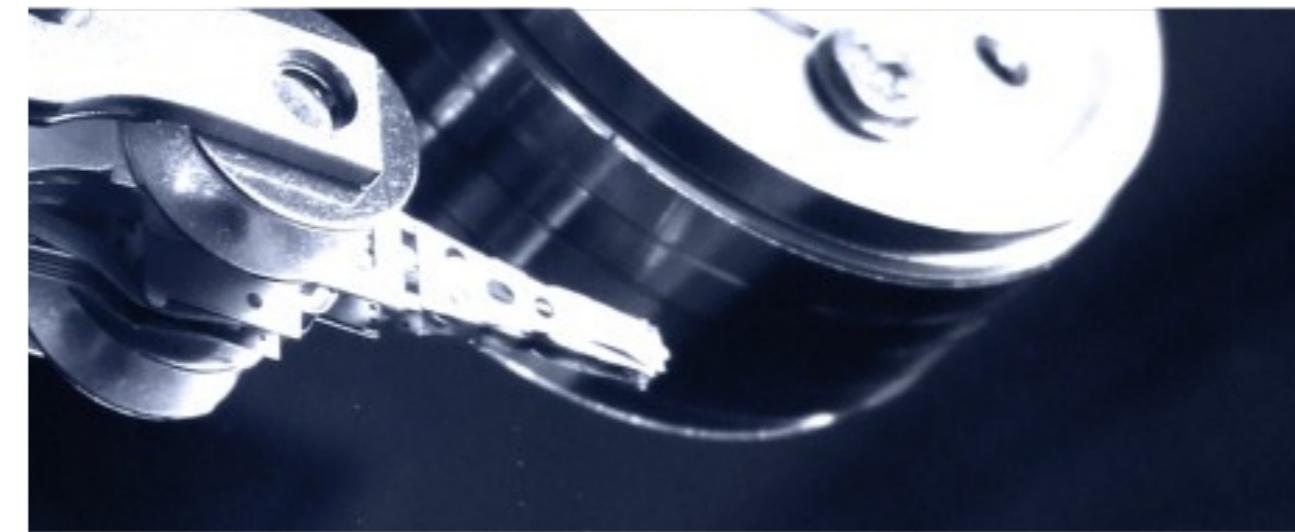




FULL SAIL
UNIVERSITY.

web design and development



programming for web applications 1

courseMaterial.2

courseMaterial.2

goal1 .Recap

goal1.Recap

- ▶ questions from goal 1 which was a review of the items from WPF
 - ▶ variables & values
 - ▶ numbers
 - ▶ strings
 - ▶ arrays
 - ▶ conditionals
 - ▶ functions
- ▶ hands on review of assignment 1



today's Objective

- ▶ course material

- ▶ explore a little deeper the topics covered in course materials 1

▶ more.Strings	▶ more.Numbers	▶ moreBOOLEANS
▶ more.Arrays	▶ more.Operators	▶ more.Conditionals
▶ more.Functions		

- ▶ new topic: self executing function, loops
 - ▶ practice all the new materials

- ▶ assignment

- ▶ fine tune the concepts from the course materials

courseMaterial.2

more.Strings

(*more than what was in WPF :)*)

more.Strings

method	description
charAt()	Returns the character at the specified index.
charCodeAt()	Returns a number indicating the Unicode value of the character at the given index.
concat()	Combines the text of two strings and returns a new string.
indexOf()	Returns the index within the calling String object of the first occurrence of the specified value, or -1 if not found.
lastIndexOf()	Returns the index within the calling String object of the last occurrence of the specified value, or -1 if not found.
localeCompare()	Returns a number indicating whether a reference string comes before or after or is the same as the given string in sort order.
length()	Returns the length of the string.
match()	Used to match a regular expression against a string.

more.Strings

method	description
replace()	Used to find a match between a regular expression and a string, and to replace the matched substring with a new substring.
search()	Executes the search for a match between a regular expression and a specified string.
slice()	Extracts a section of a string and returns a new string.
split()	Splits a String object into an array of strings by separating the string into substrings.
substr()	Returns the characters in a string beginning at the specified location through the specified number of characters.
substring()	Returns the characters in a string between two indexes into the string.
toLocaleLowerCase()	The characters within a string are converted to lower case while respecting the current locale.

more.Strings

method	description
toLocaleUpperCase()	The characters within a string are converted to upper case while respecting the current locale.
toLowerCase()	Returns the calling string value converted to lower case.
toString()	Returns a string representing the specified object.
toUpperCase()	Returns the calling string value converted to uppercase.
valueOf()	Returns the primitive value of the specified object.

more.Strings

► string methods

.charAt(index)

