

# SER 321 A Session

**SI Session**

**Sunday, January 26th 2025**

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

# Agenda



Assignment 3-2 GUI Walkthrough

JSON Hands-on Practice (Part 2)

Client & Server Identification

Robustness & Error Handling

# 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

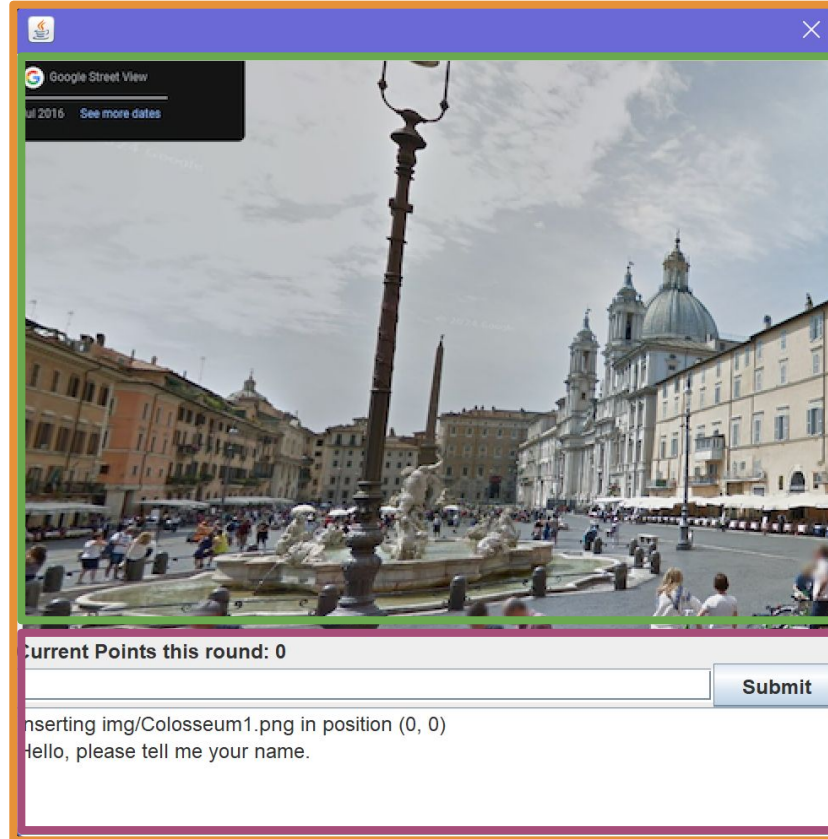
- Use the chat feature to interact with the presenter and respond to presenter's questions.
- Annotations are encouraged

**SER 321**

**Assignment 3-2 GUI**

# ☀ GUI Walkthrough ☀

Frame



picPanel

outputPanel

**SER 321**

**Assignment 3-2 GUI**

## ClientGui Points of Interest!

Line	Item
58	Constructor
86	Calling newGame()
114	show()
125	newGame()
139	insertImage()
(154)	appendOutput()
165	submitClicked()

# SER 321

## JSON Practice

JSONObject json =

How would we...

Check for the name member?

boolean hasName =

Get the project name?

String name =

```
{
  "name": "lab3vue_act3_kgrinne3",
  "version": "0.0.0",
  "private": true,
  "scripts": {
    "dev": "vite",
    "build": "vite build",
    "preview": "vite preview"
  },
  "dependencies": {
    "vue": "^3.3.4"
  },
  "devDependencies": {
    "@vitejs/plugin-vue": "^4.3.1",
    "vite": "^4.4.9"
  }
}
```

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**JSON Practice**

[org.json Docs](#)

[JSON Guide](#)

JSONObject json =

How would we...

Get the dev value?

JSONObject scripts =

String dev=

```
{
  "name": "lab3vue_act3_kgrinne3",
  "version": "0.0.0",
  "private": true,
  "scripts": {
    "dev": "vite",
    "build": "vite build",
    "preview": "vite preview"
  },
  "dependencies": {
    "vue": "^3.3.4"
  },
  "devDependencies": {
    "@vitejs/plugin-vue": "^4.3.1",
    "vite": "^4.4.9"
  }
}
```

Step 1:  
Get the scripts  
Object

Step 2:  
Get the dev  
value



# SER 321

## JSON Practice

JSONObject json =

How would we...

