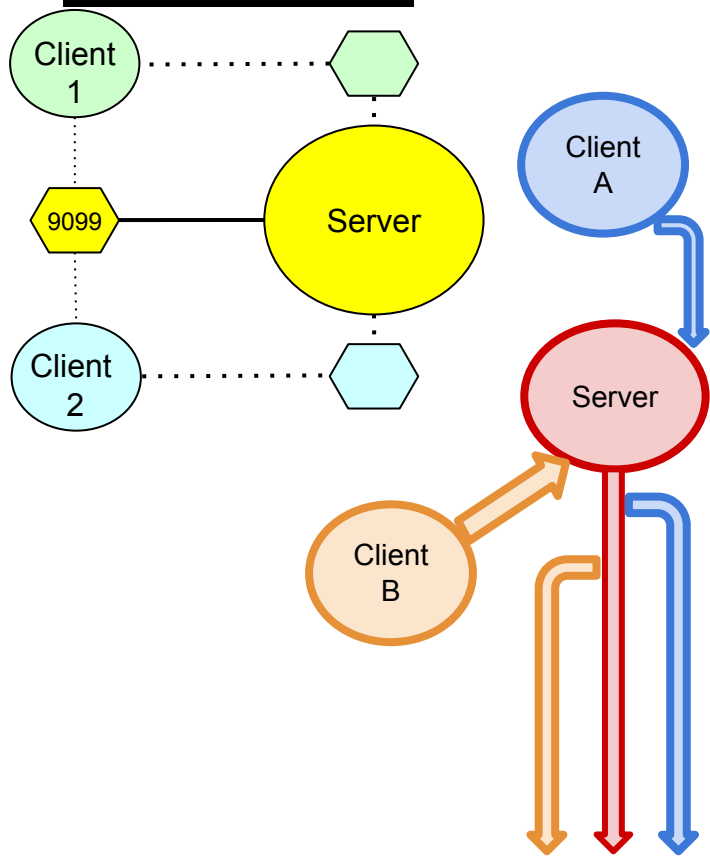
What does that mean
or imply for our
distributed system?



Check out the recording for the discussion!

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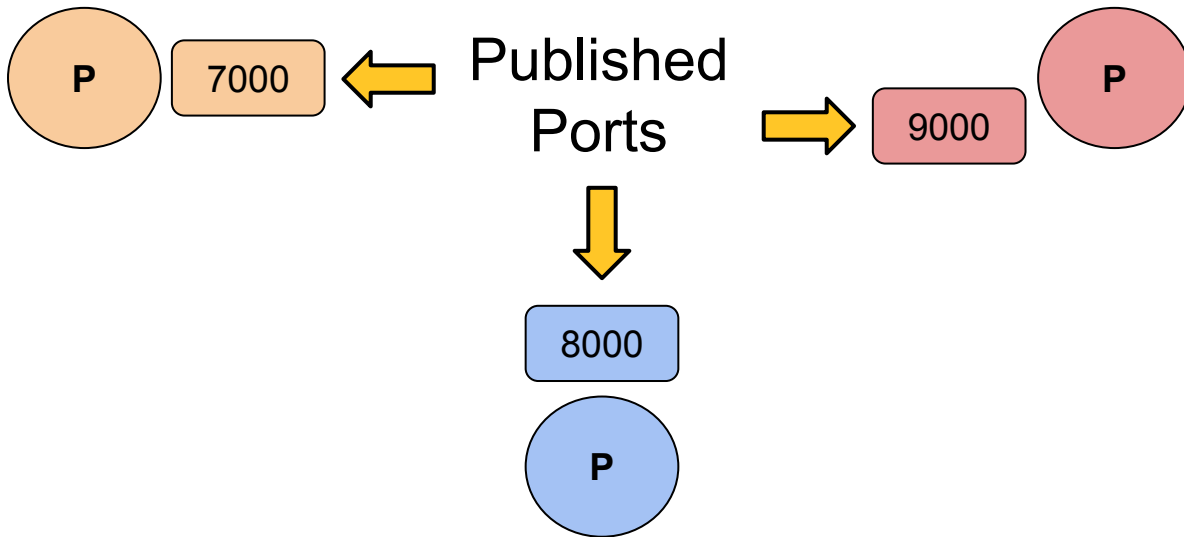
Port Examination



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P2P Communication

Remember that the OS allocates a new port for the client socket!



