SER 321 A Session

SI Session

Sunday, February 2nd 2025

7:00 pm - 8:00 pm MST

Agenda

- OSI Review Challenge
- HTTP Review
- JSON Syntax Review & Practice
- Socket Review
  - Properties & Steps
  - Port Examination

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

Check out the recording for the solution!

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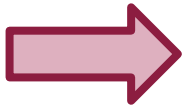
OSI Model

Unit	Layer	What we are *really* talking about
Data		
Data		
Data		
Segment		
Packet		
Frame		
Bits		



MDN HTTP Request Methods

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HTTP Requests

What are the ***FOUR*** request types we reviewed?

1.

2.

Check out the recording for the solution!

3.

4.

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HTTP Requests

MDN HTTP Request Methods

What's the difference?

1. GET
2. POST

Check out the recording for the discussion!

3. PUT
4. DELETE

Check out the recording for the solution!

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HTTP Matching

Match the HTTP response code with its meaning:

Code:	Meaning:
1XX	User Error
2XX	Server Error
3XX	Information
4XX	Redirect
5XX	Success

org.json Docs

JSON Guide

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JSON Structure

Check out the recording for the discussion!

Data is stored in…

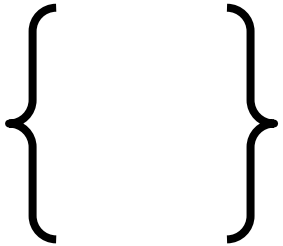
Name:Value pairs → AKA → Members

"Katie"

"student" : "Katie"

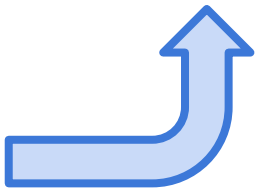
What uses curly braces?

Objects



What do Objects contain?

Members



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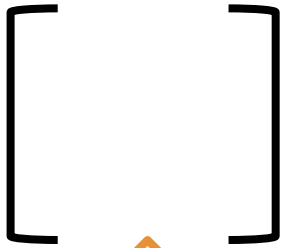
JSON Structure

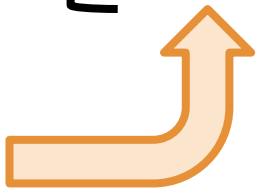
What uses brackets?

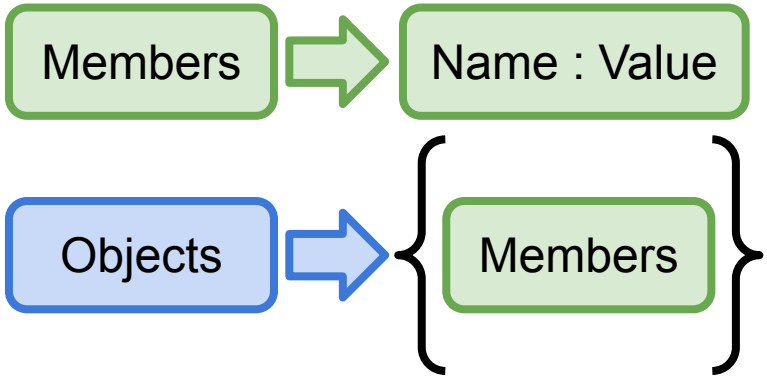
Arrays



What do Arrays contain?

Any ***Valid*** Value





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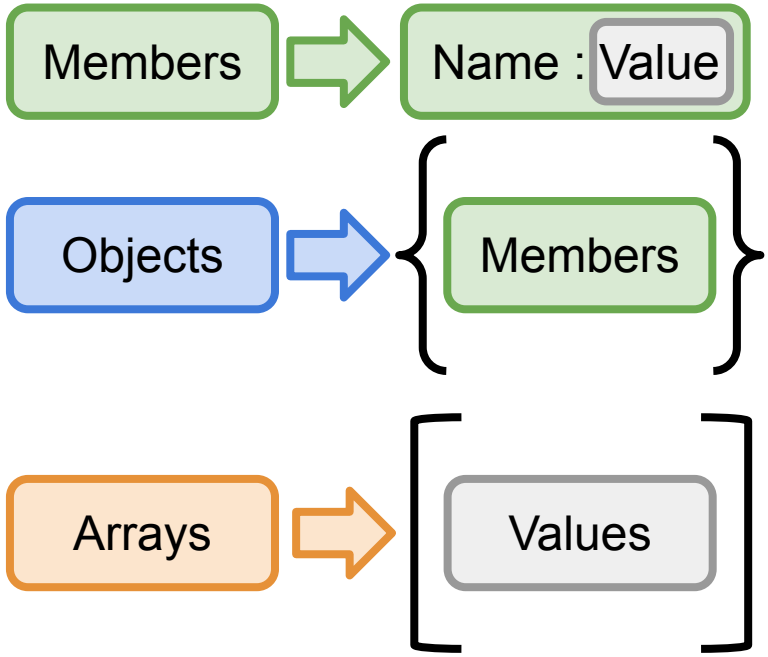
JSON Structure

What is a valid value?

- Strings
- Booleans
- Numbers
- NULL
- Objects
- Arrays



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JSON Recognition

How many Objects?

How many Arrays?

How many Members?


```
{
  "lat": 42.3434,
  "lon": -88.0412,
  "timezone": "America/Chicago",
  "timezone_offset": -21600,
  "current": {
    "dt": 1733070576,
    "sunrise": 1733058144,
    "sunset": 1733091649,
    "temp": 18.57,
    "feels_like": 5.97,
    "pressure": 1025,
    "humidity": 63,
    "dew_point": 9.21,
    "uvi": 0.79,
    "clouds": 0,
    "visibility": 10000,
    "wind_speed": 14.97,
    "wind_deg": 280,
    "wind_gust": 21.85,
    "weather": [
      {
        "id": 800,
        "main": "Clear",
        "description": "clear sky",
        "icon": "01d"
      }
    ]
  }
}
```


JSON Guide

Check out the recording for the solution!