Build the json object?

You *could* do it all inline,  
but let's go one object at  
a time for clarity

```
{
  "name": "lab3vue_act3_kgrinne3",
  "version": "0.0.0",
  "private": true,
  "scripts": {
    "dev": "vite",
    "build": "vite build",
    "preview": "vite preview"
  },
  "dependencies": {
    "vue": "^3.3.4"
  },
  "devDependencies": {
    "@vitejs/plugin-vue": "^4.3.1",
    "vite": "^4.4.9"
  }
}
```

# SER 321

## JSON Practice

JSONObject json =

{

[JSON Guide](#)

```
"name": "lab3vue_act3_kgrinne3",  
"version": "0.0.0",  
"private": true,  
"scripts": {  
  "dev": "vite",  
  "build": "vite build",  
  "preview": "vite preview"  
},  
"dependencies": {  
  "vue": "^3.3.4"  
},  
"devDependencies": {  
  "@vitejs/plugin-vue": "^4.3.1",  
  "vite": "^4.4.9"  
}  
}
```

## SER 321

### JSON Practice

```
JSONObject json = new JSONObject();  
json.put("name", "lab3vue_act3_kgrinne3");  
json.put("version", "0.0.0");  
json.put("private", true);
```

```
{  
  "name": "lab3vue_act3_kgrinne3",  
  "version": "0.0.0",  
  "private": true,  
  "scripts": {  
    "dev": "vite",  
    "build": "vite build",  
    "preview": "vite preview"  
  },  
  "dependencies": {  
    "vue": "^3.3.4"  
  },  
  "devDependencies": {  
    "@vitejs/plugin-vue": "^4.3.1",  
    "vite": "^4.4.9"  
  }  
}
```

# SER 321

## JSON Practice

JSONObject scripts =

```
{
  "name": "lab3vue_act3_kgrinne3",
  "version": "0.0.0",
  "private": true,
  "scripts": {
    "dev": "vite",
    "build": "vite build",
    "preview": "vite preview"
  },
  "dependencies": {
    "vue": "^3.3.4"
  },
  "devDependencies": {
    "@vitejs/plugin-vue": "^4.3.1",
    "vite": "^4.4.9"
  }
}
```

## SER 321

### JSON Practice

```
JSONObject scripts = new JSONObject();
scripts.put("dev", "vite");
scripts.put("build", "vite build");
scripts.put("preview", "vite preview");
json.put("scripts", scripts.toMap());
```

```
{
  "name": "lab3vue_act3_kgrinne3",
  "version": "0.0.0",
  "private": true,
  "scripts": {
    "dev": "vite",
    "build": "vite build",
    "preview": "vite preview"
  },
  "dependencies": {
    "vue": "^3.3.4"
  },
  "devDependencies": {
    "@vitejs/plugin-vue": "^4.3.1",
    "vite": "^4.4.9"
  }
}
```

# SER 321

## JSON Practice

JSONObject depend =

```
{
  "name": "lab3vue_act3_kgrinne3",
  "version": "0.0.0",
  "private": true,
  "scripts": {
    "dev": "vite",
    "build": "vite build",
    "preview": "vite preview"
  },
  "dependencies": {
    "vue": "^3.3.4"
  },
  "devDependencies": {
    "@vitejs/plugin-vue": "^4.3.1",
    "vite": "^4.4.9"
  }
}
```

## SER 321

### JSON Practice

```
JSONObject depend = new JSONObject();  
depend.put("vue", "^3.3.4");  
json.put("dependencies", depend.toMap());
```

```
{  
  "name": "lab3vue_act3_kgrinne3",  
  "version": "0.0.0",  
  "private": true,  
  "scripts": {  
    "dev": "vite",  
    "build": "vite build",  
    "preview": "vite preview"  
  },  
  "dependencies": {  
    "vue": "^3.3.4"  
  },  
  "devDependencies": {  
    "@vitejs/plugin-vue": "^4.3.1",  
    "vite": "^4.4.9"  
  }  
}
```

# SER 321

## JSON Practice

JSONObject devDep =

[JSON Guide](#)

```
{
  "name": "lab3vue_act3_kgrinne3",
  "version": "0.0.0",
  "private": true,
  "scripts": {
    "dev": "vite",
    "build": "vite build",
    "preview": "vite preview"
  },
  "dependencies": {
    "vue": "^3.3.4"
  },
  "devDependencies": {
    "@vitejs/plugin-vue": "^4.3.1",
    "vite": "^4.4.9"
  }
}
```



