

# Computer Programming – CS 6011

## Lecture 15: Web Chat Client

MASTER OF SOFTWARE DEVELOPMENT (MSD) PROGRAM

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# Miscellaneous

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- ▶ Midterm
  - ▶ How did it go?
- ▶ Questions on anything?



# Some Quick Review / Misc.Topics



# CORS Error

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- ▶ Cross-Origin Resource Sharing (CORS)
  - ▶ How do browser requests work?
  - ▶ Browsers only allow JavaScript to talk (AJAX/ WebSockets) to the host the JavaScript file (myScript.js) was loaded from.
  - ▶ Thus the AJAX request can only go to (in this case) localhost (without raising a security error).

## Client (Browser)

Ask for index.html  
Ask for myScript.js  
AJAX connection to  
google...

## Server (localhost)

index.html

```
...  
<script src="myScript.js">  
...
```

myScript.js

```
...  
let ajax = new XMLHttpRequest();  
ajax.open( "GET", "http://google.com/data.html" );  
...
```

## Server (google.com)

data.html

...

Security ERROR

▶ localhost:8080/index.html vs

▶ file:///index.html



# Static Variables

- Draw a bubble diagram for the following code:

```
class Fraction {  
    int num_, denom_;  
    boolean reduced_;  
}
```

```
Fraction f1 = new Fraction( 3, 4 );
```

```
Fraction f2 = new Fraction( 5, 10 );
```

f1

num\_ -> 3  
denom\_ -> 4  
reduced = true;

f2

num\_ -> 5  
denom\_ -> 10  
reduced = false;



# Static Variables

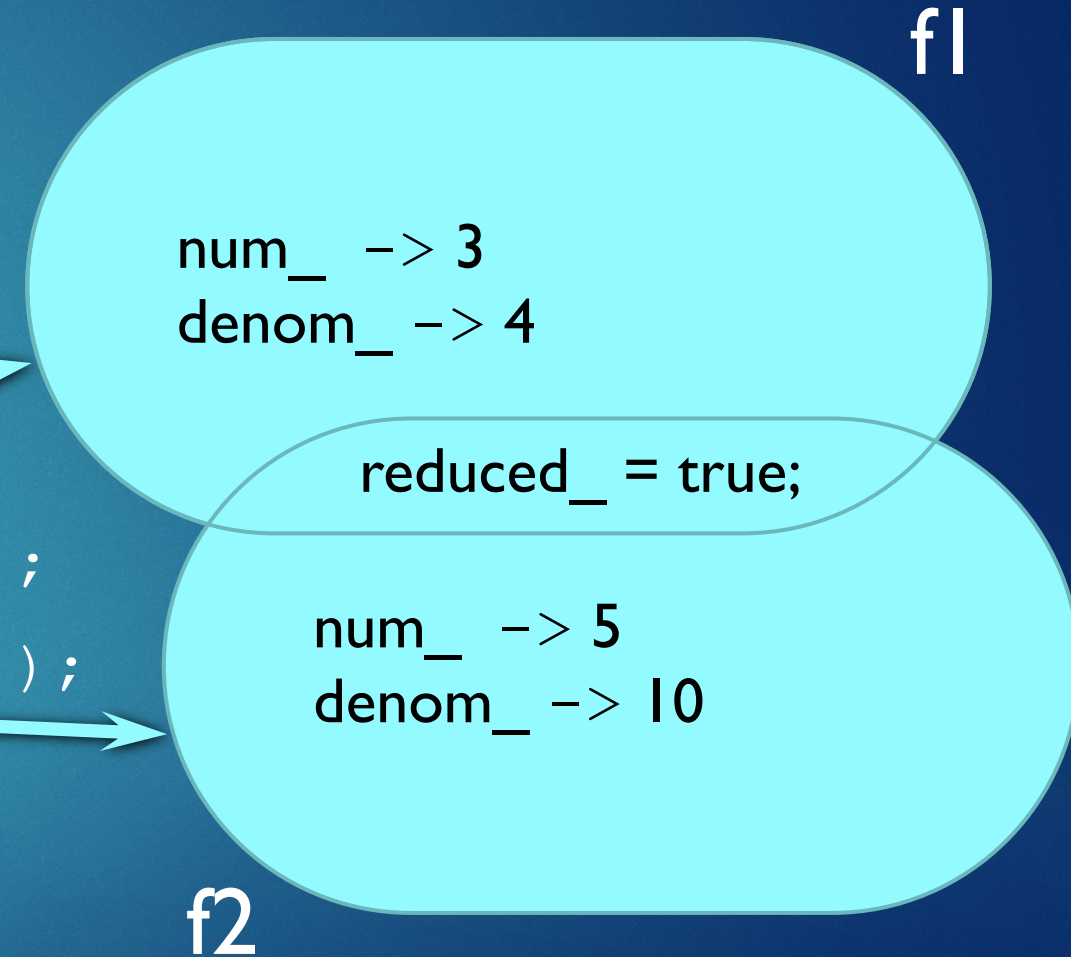
- ▶ Draw a bubble diagram for the following code:

```
class Fraction {  
    int num_, denom_;  
    static boolean reduced_;  
}
```

```
Fraction f1 = new Fraction( 3, 4 );
```

```
Fraction f2 = new Fraction( 5, 10 );
```