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JSON Practice

```
JSONObject json =
```

How would we…

Check for the timezone member?

```
boolean hasTimezone =
```

Get the timezone?

```
String timezone =
```


```
{
  "lat": 42.3434,
  "lon": -88.0412,
  "timezone": "America/Chicago",
  "timezone_offset": -21600,
  "current": {
    "dt": 1733070576,
    "sunrise": 1733058144,
    "sunset": 1733091649,
    "temp": 18.57,
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      }
    ]
  }
}
```


JSON Guide

Check out the recording for the solution!

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JSON Practice

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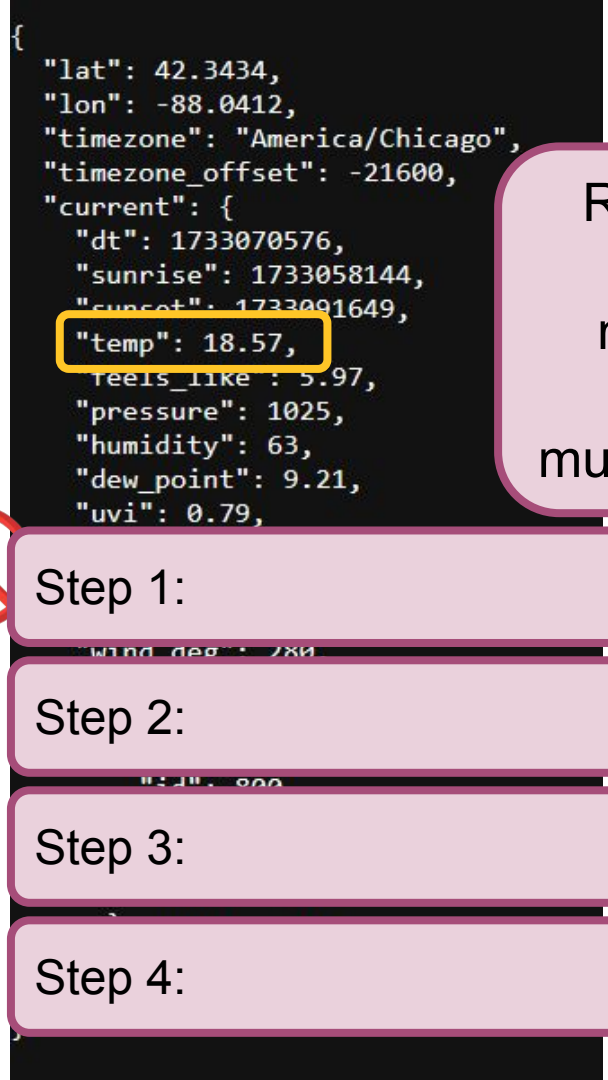
```
JSONObject json =
```

How would we…

Obtain the temp value?

~~`String temp = json.getString("temp");`~~



Recall that nested members require multiple steps!

Step 1:

Step 2:

Step 3:

Step 4:

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JSON Practice

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Check out the recording for the discussion!

```
JSONObject json =
```

How would we…

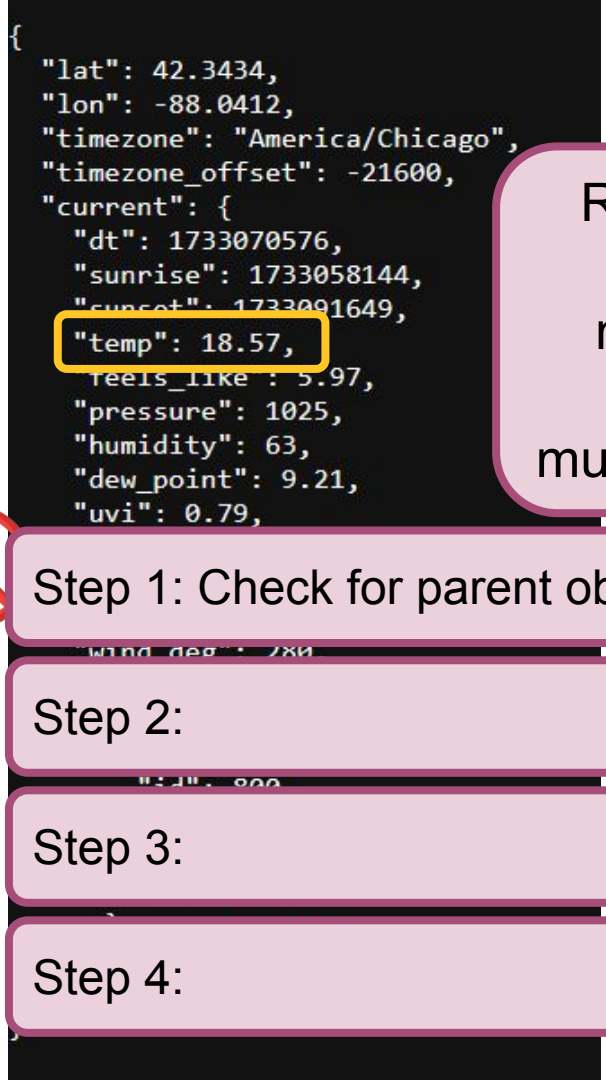
Obtain the temp value?

~~`String temp = json.getString("temp");`~~

```
if (json.has("current") {



 }
```



Recall that nested members require multiple steps!