# SER 321

## JSON Practice

```
JSONObject devDep = new JSONObject();  
devDep.put("@vitejs/plugin-vue", "^4.3.1");  
devDep.put("vite", "^4.4.9");  
json.put("devDependencies", devDep.toMap());
```

```
{  
  "name": "lab3vue_act3_kgrinne3",  
  "version": "0.0.0",  
  "private": true,  
  "scripts": {  
    "dev": "vite",  
    "build": "vite build",  
    "preview": "vite preview"  
  },  
  "dependencies": {  
    "vue": "^3.3.4"  
  },  
  "devDependencies": {  
    "@vitejs/plugin-vue": "^4.3.1",  
    "vite": "^4.4.9"  
  }  
}
```

**SER 321**  
**Client/Server**

## Think Fast - Client or Server?

```
String host = args[0];  
Socket server = new Socket(host, port);  
System.out.println("Connected to server at " + host + ":" + port);
```

**SER 321**  
**Client/Server**

## Think Fast - Client or Server?

```
Socket clientSock;  
ServerSocket sock = new ServerSocket(port);  
System.out.println("Server ready for connections");
```

How are we feeling about Client/Server communications so far?

## Think Fast - Client or Server?

```
try {
    sock = new Socket(host, port: 8888);
    OutputStream out = sock.getOutputStream();
    ObjectOutputStream os = new ObjectOutputStream(out);
    os.writeObject(message);
    os.writeObject(number);
    os.flush();

    ObjectInputStream in = new ObjectInputStream(sock.getInputStream());
    String i = (String) in.readObject();
    System.out.println(i);
    sock.close();
} catch (Exception e) {e.printStackTrace();}
```

**SER 321****Client/Server**

## Think Fast - Client or Server?

```
try {
    ServerSocket serv = new ServerSocket(port: 8888);
    for (int rep = 0; rep < 3; rep++){
        sock = serv.accept();
        ObjectInputStream in = new ObjectInputStream(sock.getInputStream());

        String s = (String) in.readObject();
        System.out.println("Received the String "+s);
        Integer i = (Integer) in.readObject();
        System.out.println("Received the Integer "+ i);

        OutputStream out = sock.getOutputStream();
        ObjectOutputStream os = new ObjectOutputStream(out);
        os.writeObject("Got it!");
        os.flush();
    }
} catch (Exception e) {e.printStackTrace();}
```

**SER 321**

**Making your Code Robust**

What do we mean when we say “make sure your code is robust”?

*Error  
Handling*

# SER 321

## Making your Code Robust

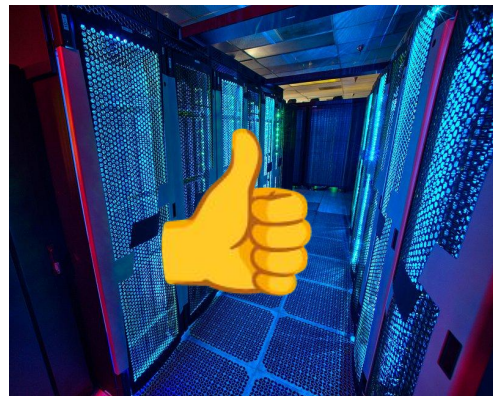
What do we mean when we say “make sure your code is robust”?



You



Buddy



# SER 321

## Making your Code Robust

What do we mean when we say “make sure your code is robust”?

```
PS C:\ASU\SER321\examples_repo\ser321examples\Sockets\Echo_Java> gradle runServer
```

```
> Task :runServer
```

```
Server ready for connections
```

```
Server waiting for a connection
```

```
Server connected to client
```

```
<=====--> 75% EXECUTING [24m 44s]
```

```
> :runServer
```



```
PS C:\ASU\SER321\examples_repo\ser321examples> gradle runClient
Starting a Gradle Daemon, 1 busy and 3 stopped
```

```
> Task :runClient
```

```
Connected to server at localhost:9099
```

```
String to send>
```

```
<=====--> 75% EXECUTING [24m 25s]
```

```
> :runClient
```



What do you think will happen?