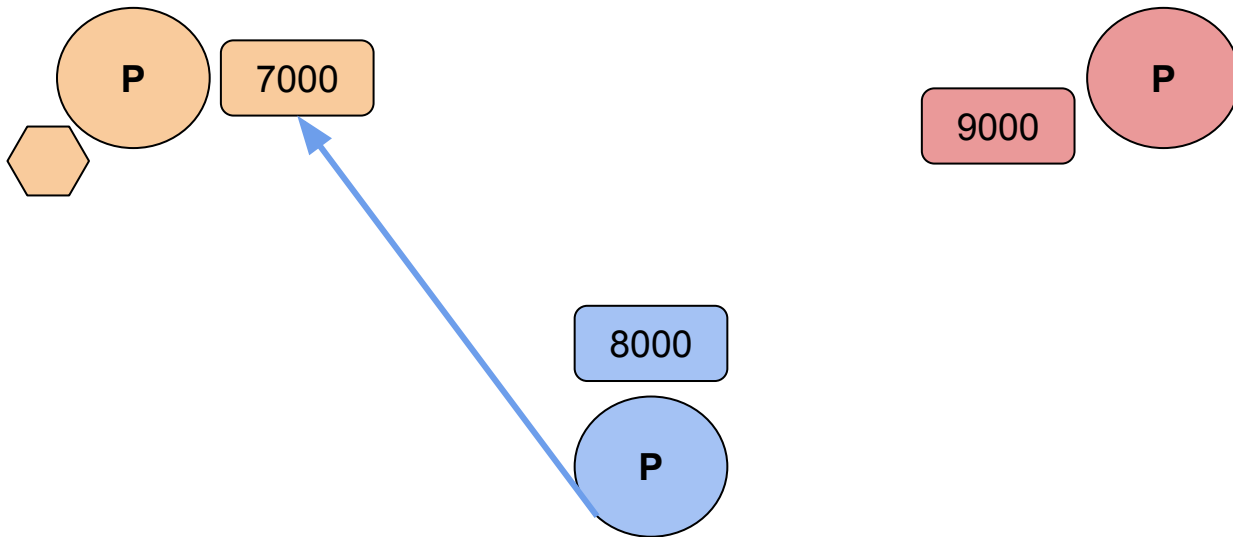
***Check out
the
recording
for the
discussion!***

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P2P Communication

```
sock = server.accept()
```

Remember that the OS allocates a new port for the client socket!



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

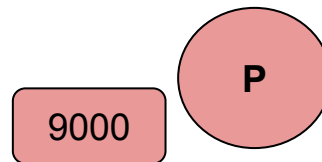
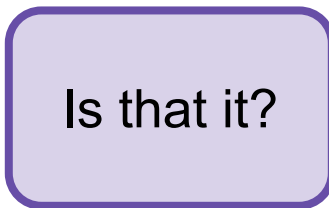
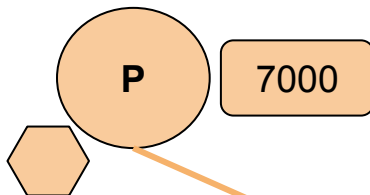
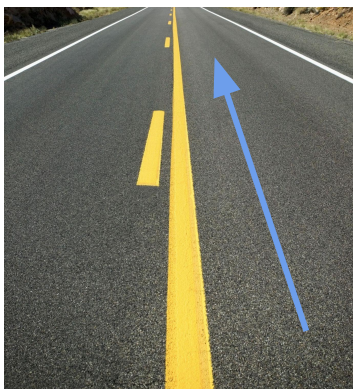
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P2P Communication

```
sock = server.accept()
```

Remember that the OS allocates a new port for the client socket!

Is that it?