Step 1: Check for parent object

Step 2:

Step 3:

Step 4:

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JSON Practice

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JSON Guide

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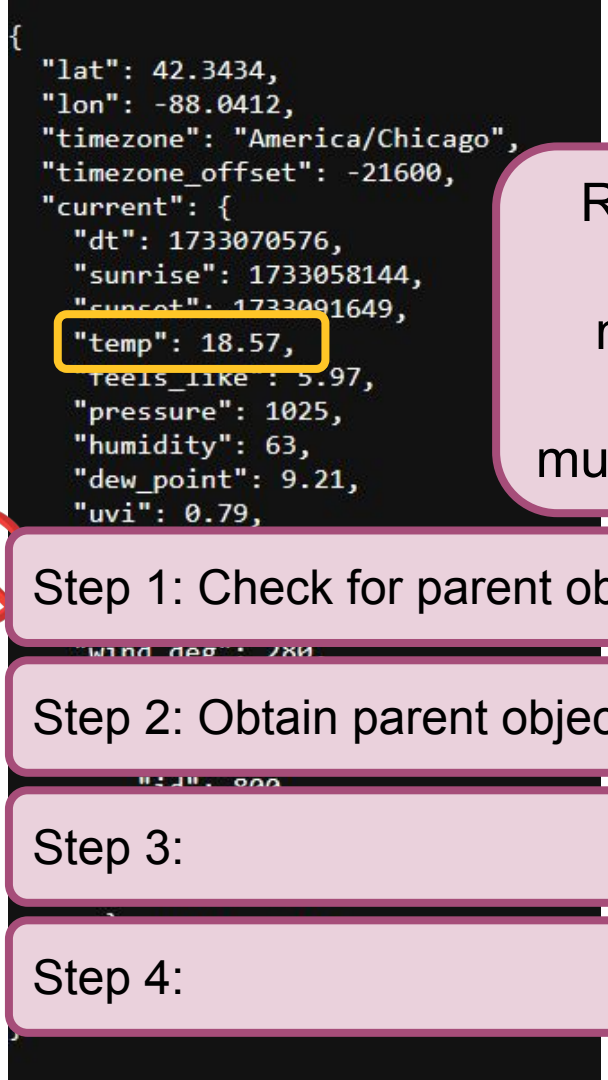
```
JSONObject json =
```



Recall that nested members require multiple steps!

How would we…

Obtain the temp value?

~~`String temp = json.getString("temp");`~~

Step 1: Check for parent object

```
if (json.has("current") {

   JSONObject current =
            json.getObject("current");



 }
```

Step 2: Obtain parent object

Step 3:

Step 4:

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JSON Practice

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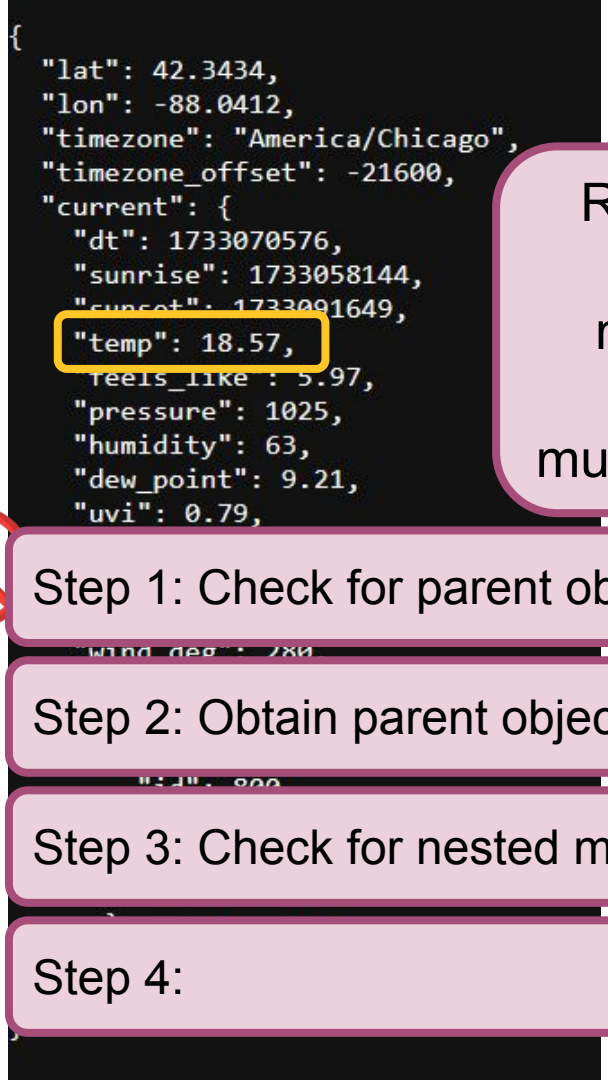
```
JSONObject json =
```



Recall that nested members require multiple steps!

How would we…

Obtain the temp value?

~~`String temp = json.getString("temp");`~~

Step 1: Check for parent object

```
if (json.has("current") {

   JSONObject current =
            json.getObject("current");
   if (current.has("temp")) {
      temp = current.getString("temp");
}
```

Step 2: Obtain parent object

Step 3: Check for nested member

Step 4:

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JSON Practice

Check out the recording for the discussion!

```
JSONObject json =
```

How would we create the "weather" object?


```
{
  "lat": 42.3434,
  "lon": -88.0412,
  "timezone": "America/Chicago",
  "timezone_offset": -21600,
  "current": {
    "dt": 1733070576,
    "sunrise": 1733058144,
    "sunset": 1733091649,
    "temp": 18.57,
    "feels_like": 5.97,
    "pressure": 1025,
    "humidity": 63,
    "dew_point": 9.21,
    "uvi": 0.79,
    "clouds": 0,
    "visibility": 10000,
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    ]
  }
}
```

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JSON Practice

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```
JSONObject json =
```

```
{
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      {
        "id": 800,
        "main": "Clear",
        "description": "clear sky",
        "icon": "01d"
      }
    ]
  }
}
```

How would we create the “weather” object?