# SER 321

## Making your Code Robust

We crashed the server!

```
PS C:\ASU\SER321\examples_repo\ser321examples\Sockets\Echo_Java> gradle run
```



```
Server ready for connections
Server waiting for a connection
Server connected to client
java.net.SocketException: Connection reset
    at java.base/sun.nio.ch.NioSocketImpl.implRead(NioSocketImpl.java:320)
    at java.base/sun.nio.ch.NioSocketImpl.read(NioSocketImpl.java:347)
    at java.base/sun.nio.ch.NioSocketImpl$1.read(NioSocketImpl.java:800)
    at java.base/java.net.Socket$SocketInputStream.read(Socket.java:966)
    at Server.main(Server.java:48)
```

```
Deprecated Gradle features were used in this build, making it incompatible with
Gradle 8.0.
```

```
PS C:\ASU\SER321\examples_repo\ser321examples\Sockets\Echo_Java> gradle run
Starting a Gradle Daemon, 1 busy and 3 stopped Daemons could not be
```

```
PS C:\ASU\SER321\examples_repo\ser321examples\Sockets\Echo_Java> gradle runClient
Starting a Gradle Daemon, 1 busy and 3 stopped Daemons could not be
se --status for details

> Task :runClient
Connected to server at localhost:9099
String to send>
<=====--> 75% EXECUTING [24m 43s]
> :runClient
Terminate batch job (Y/N)? y
PS C:\ASU\SER321\examples_repo\ser321examples\Sockets\Echo_Java>
```

## SER 321

### Making your Code Robust

# What happened?

```
while(true) {  
    System.out.println("Server waiting for a connection");  
    clientSock = sock.accept(); // blocking wait  
    PrintWriter out = new PrintWriter(clientSock.getOutputStream(), autoFlush: true);  
    InputStream input = clientSock.getInputStream();  
    System.out.println("Server connected to client");  
    int numr = input.read(clientInput, off: 0, buflen);  
    while (numr != -1) {  
        String received = new String(clientInput, offset: 0, numr);  
        System.out.println("read from client: " + received);  
        out.println(received);  
        numr = input.read(clientInput, off: 0, buflen);  
    }  
    input.close();  
    clientSock.close();  
    System.out.println("Socket Closed.");  
}
```

We saw this...

Then got a  
SocketException  
stacktrace...

# SER 321

## Making your Code Robust

We just threw the error to the console and quit!



```
try {
    if (args.length != 1) {...}
    int port = -1;
    try {...} catch (NumberFormatException nfe) {...}
    Socket clientSock;
    ServerSocket sock = new ServerSocket(port);
    System.out.println("Server ready for connections");

    int bufLen = 1024;
    byte clientInput[] = new byte[bufLen]; // up to 1024 bytes in a message.
    while(true) {
        System.out.println("Server waiting for a connection");
        clientSock = sock.accept(); // blocking wait
        PrintWriter out = new PrintWriter(clientSock.getOutputStream(), autoFlush: true);
        InputStream input = clientSock.getInputStream();
        System.out.println("Server connected to client");
        int numr = input.read(clientInput, off: 0, bufLen);
        while (numr != -1) {
            String received = new String(clientInput, offset: 0, numr);
            System.out.println("read from client: " + received);
            out.println(received);
            numr = input.read(clientInput, off: 0, bufLen);
        }
        input.close();
        clientSock.close();
        System.out.println("Socket Closed.");
    }
} catch (Exception e) {
    e.printStackTrace();
}
```

### Sockets/Echo Java

# SER 321

## Making your Code Robust

What can we do to keep our server from crashing?



```
try {
    if (args.length != 1) {...}
    int port = -1;
    try {...} catch (NumberFormatException nfe) {...}
    Socket clientSock;
    ServerSocket sock = new ServerSocket(port);
    System.out.println("Server ready for connections");

    int bufLen = 1024;
    byte clientInput[] = new byte[bufLen]; // up to 1024 bytes in a message.
    while(true) {
        System.out.println("Server waiting for a connection");
        clientSock = sock.accept(); // blocking wait
        PrintWriter out = new PrintWriter(clientSock.getOutputStream(), autoFlush: true);
        InputStream input = clientSock.getInputStream();
        System.out.println("Server connected to client");
        int numr = input.read(clientInput, off: 0, bufLen);
        while (numr != -1) {
            String received = new String(clientInput, offset: 0, numr);
            System.out.println("read from client: " + received);
            out.println(received);
            numr = input.read(clientInput, off: 0, bufLen);
        }
        input.close();
        clientSock.close();
        System.out.println("Socket Closed.");
    }
} catch (Exception e) {
    e.printStackTrace();
}
```