- returns the character at the given index position

```
"James Bond".charAt(2)           //returns "B"
```

.toLowerCase() or .toUpperCase()

- converts all of the characters in the string

```
"James Bond".toLowerCase()      //returns "james bond"
```

more.Strings

► string methods

.indexOf(*string*)

- returns the first found index position of the given character set.

```
"James Bond".indexOf("m")           //returns 2
```

```
"James Bond".indexOf("Bond")        //returns 6
```

.slice(*start_index, end_index*)

- returns a new string slice using index positions - the 2nd value is a “stop”

```
"James Bond".slice(6,7)             //returns "B"
```

```
"James Bond".slice(6,8)             //returns "Bo"
```

```
"James Bond".slice(6)               //returns "Bond"
```

more.Strings

► string methods

.split(*separator*, *limit*)

- ▶ creates an array by splitting the string using the given character set
- ▶ *limit* is an optional parameter, limiting the amount of splits.

```
"a,b,c,d".split(",")           // ['a', 'b', 'c', 'd']  
"a-b-c-d".split("-", 3)        // ['a', 'b', 'cd']
```

courseMaterial.2

more.Numerics

(*more than what was in WPF :)*)

more.Numbers

method	description
constructor()	Returns the function that created this object's instance. By default this is the Number object.
toExponential()	Forces a number to display in exponential notation, even if the number is in the range in which Javascript normally uses standard notation.
toFixed()	Formats a number with a specific number of digits to the right of the decimal.
toLocaleString()	Returns a string value version of the current number in a format that may vary according to a browser's locale settings.
toPrecision()	Defines how many total digits (including digits to the left and right of the decimal) to display of a number.
toString()	Returns the string representation of the number's value.
valueOf()	Returns the number's value.

more.Numbers

▶ number methods

.toFixed(*number*)

- ▶ formats a number with a specific number of digits to the right of the decimal

```
var num = 45.7896  
console.log(num.toFixed(2));      //returns 45.78
```

courseMaterial.2

more.Booleans

(*more than what was in WPF :)*)

more.Booleans

- ▶ **truthy / falsy**
 - ▶ javascript always tries to interpret values if it can - this results in things that are equal to false (*falsy*), but are not the same thing as **false**

falsy values

- ▶ **false**
- ▶ **null**
- ▶ **undefined**
- ▶ **""**
- ▶ **0**
- ▶ **NaN**

truthy

- ▶ any other value is considered “truthy”

```
var myStr = "a string";
if (myStr) {
    // evaluates to true
};
```

more.Booleans

- ▶ truthy / falsy

```
var myNum = 0;  
if (myNum) {  
    // evaluates to false;  
};
```

```
var myStr = "";  
if (myStr) {  
    // evaluates to false  
};
```

```
var myBool = false;  
if (myBool) {  
    // evaluates to false  
};
```

more.Booleans

- ▶ **truthy / falsy**
 - ▶ if you try to reference a variable that does not exist, javascript identifies missing values as **undefined**
 - ▶ this is also the default value for any variable, such as:

```
var a, b, c;  
alert(a); //alerts undefined
```

- ▶ **null** exists in javascript, but incorrectly - instead, check for **undefined** values
- ▶ IF you wanted a null you would have to specifically set a variable to null

```
var a = null;  
alert(a); //alerts undefined
```

courseMaterial.2

more.Arrays

(*more than what was in WPF :)*)

more.Arrays

method	description
concat()	Returns a new array comprised of this array joined with other array(s) and/or value(s).
every()	Returns true if every element in this array satisfies the provided testing function.
filter()	Creates a new array with all of the elements of this array for which the provided filtering function returns true.
forEach()	Calls a function for each element in the array.
indexOf()	Returns the first (least) index of an element within the array equal to the specified value, or -1 if none is found.
join()	Joins all elements of an array into a string.
lastIndexOf()	Returns the last (greatest) index of an element within the array equal to the specified value, or -1 if none is found.

more.Arrays

method	description
map()	Creates a new array with the results of calling a provided function on every element in this array.
pop()	Removes the last element from an array and returns that element.
push()	Adds one or more elements to the end of an array and returns the new length of the array.
reduce()	Apply a function simultaneously against two values of the array (from left-to-right) as to reduce it to a single value.
reduceRight()	Apply a function simultaneously against two values of the array (from right-to-left) as to reduce it to a single value.
reverse()	Reverses the order of the elements of an array -- the first becomes the last, and the last becomes the first.
shift()	Removes the first element from an array and returns that element.