```
JSONObject json = new JSONObject();
JSONObject weather = new JSONArray();
JSONObject content = new JSONObject();
content.put(“id”, 800);
content.put(“main”, “Clear”);
content.put(“description”, “clear sky”);
content.put(“icon”, “01d”);

weather.put(content.toMap());

json.put(weather.toMap());
```

Check out the recording for the discussion!

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Socket Properties

Sockets allow our client and server to communicate!

Need to define **3 properties** before usage

Location	IP or DNS	142.251.46.206	www.google.com
Connection Semantics	TCP or UDP	Connection Oriented	Connectionless
Message Format	Protocol Specs	Synchronous	Asynchronous
		Stateless	Stateful
		Binary	Text
		Headers	No Headers

Check out the recording for the discussion!

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Socket Properties

Sockets allow our client and server to communicate!

d to define **3 properties** before usage

- Person
- Conversation Flow
- Conversation Content

IP or DNS	142.251.46.206	www.google.com
TCP or UDP	Connection Oriented	Connectionless
Protocol Specs	Synchronous	Asynchronous
	Stateless	Stateful
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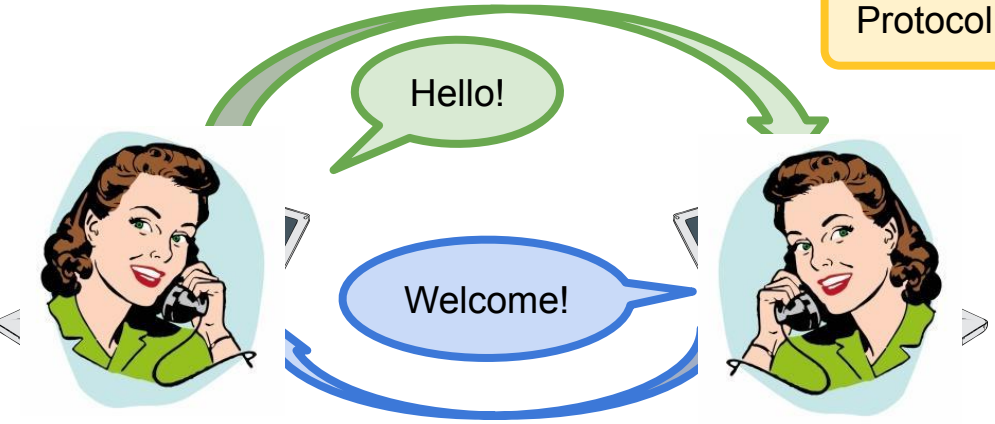

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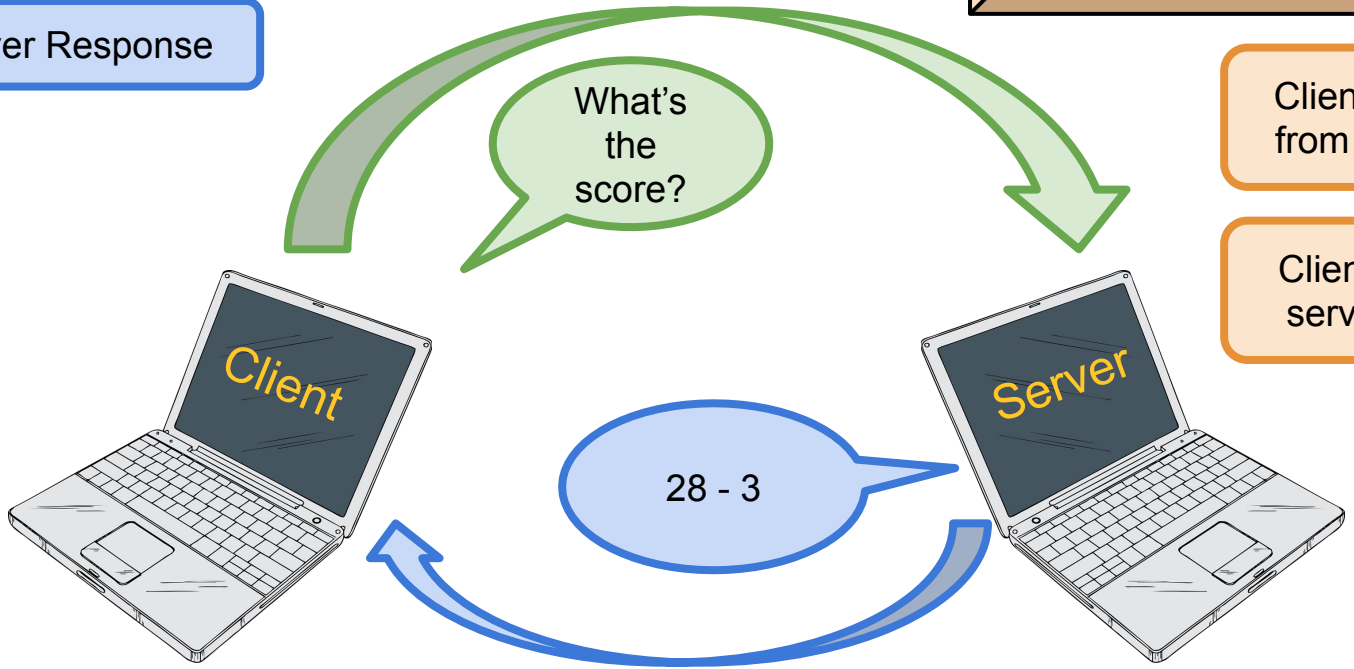
Socket Protocol Types

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

Push Model