- ▶ What is the value of `reduced_` for `f2`?





# Static Variables

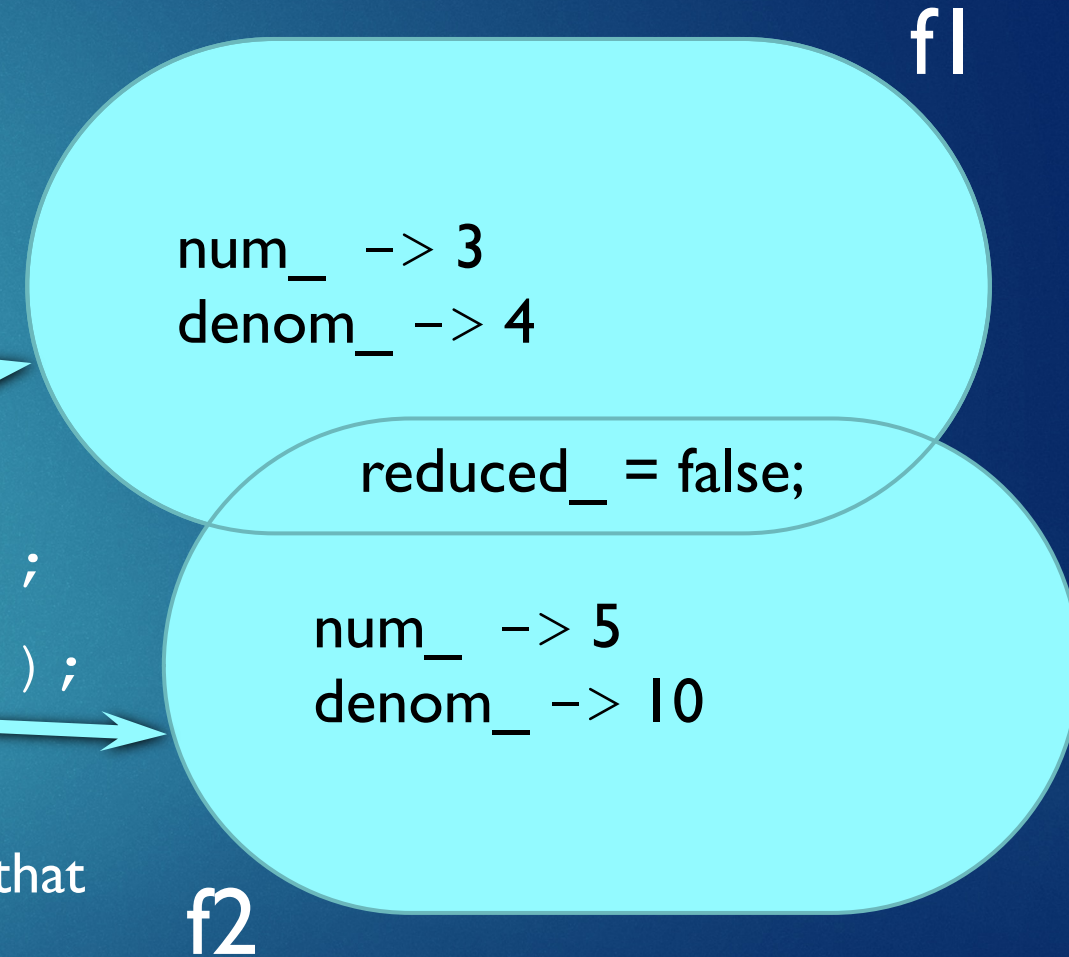
- ▶ Draw a bubble diagram for the following code:

```
class Fraction {  
    int num_, denom_;  
    static boolean reduced_;  
}
```

```
Fraction f1 = new Fraction( 3, 4 );  
Fraction f2 = new Fraction( 5, 10 );
```