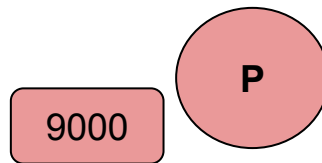
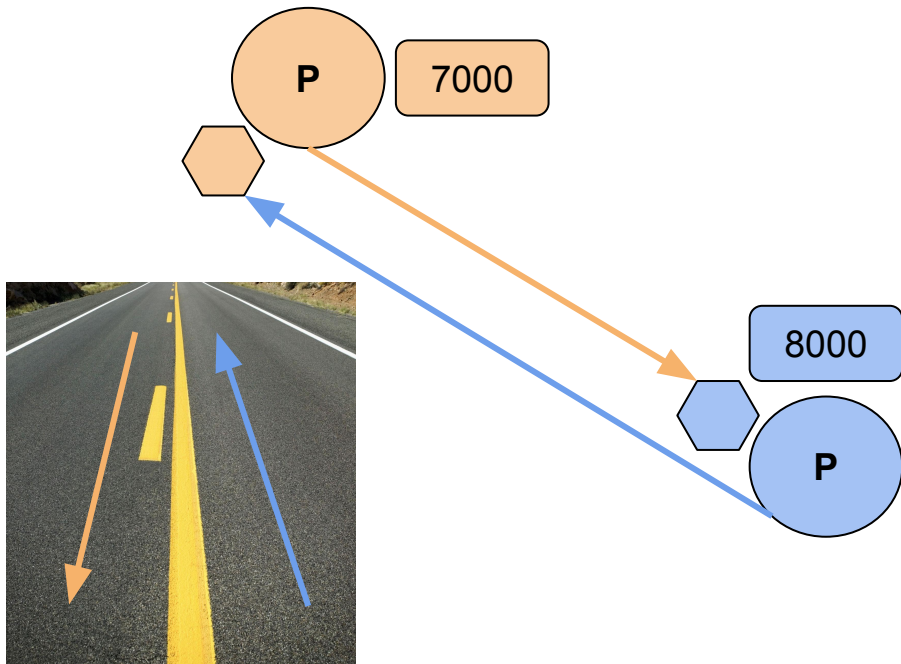


***Check out
the
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discussion!***

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P2P Communication

Remember that the OS allocates a new port for the client socket!



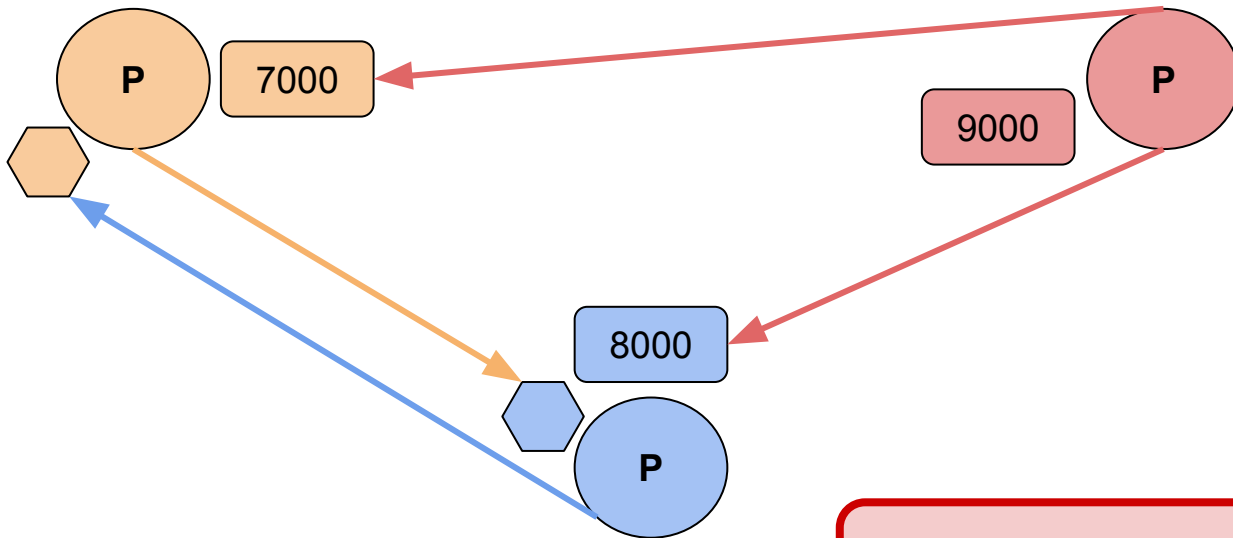
***Check out
the
recording
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discussion!***

What about Peer 9000?