Sockets/Echo Java

# SER 321

## Making your Code Robust

```
while(true) {  
    System.out.println("Server waiting for a connection");  
    clientSock = sock.accept(); // blocking wait  
    PrintWriter out = new PrintWriter(clientSock.getOutputStream(), autoFlush: true);  
    InputStream input = clientSock.getInputStream();  
    System.out.println("Server connected to client");  
    int numr = input.read(clientInput, off: 0, bufLen);  
    while (numr != -1) {  
        String received = new String(clientInput, offset: 0, numr);  
        System.out.println("read from client: " + received);  
        out.println(received);  
        numr = input.read(clientInput, off: 0, bufLen);  
    }  
    input.close();  
    clientSock.close();  
    System.out.println("Socket Closed.");  
}
```

# SER 321

## Making your Code Robust

```
while (true) {
    System.out.println("Server waiting for a connection");
    clientSock = sock.accept(); // blocking wait
    PrintWriter out = new PrintWriter(clientSock.getOutputStream(), autoFlush: true);
    InputStream input = clientSock.getInputStream();
    System.out.println("Server connected to client");
    int numr = -1;
    try {
        numr = input.read(clientInput, off: 0, bufLen);
    } catch (SocketException e) {
        System.out.println("Client disconnected.");
        break;
    }

    while (numr != -1) {
        String received = new String(clientInput, offset: 0, numr);
        System.out.println("read from client: " + received);
        out.println(received);
        numr = input.read(clientInput, off: 0, bufLen);
    }
    input.close();
    clientSock.close();
    System.out.println("Socket Closed.");
}
```



# SER 321

## Making your Code Robust

What other things  
can we do to keep  
our server running?

Error Handling!

```
while (true) {  
    System.out.println("Server waiting for a connection");  
    clientSock = sock.accept(); // blocking wait  
    PrintWriter out = new PrintWriter(clientSock.getOutputStream(), autoFlush: true);  
    InputStream input = clientSock.getInputStream();  
    System.out.println("Server connected to client");  
    int numr = -1;  
    try {  
        numr = input.read(clientInput, off: 0, bufLen);  
    } catch (SocketException e) {  
        System.out.println("Client disconnected.");  
        break;  
    }  
}
```

Sockets/SimpleProtocolWithSomeErrorHandling

```
while (numr != -1) {  
    String received = new String(clientInput, offset: 0, numr);  
    System.out.println("read from client: " + received);  
    out.println(received);  
    numr = input.read(clientInput, off: 0, bufLen);  
}  
input.close();  
clientSock.close();  
System.out.println("Socket Closed.");  
}
```

# SER 321

## Making your Code Robust

```
static JSONObject testField(JSONObject req, String key, String type){
    JSONObject res = new JSONObject();
    // field does not exist
    if (!req.has(key)){
        res.put("ok", false);
        res.put("message", "Field " + key +
            " does not exist in request");
        return res;
    }
    System.out.println(req.get(key).getClass().getName());
    // field does not have correct type
    if (!req.get(key).getClass().getName().equals(type)){
        res.put("message", "Field " + key +
            " needs to be of type: " + type);
        res.put("ok", false);
        return res.put("ok", false);
    } else {
        return res.put("ok", true);
    }
}
```

```
while (true){
    System.out.println("Server waiting for a connection");
    sock = serv.accept(); // blocking wait
    in = new ObjectInputStream(sock.getInputStream());
    OutputStream out = sock.getOutputStream();
    os = new DataOutputStream(out);
    String s = (String) in.readObject();
    JSONObject req = new JSONObject(s);

    JSONObject res =
        testField(req, key: "type", type: "java.lang.String");
    if (!res.getBoolean(key: "ok")) {
        overandout(res);
        continue;
    }

    // check which request it is (could also be a switch statement)
    if (req.getString(key: "type").equals("echo")) {
        res = echo(req);
    } else if (req.getString(key: "type").equals("add")) {
        res = add(req);
    } else if (req.getString(key: "type").equals("addmany")) {
        res = addmany(req);
    } else {
        res = wrongType(req);
    }
    overandout(res);
}
```