more.Arrays

method	description
slice()	Extracts a section of an array and returns a new array.
some()	Returns true if at least one element in this array satisfies the provided testing function.
toSource()	Represents the source code of an object
sort()	Sorts the elements of an array.
splice()	Adds and/or removes elements from an array.
toString()	Returns a string representing the array and its elements.
unshift()	Adds one or more elements to the front of an array and returns the new length of the array.

more.Arrays

► array methods

.join(string)

- converts all the elements of an array into strings, and concatenates those strings together.

```
[ 'a', 'b', 'c' ].join(","); //returns "a,b,c"
```

.reverse()

```
[ 'a', 'b', 'c' ].reverse(); // ['c','b','a']
```

more.Arrays

.slice(*start_index*, *end_index*)

- ▶ if only the **start** position is provided, it will begin there and continue to the end of the whole array.
- ▶ if an **end** is specified, it will go up to but not include the end position
- ▶ negative numbers can be used to target the end of the array

```
myArr = [1,2,3,4,5];
myArr.slice(0, 3);           // returns [1,2,3]
myArr.slice(3);             // returns [4,5]
myArr.slice(1, -1);         // returns [2,3,4]
```

more.Arrays

.push()

- ▶ array.push() will append one or more new elements to the **end of an array** - if you assign this to a variable, the variable will equal the length of the array

```
myArr = ["Joe", "Kid"];
myArr.push("Mike", "Tony"); //returns ["Joe", "Kid", "Mike", "Tony"]
```

.pop()

- ▶ array.pop() will **delete the last element** inside the array

```
myArr.pop(); //returns ["Joe", "Kid", "Mike"]
```

more.Arrays

.unshift()

- ▶ array.**unshift()** will append one or more new elements to the **beginning** of an array - similar to how push() works

```
myArr = ["Joe", "Kid"];
myArr.unshift("Mike", "Tony"); //returns ["Mike", "Tony", "Joe", "Kid"]
```

.shift()

- ▶ array.**shift()** will **delete the first element** inside the array, the opposite of pop()

```
myArr.shift(); //returns ["Tony", "Joe", "Kid"]
```

more.Arrays

.sort()

- ▶ array.sort() sorts the elements of the array based on a *comparison function* - if no comparison is provided, it is sorted alphabetically (a to z)

```
myArr.sort();
```

- ▶ the below will not sort numbers correctly!
- ▶ for more complex sorting, we'll need a *comparison function*

```
myArr.sort(function(){ } );
```

more.Arrays

.sort()

- ▶ with a comparison function, we'll pass "a" and "b" as arguments - the comparison function will store 2 elements of the array into **a** and **b** and use a **return** comparison, that is either **< 0**, **> 0**, or **= 0**.

```
myArr = [ 3, 1, 5, 4 ];
myArr.sort( function(a,b){
  return a-b;
} );
```

- ▶ **< 0** will put a before b
- ▶ **> 0** will put b before a
- ▶ **0** will not change their position from each other.

- ▶ in this example, it will sort the array by ascending numbers (a - b) // 1,3,4,5
- ▶ **return b - a** would return descending instead

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more.Operators

(*more than what was in WPF :)*)

more.Operators

▶ **typeof operator**

- ▶ **typeof** is a unique operator that takes a variable and returns its data type as a lowercase text string - the data types are:

- ▶ “**undefined**”
- ▶ “**boolean**”
- ▶ “**number**”
- ▶ “**string**”
- ▶ “**function**”
- ▶ “**object**” (*matches arrays too*)

```
var myStr = "jamesBond;  
alert( typeof myStr );  
//returns "string"
```

```
var myNum = 5;  
alert( typeof myNum );  
//returns "number"
```

more.Operators

▶ **typeof** operator

- ▶ if we need to determine if a variable exists, we can do the following:

```
if ( typeof myNum === "undefined" ){  
    //myNum is not set  
};
```

```
if ( typeof myString === "undefined" ){  
    //myString is not set  
}else{  
    //myString is set  
};
```

courseMaterial.2

more. **Conditionals**

(*more than what was in WPF :)*)

more. Conditionals

► switch statement

- ▶ “if” conditionals are perfect for comparing several sets of varying conditions
- ▶ switch statements will evaluate a single *conditional expression* and then perform an equality check against possible **cases**
- ▶ let’s look at an “if” statement being performed by a “switch” instead...

more.Conditionals

```
switch ( myArray[ 6 ] ){

    case 9:
        // code
        break;

    case 8:
        // code
        break;

    case 7:
        // code
        break;

    default:
        // code
        break;

};
```