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P2P Communication

Remember that the OS allocates a new port for the client socket!



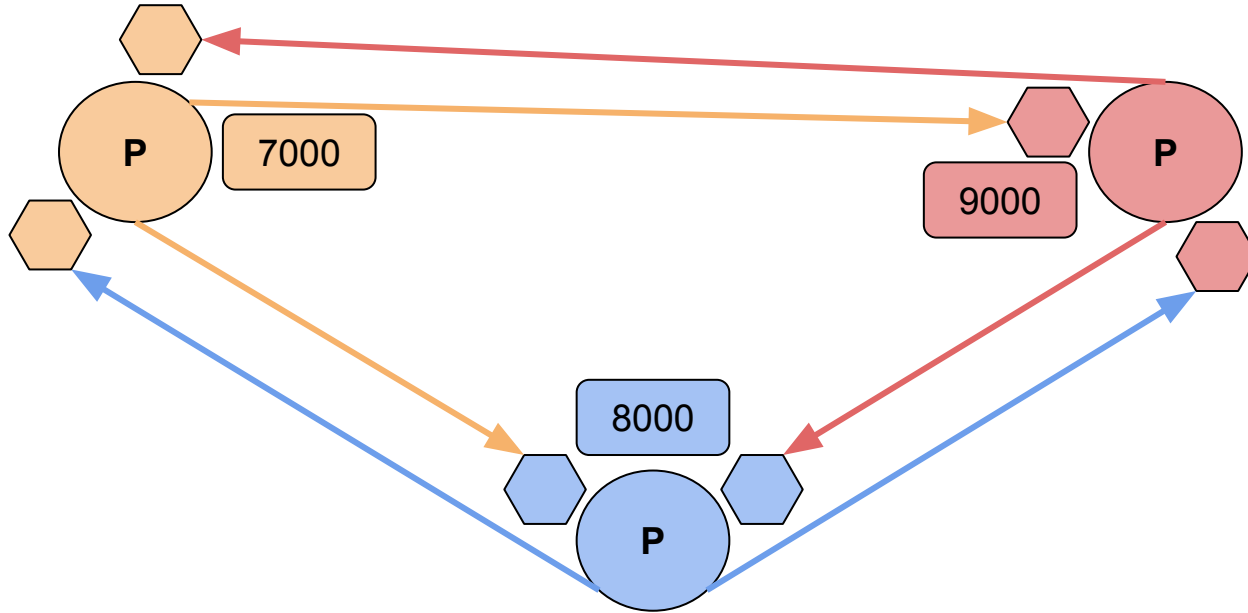
***Check out
the
recording
for the
discussion!***

What about Peer 9000?

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P2P Communication

Remember that the OS allocates a new port for the client socket!



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

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Threaded Pitfalls

Check out the recording for the solution!

Starvation

More than one thread accesses a single resource at the same time

Deadlock

A thread never gains access to the resource it needs

Race Condition

A thread is only able to acquire some of the resources it needs

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Threaded Pitfalls

What's the difference?

Starvation

vs.

Deadlock

A thread never gains access to the resource it needs

Check out the recording for the discussion!

A thread is only able to acquire some of the resources it needs

Waiting to access the **CPU**

Waiting to access another **resource**

Ready to go; never gets a chance

Not ready to go

Check out the recording for the solution!