Server *pushes* info to client

Push notifications

Check out the recording for the discussion!

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Socket Protocol Types

Two Main Conversation Models

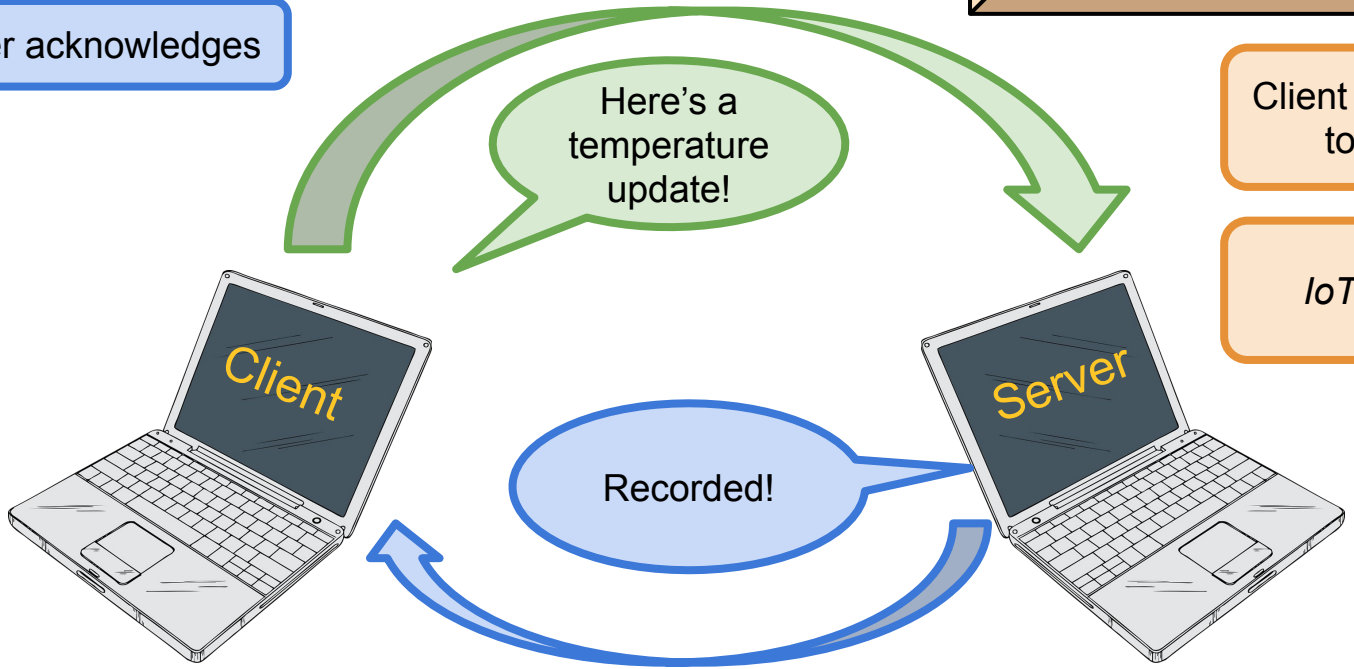
1. Client sends update

2. Server acknowledges

Client Push Model

Client *pushes* info to Server

IoT sensors



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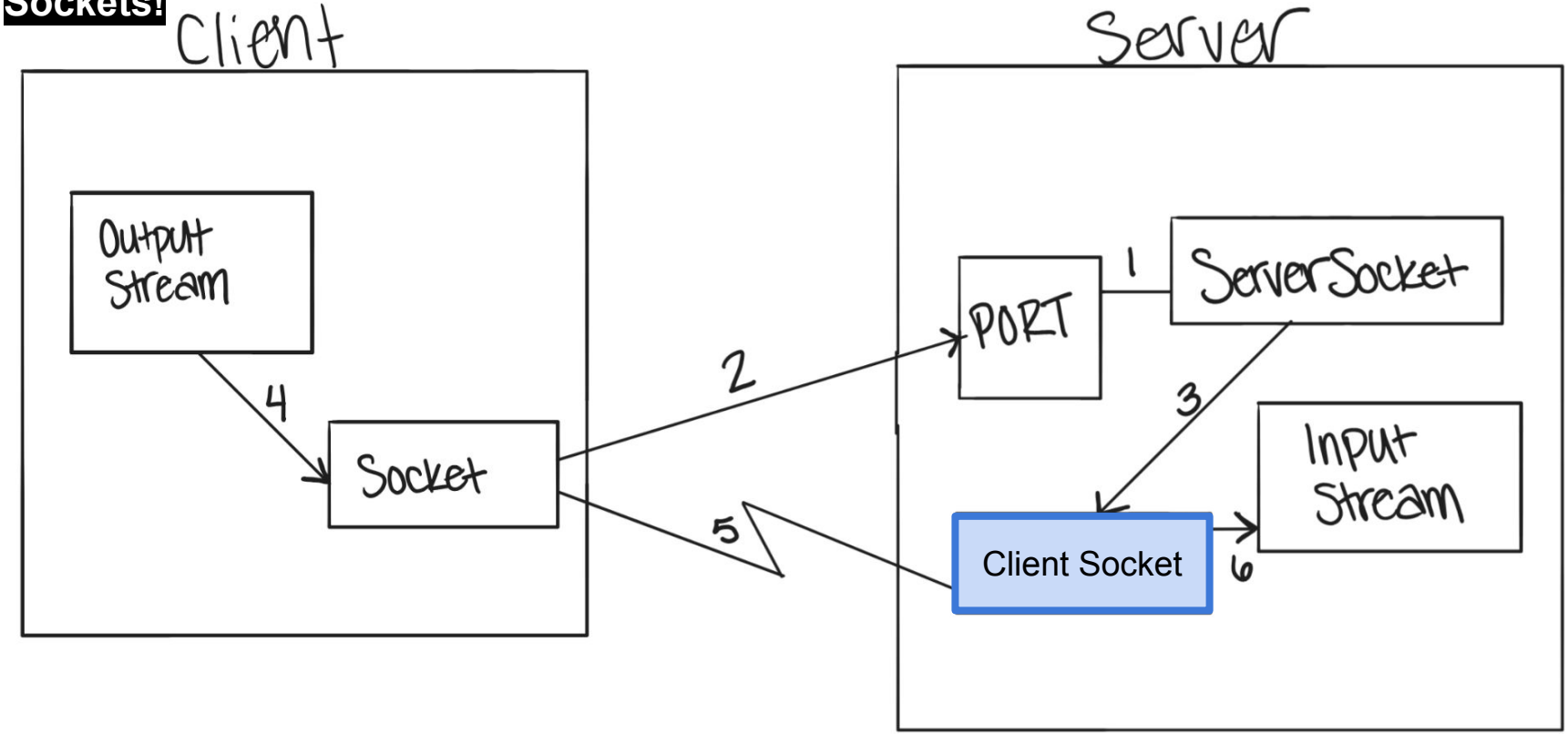
Sockets!



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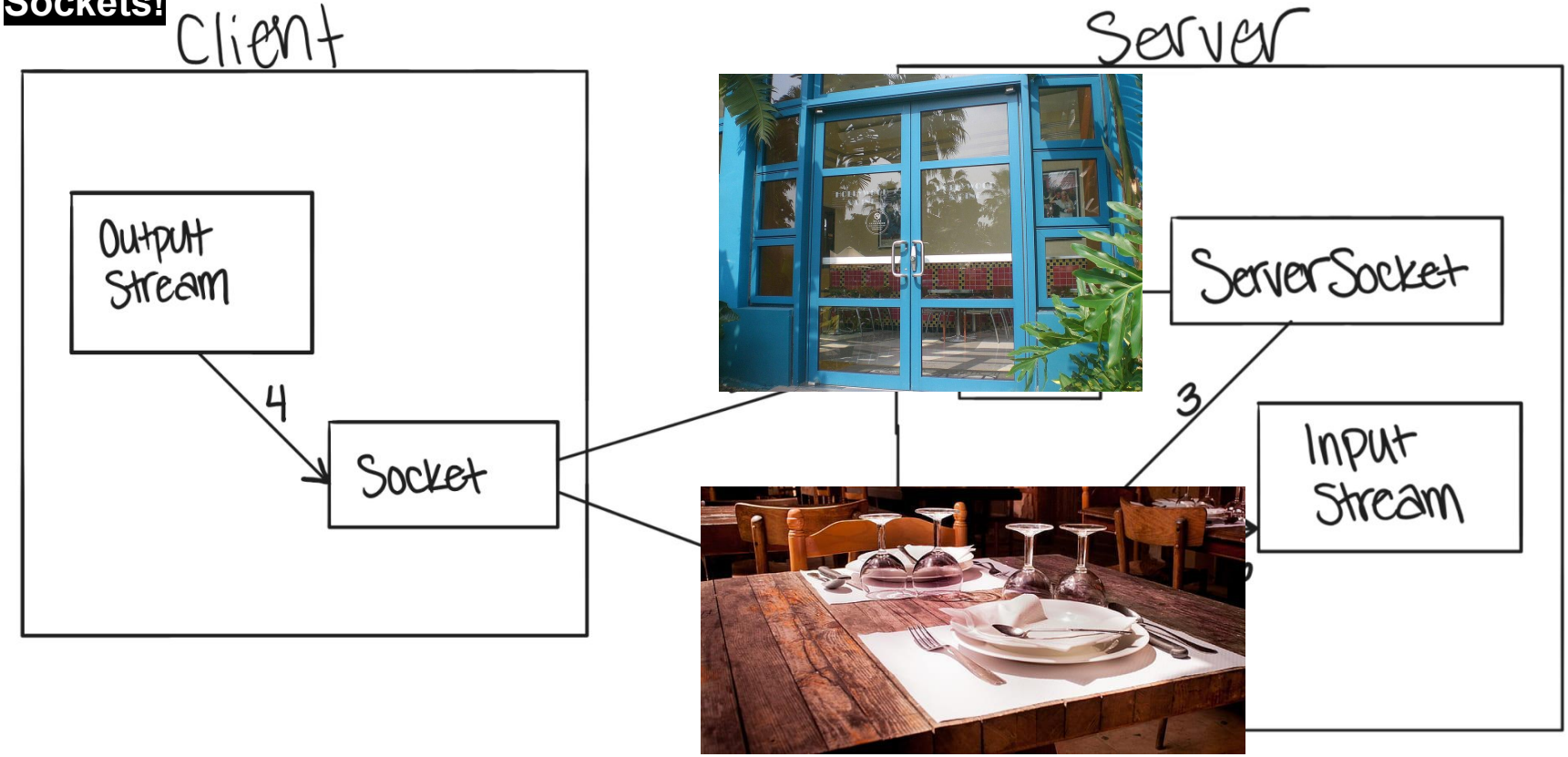
Sockets!



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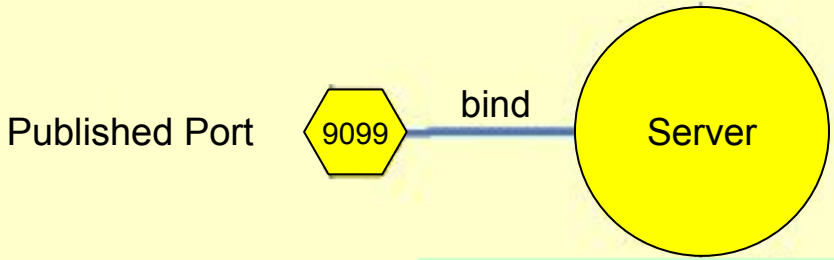
Sockets!

Check out the recording for the discussion!

