

Informatics 134

Software User Interfaces
Spring 2021

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5/06/2021

Agenda

1. Upcoming

2. More Toolkit Concepts

Upcoming

Upcoming

- A3 QA and Discussion
- Lecture next Tuesday on geometry management
- Keep working on A3 (DUE 5/18)
- Keep working on T3 (DUE EOQ, Critique 5/13)

More Toolkit Concepts

Event Callbacks

User input, events, and action

Differ across programming languages
and toolkits

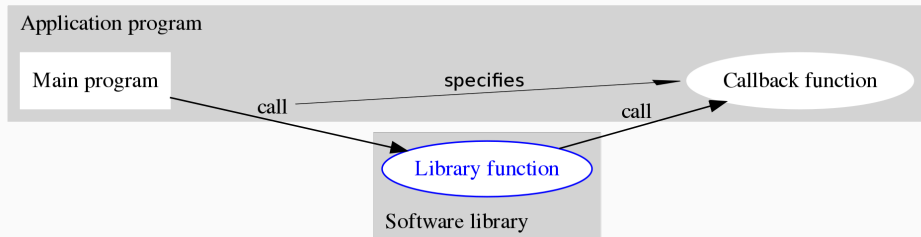
Referred to as: “callbacks”, “event
handlers”, “actions”, and others

User input, events, and action

In the browser...

Input widgets (text, check, button,
heading, div, etc)

Angular's data bindings (e.g., "ng-bind")



[Wikipedia, 2021]

An HTML and Javascript Example

A function is referenced via HTML attribute and *called* when the specified event is performed (a click).

```
1 function buttonClick(e){  
2     ...do some action  
3 }
```

```
1 <button onclick="buttonClick(this)">...</button>
```

User input, events, and action

In Javascript and SVG.js

Callbacks are functions that we pass as objects

First, we must make the function anonymous

And because functions are first-class citizens in JavaScript...?

```
1 function handleClick(e){  
2     ...do some action  
3 }  
4  
5 // becomes:  
6  
7 var handleClick = function(e){  
8     ...do some action  
9 }  
8
```

User input, events, and action

In Javascript and SVG.js

We can pass them to other functions as arguments.

```
1 var buttonClick = function(e){  
2     console.log(e)  
3 }  
4  
5 function MyCallback(action){  
6     action("MyCallback was called")  
7 }  
8  
9 MyCallback(buttonClick)
```

```
1 > "MyCallback was called"
```

User input, events, and action

In Javascript and SVG.js

Callbacks are functions that we pass as objects

User input, events, and action

In Javascript and SVG.js

We can use callbacks to customize the propagation of input events

In the example from A3, where is the callback?

```
1 var btn = new MyToolkit.Button;  
2 btn.onclick(function(e){  
3     console.log(e);  
4 });
```

```
1 var MyToolkit = (function() {  
2     var Button = function(){  
3         var clickEvent = null  
4         rect.click(function(event){  
5             if(clickEvent != null)  
6                 clickEvent(event)  
7         })  
8         return {  
9             onclick: function(eventHandler){  
10                 clickEvent = eventHandler  
11             }  
12         }  
13     }  
14     return {Button}  
15 }());
```

Event Callbacks

User input, events, and action

In Javascript and SVG.js

Why? How do callbacks help us build toolkits?

Event Callbacks

User input, events, and action

In Javascript and SVG.js Why? How do
callbacks help us build toolkits?

- Separation of concerns

- Clean up operations

- Pass control to consuming code

- Asynchronous operations (promises in JS)

QA and Assignment Discussion

References

References i



Wikipedia (2021).

Callback (computer programming).