Dining Philosophers

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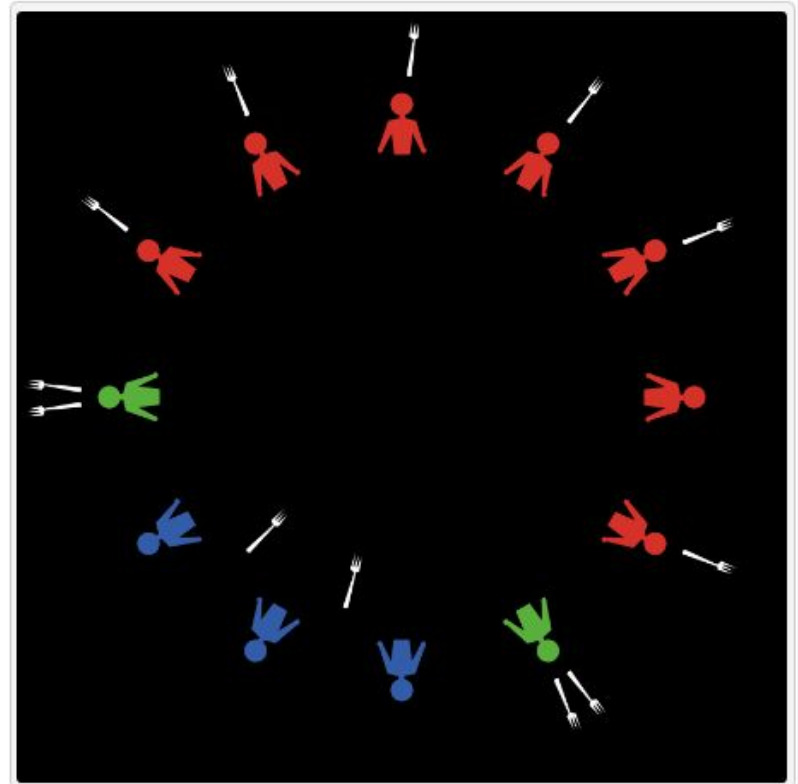
Dining Philosophers

Can we take a guess at what is happening here?

What are the **BLUE** people doing?

What are the **GREEN** people doing?

What are the **RED** people doing?



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JSON Structure

Check out the recording for the discussion!

Data is stored in...

Name:Value pairs



Members

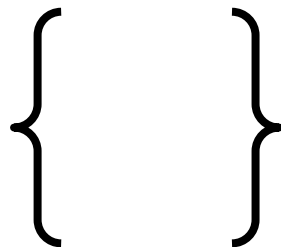
"Katie"



"student" : "Katie"

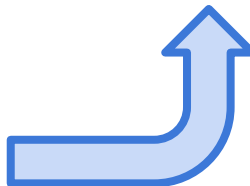
What uses curly braces?

Objects



What do Objects contain?

Members



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JSON Structure

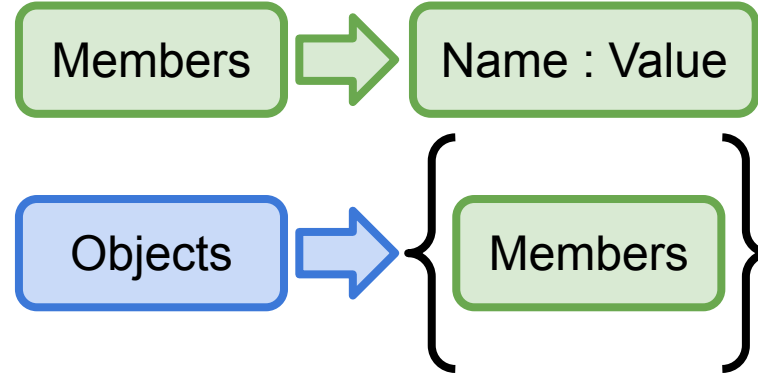
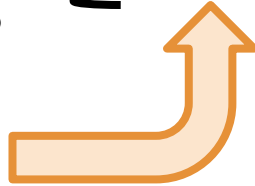
What uses brackets?

Arrays

[]

What do Arrays contain?

Any **Valid** Value



Check out the recording for the discussion!

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JSON Structure

What is a valid value?