```
> Task :runServer
Server ready for connections
Server is listening on port: 9099
-----
Values of the ServerSocket Object:
Inet Address: 0.0.0.0/0.0.0.0
Local Port: 9099
Server waiting for a connection
Server connected to client
-----
Values of the Client Socket Object after Connection:
        Inet Address: /127.0.0.1
        Local Address: /127.0.0.1
        Local Port: 9099
        Allocated Client Socket (Port): 60296
<==========----> 75% EXECUTING [2m 36s]
> :runServer
```




```
> Task :runClient
Connected to server at localhost:9099
Values of the Socket Object for the Server:
        Host: /127.0.0.1
        Port: 9099
        Local Port: 60296
String to send>
<==========----> 75% EXECUTING [2m 18s]s]
> :runClient
```

Design of an RFID Vehicle Authentication System: A Case Study for Al-Nahrain University Campus - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Client-and-Server-Socket-Ports_fig4_282671198

SER 321
Sockets!

```
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Server ready for connections
Server is listening on port: 9099
-----
Values of the ServerSocket Object:
Inet Address: 0.0.0.0/0.0.0.0
Local Port: 9099
Server waiting for a connection
Server connected to client
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Values of the Client Socket Object after Connection:
        Inet Address: /127.0.0.1
        Local Address: /127.0.0.1
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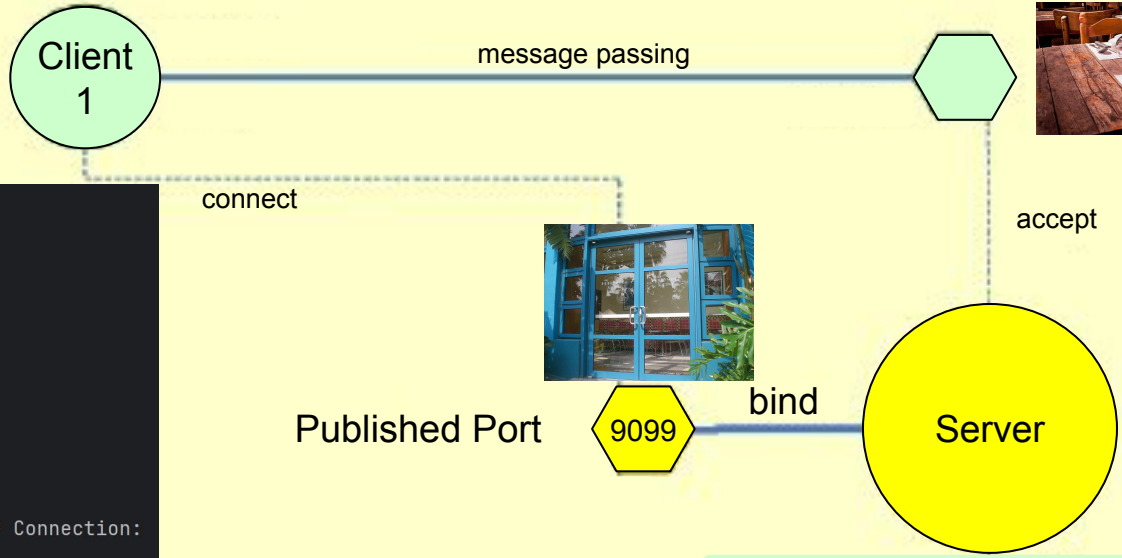