## SER 321

### Making your Code Robust

```
static JSONObject testField(JSONObject req, String key, String type){
    JSONObject res = new JSONObject();
    // field does not exist
    if (!req.has(key)){
        res.put("ok", false);
        res.put("message", "Field " + key +
            " does not exist in request");
        return res;
    }
    System.out.println(req.get(key).getClass().getName());
    // field does not have correct type
    if (!req.get(key).getClass().getName().equals(type)){
        res.put("message", "Field " + key +
            " needs to be of type: " + type);
        res.put("ok", false);
        return res.put("ok", false);
    } else {
        return res.put("ok", true);
    }
}
```

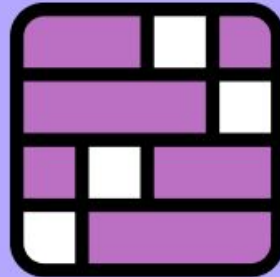
```
static JSONObject wrongType(JSONObject req){ 1 usage
    JSONObject res = new JSONObject();
    res.put("ok", false);
    res.put("message", "Type " + req.getString("key: "type") + " not supported.");
    return res;
}
```

```
while (true){
    System.out.println("Server waiting for a connection");
    sock = serv.accept(); // blocking wait
    in = new ObjectInputStream(sock.getInputStream());
    OutputStream out = sock.getOutputStream();
    os = new DataOutputStream(out);
    String s = (String) in.readObject();
```

```
// check which request it is (could also be a switch statement)
if (req.getString("key: "type").equals("echo")) {
    res = echo(req);
} else if (req.getString("key: "type").equals("add")) {
    res = add(req);
} else if (req.getString("key: "type").equals("addmany")) {
    res = addmany(req);
} else {
    res = wrongType(req);
}
overandout(res);
}
```

Connections!

The New York Times **Games**



**Connections**

**SER 321**

**Scratch Space**

## Upcoming Events

### SI Sessions:

- Tuesday, January 28th at 11:00 am MST
- Thursday, January 30th at 7:00 pm MST
- Sunday, February 2nd at 7:00 pm MST

### Review Sessions:

- TBD

# 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**  
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



Services

Faculty and Staff Resources

About Us

University College

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- Any -

Apply

Business

### ACC 231

Uses of Accounting Info I

Peer Community

### ACC 241

Uses of Accounting Info II

Peer Community

### CIS 105

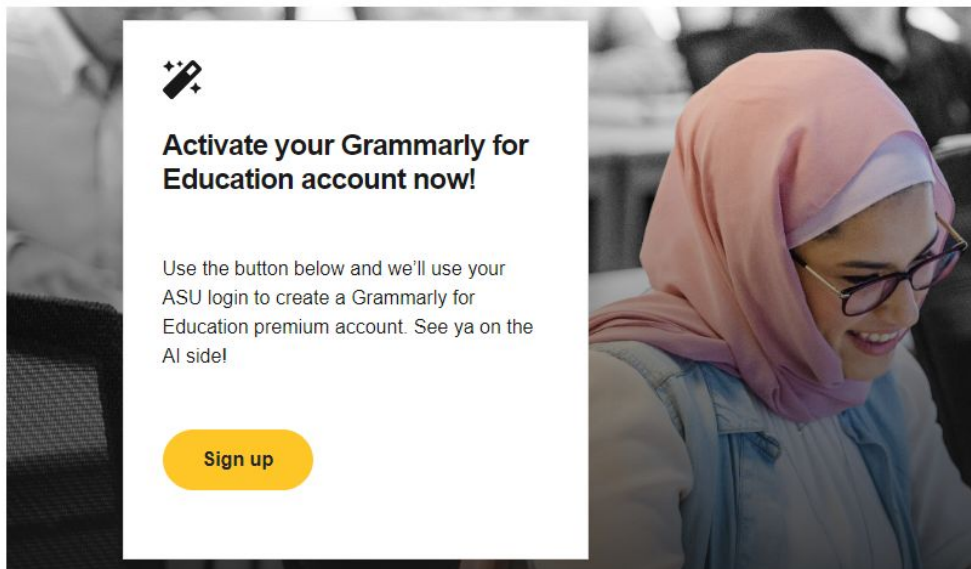
Computer Applications and Information Technology

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!



[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](#)