Strings

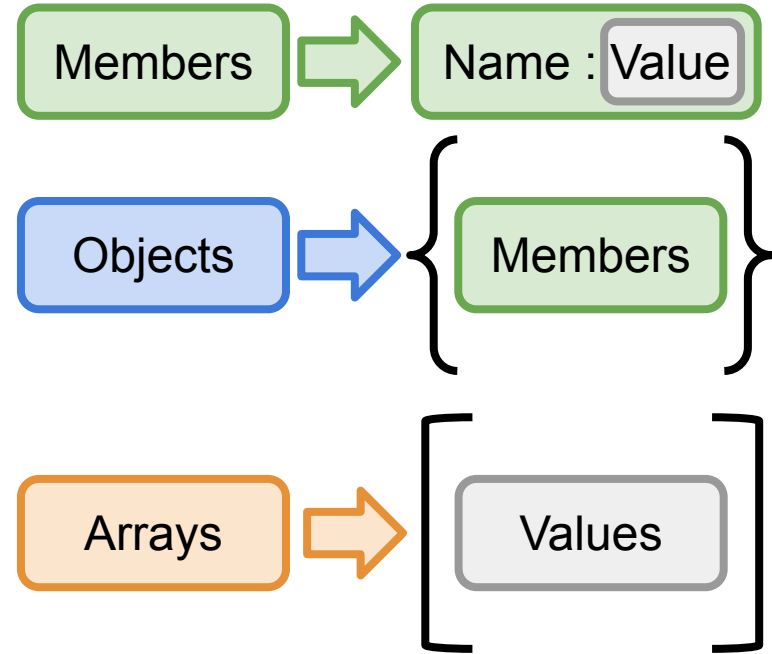
Booleans

Numbers

NULL

Objects

Arrays



Check out the recording for the discussion!

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Scratch Space

Upcoming Events

SI Sessions:

- Tuesday, April 29th, at 10:00 am MST - **Q&A Session**

Review Sessions:

- ~~• Sunday, April 27th at 6:00 pm MST - 2 hour Exam Review Session~~
- Tuesday, April 29th, 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

 **Academic Support Network**

 [Services](#)  [Faculty and Staff Resources](#) [About Us](#) 

[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 -

Apply



Academic Support Network



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Select a subject

- Any -

Apply

Business

ACC 231

Uses of Accounting Info I

 [Peer Community](#)

ACC 241

Uses of Accounting Info II

 [Peer Community](#)

CIS 105

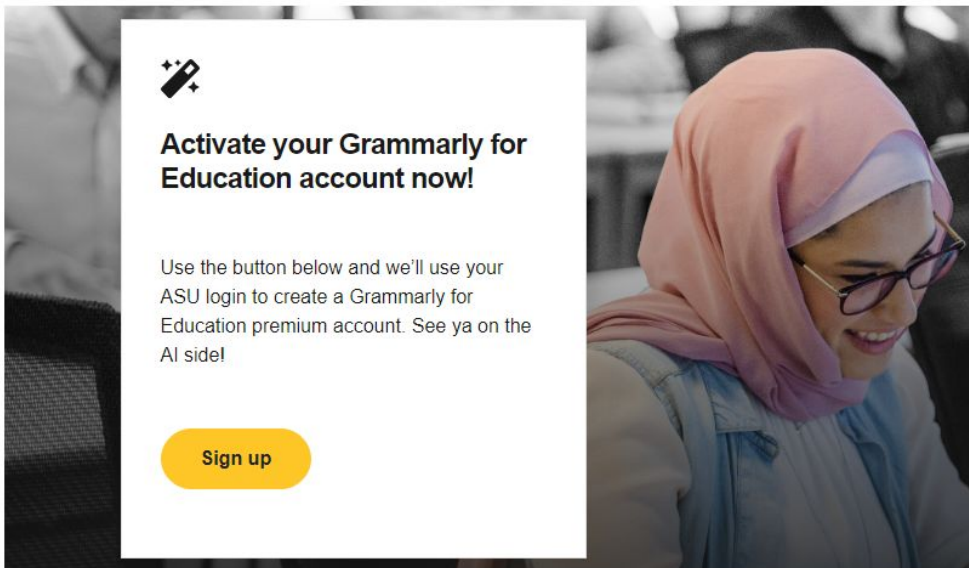
Computer Applications and Information Technology


 [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!





Activate your Grammarly for Education account now!

Use the button below and we'll use your ASU login to create a Grammarly for Education premium account. See ya on the AI side!

[Sign up](#)



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](#)