- ▶ Static member variable definition:

- ▶ A variable that is shared among all instances of that class (all objects of that class).





# Static Methods

- ▶ What is the difference between a method and a function?
  - ▶ Methods are associated with classes / objects
- ▶ What's the difference between a class and an object?
  - ▶ Objects are instantiations of classes... Classes are “blueprints” of what to build.
- ▶ How do you call a function? How do you call a method?
  - ▶ `doit();` // Function call. // Better way of doing this?
  - ▶ `int x = doit();` // Almost all functions return data that needs to be store somewhere
  - ▶ How to call a Method?
    - ▶ `car.setSpeed()` // object dot method
- ▶ So, what is a static method?
  - ▶ A method that is not (directly) associated with a specific object.
  - ▶ `ArithmeticUtilityClass.add( x, y );` // Classname dot Static Funtion Name



# Lecture 15 – Topics

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## ▶ Web Chat Client



# Web Chat Client

- ▶ Demonstration
- ▶ The Server is provided to you.
  - ▶ Make sure you are running version 1 . 2
  - ▶ The server is an HTTP server and supports WebSockets.
- ▶ Read the assignment and then talk with your classmates about how to approach this project. Then we'll discuss your ideas, and you'll have time to begin working on it.
  - ▶ 20 Minutes



# Things to Consider

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- ▶ When do you create the WebSocket?
  - ▶ Anyone remember how to create a WebSocket?



# Web Socket Review - JavaScript Side

```
let ws = new WebSocket( "url" );  
ws.onopen = handleOpenCB; // Question: can we miss the 'open' event?  
ws.onmessage = handleMsgCB;  
// onclose, on error...
```

► How to create handleMsgCB? What causes it to be called (executed)?

```
function handleMsgCB( event ) {  
    // What is event?  
    // It contains the data about the message (event) that caused this  
    // callback to be called.  
    // Perhaps most importantly, it has the data sent from the server:  
    let msg = event.data;  
    // ...  
}
```



# Things to Consider (Cont.)

- ▶ Did you verify that the room name is valid?
  - ▶ How do you validate it?
- ▶ Do you allow messages to be sent before the WebSocket is open?
  - ▶ eg: the “join” message?
- ▶ What does the message from the server look like?
  - ▶ JSON string, which looks like?
    - ▶ `{ "type" : "message",  
 "user" : "Davison",  
 "room" : "testroom",  
 "message" : "Hello, how are you?" }`
  - ▶ How do you interpret / parse this string?
    - ▶ Turn it into an object...
    - ▶ `let msgObj = JSON.parse( string );`
- ▶ How do you turn the message from the server into something that appears on the screen?
- ▶ What do you do if the server dies?



# Web Socket Review - JavaScript Side (Cont.)

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- ▶ How to send a message to the server?

```
ws.send( <message> );
```

- ▶ What does a <message> look like?

```
ws.send( "join Davison cs6011room" ); // other message  
types?
```

```
ws.send( "message How are you?" ); // something  
missing?
```

- ▶ Why isn't the room name or user name sent in the **message**?

- ▶ Server already knows which room you are in based on the "join" message.

- ▶ Why aren't there quotes around "How are you?"?

- ▶ Everything after the user name is the message (until the end of line).



# Monday Assignments

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- ▶ Assignment – Web Chat Client



~ Fin ~