```
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Values of the Socket Object for the Server:
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String to send>
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SER 321

Scratch Space

Upcoming Events

SI Sessions:

- Tuesday, February 4th at 11:00 am MST
- Thursday, February 6th at 7:00 pm MST
- Sunday, February 9th at 7:00 pm MST

Review Sessions:

- Tuesday, February 25th at 11:00 am MST - **Q&A Session**
- Thursday, February 27th at 7:00 pm MST - **Exam Review Session (2hrs)**

Questions?

Survey:

https://asuasn.info/ASNSurvey

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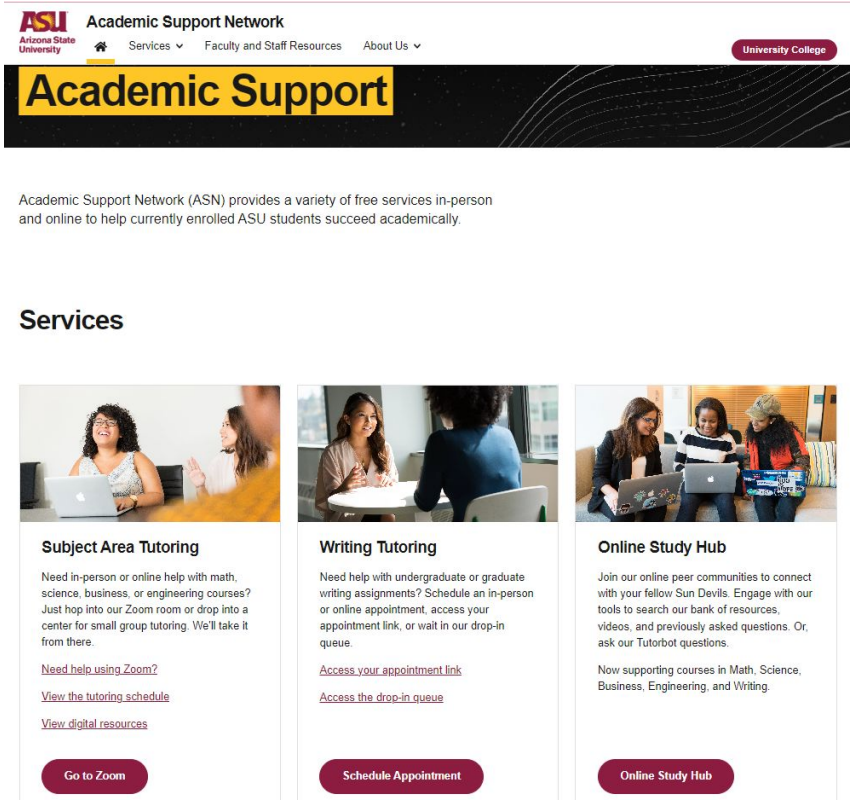
More Questions?

Check out our other resources!

tutoring.asu.edu

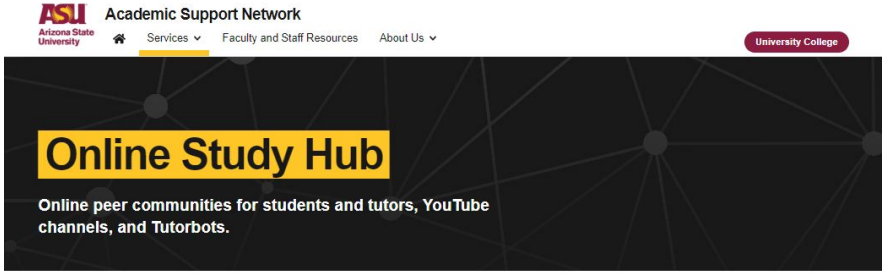


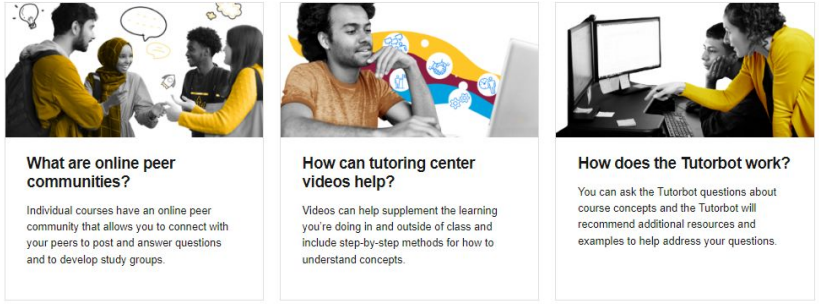
1. **Click on ‘Go to Zoom’ to log onto our Online Tutoring Center.**
2. **Click on ‘View the tutoring schedule’ to see when tutors are available for specific courses.**

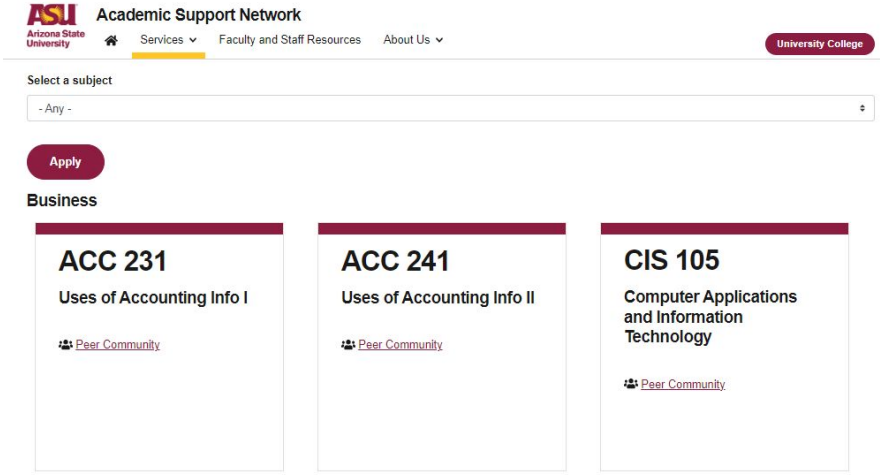
More Questions?

Check out our other resources!

tutoring.asu.edu/online-study-hub



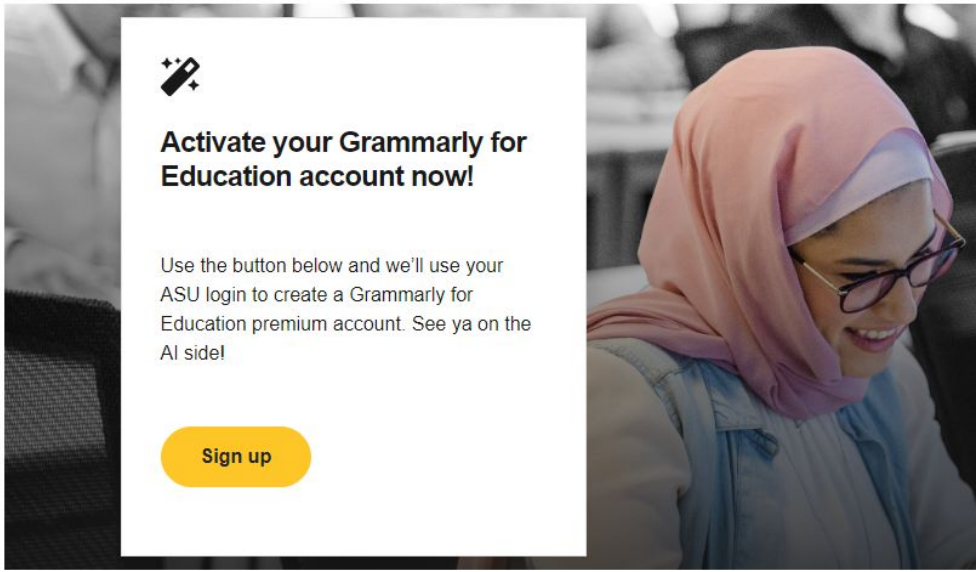




Don't forget to check out the Online Study Hub for additional resources!

Expanded Writing Support Available

Including Grammarly for Education, at no cost!



tutoring.asu.edu/expanded-writing-support

*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