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more.**Functions**

(*more than what was in WPF :)*)

more.Functions Notes

► **function** returning a boolean, using conditionals

- ▶ only one return statement in a function will ever be executed - but this doesn't restrict functions to only having a single return
- ▶ if a function has **no return** statement, or uses a return without a value, the function automatically returns the value *undefined*

```
function functionName() {  
  if(condition){  
    return true;  
  }else{  
    return false;  
  }  
};
```

more.Functions Notes

- ▶ **function** returning multiple values **using an array**

```
function functionName() {  
    return ["ferrari", "lambo", "vwBug"]  
};  
var myList = functionName(); //will return the array of values
```

- ▶ **function** directly within some other code

```
function functionName() {  
    return "ferrari";  
};  
var msg = 'jamesBond drives a ' + function();  
//will return the "jamesBond drives a ferrari"
```

more.Functions

► selfExecuting function

- an anonymous function that is run automatically as soon as it is defined

```
(function(){    //this is a basic function which includes () at end  
    //code goes here  
}());           //the () tells the function to run immediately
```

courseMaterial.2

javascript. Loops

javascript.Loops

► loops - general information

- ▶ javascript will be utilizing the same loops that most programming languages share:
while and **for**
- ▶ loop/repeat a block of code until a *condition* is met
- ▶ the most common use of loops is to cycle through all the values of an **array** or other forms of data set (*such as objects*)
- ▶ a **counter** is needed which is a simple numeric variable that increases or decreases
- ▶ the *condition* that a loop checks for is usually against the **counter** variable
- ▶ common variable names for counters are **i** and **x** - most developers reserve these names for this purpose

javascript.Loops

- ▶ **while ()**

- ▶ the **while** loop is the simplest conditional loop

```
while ( condition ) {  
    //code goes here  
}
```

- ▶ before the code is executed, the condition is checked
- ▶ if it evaluates to *true*, the code is run, and the loop returns to the condition check again
- ▶ it will repeat this process until the condition becomes *false*, which will then skip the code and exit the loop

javascript.Loops

► **for ()**

- ▶ a **for** loop is an increment-based loop, where the increment is part of the condition
- ▶ there are 3 statements inside the condition of a **for** loop:

```
for ( var i = 0; i < 5; i++ ) {  
    //code goes here  
};
```

- ▶ first a counter variable is initialized
- ▶ second the “condition check”
- ▶ and third, increment the variable and perform the code till the end of the loop
- ▶ each is separated by semicolon, just like normal statements

javascript.Loops

► array.length

- ▶ if we wanted to cycle through all the values in an array, we need to know how many values are in the array
- ▶ this is where the **.length** property comes in - this will return a **number** value, equal to the number of elements in the array
- ▶ an array's numeric **index** begins at 0
- ▶ in the example below, the last index of the array would be 4 - the **.length** property returns the *count*, which would be 5

```
var myNums = [1, 2, 3, 4, 5];
alert( myNums.length );      //returns a "5"
```

javascript.Loops

- ▶ **for ()**
 - ▶ the for loop is the most commonly used in programming, since the increment makes it easy to cycle through arrays or objects.
 - ▶ to cycle through each index of an array, we could use the **.length** property, and use the counter **i** as the index, such as:

```
for ( var i=0; i<myNums.length; i++) {  
    alert( myNums[i] );  
}
```

- ▶ however, this is not the most efficient way...

javascript.Loops

- ▶ **for ()**
 - ▶ depending on the size of an array, it can be more efficient to save the array length in a variable, inside the first statement

```
for (var i=0, j=myArr.length; i<j; i++){  
    alert( myNums[i] );  
}  
;
```

javascript.Loops

► breaking.Loops

- ▶ in some situations, you may need to force a loop to stop
- ▶ by using the **break** statement, any loop will stop running at the break point, and perform no more iterations

```
for (var i=0, j=myArr.length; i<j; i++) {  
    if (condition) {  
        break;  
    };  
    //...;  
};
```

javascript.Loops

► continue.Loops

- ▶ while the **break** statement will stop a loop and exit it, the **continue** statement will stop a loop's current iteration, and continue on to the next iteration

```
for (var i=0, j=myArr.length; i<j; i++) {  
    if (condition) {  
        continue;  
    };  
    //...;  
};
```

Assignment / Goal 2

- ▶ **Goal2: Assignment: JavaScript Practice**
 - ▶ Log into FSO. This is where all your assignment files will be located as well as Rubrics and assignment instructions.
- ▶ **Goal2: Assignment: The Duel - Part II**
 - ▶ You will use the same files you used for the Duel - Part 1, for this assignment. See FSO for the assignment instruction.
- ▶ **Commit your completed work into GitHub**
 - ▶ As part of your grade you will need at least 6 reasonable GIT commits for each assignment.
- ▶ **In FSO there is an announcement with “Course Schedule & Details” in the title, in that announcement you will see a “Schedule” link which has the due dates for assignments.**