CPSC 1045: <SELECT> AND ARRAYS

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<select>

- The select tag creates drop down boxes on the webpage
  - Textfield allows the user to type anything,
  - <select> gives the user on a few choices
- The advantage of using select, is that we are guaranteed that the input will be one of the choices.
- To specify options in a <select> tag, we use <option> tags, which are nested inside the <select>

```
<select id="myChoices">
    <option value="tall">Tall</option>
    <option value="grande">Grande</option>
</select>
```

Review

- Values
  - have type
  - they represent a concrete number, string, or other type
    - eg: 1 , “cow”

- Variables
  - variables holds values in memory
  - we can change the values of variables
  - we use it to carry around information in our programs

What are arrays 1/2

- Arrays are a ordered set of elements
- The elements usually start from 0.
- And the indexes usually increase.

- They can be used to store Lists of things
- They can be used to represent a set of related variables.
  - Eg: choice1, choice2, choice 3
    - Can be replaces with an array called choices

What are arrays 2/2

- Arrays variables have a name
- Array elements, are the individual values in the array
- Array elements are then referred by the array's name, and the index of the element.
- The index starts from 0.

A variable represent one choice

choice0	26

A array representing 7 choices

	0	1	2	3	4	5	6
choices	5	3	2	3	4	2	1

Creating arrays

Method 1: Array function

eg:

var storage = Array(5);

creates an array of length 5, with values undefined stored in each element.

	0	1	2	3	4
storage	undefined	undefined	undefined	undefined	undefined

Creating Arrays

- Method 2: square brackets [ ]
- example 1:
- var storage = [ ];
- Creates and empty array

Example 2:

- var storage = [“apple”, “orange”, “peach”]
- cerates an array of size 3, with strings stored in each elements.

	0	1	2
storage	“apple”	“orange”	“peach”

Accessing Array elements

- To access an element in an array, we use the
  - The array name
  - The [ ] square brackets
  - And a index in the square brackets.

	0	1	2
storage	"apple"	"orange"	"peach"

  - storage[1] will have the value "orange"

  - storage[0] = "grape"
  - will change the 0'th element to "grape"

	0	1	2
storage	"grape"	"orange"	"peach"

Adding elements to an array

- Arrays in JavaScript can change size.
- We can add new elements to an array.

	0	1	2
storage	"grape"	"orange"	"peach"

- Assuming we have the above array
- we can use the **push** method to add elements to the end of the array
- storage.push("pear");

	0	1	2	3
storage	"grape"	"orange"	"peach"	"pear"

Removing elements from an array

- We can remove elements from the end of the array with the **pop** method.

	0	1	2	3
storage	"grape"	"orange"	"peach"	"pear"

- storage.pop();

	0	1	2
storage	"grape"	"orange"	"peach"

Processing an array with for loops

- Because we can access each element of an array via an index, it makes sense that we can then process arrays with loops.
- We can obtain the length of the array with the length property

	0	1	2
storage	3	6	9

- Lets double all the elements

```
for(var i = 0; i < storage.length; i = i +1){
   storage[i] = 2*storage[i];
}
```

Copying arrays

- We can make a shallow copy of an array with the slice method.

- var storageCopy = storage.slice();

Checking if a value is already stored in an array

- We can use the indexOf method to check if a value is stored in an array
  - If it is in the array, the method will return the 1st index the value occurs
  - If it is not in the array, the method will return -1

	0	1	2	3
storage	"grape"	"orange"	"peach"	"pear"

  - storage.indexOf("orange")
    - has the value of 1, because "orange" is at index 1
  - storage.indexOf("watermelon")
    - has the alue of -1, because "watermelon" is not in the array

2D arrays

- 2D arrays are array of arrays.
- They are handy for representing grids, or tables in our programs.

storage	0	1	2
0	4	7	9
1	10	15	12
2	23	7	4

- storage[0]
  - returns the first row [4, 7, 9]
- Storage[0] [1]
  - return the value at row 0, and column 1 which is 7