

# Data Structures in JS

*Moving Beyond the Variable*

SE111 | Week 8





# Key & Value Pairs



A key is a word or name associated with data - *keys reference data*

A value is the data associated with a key - *data is stored using keys*

key = value

Variables are the most basic form of key & value pairs

1 variable → 1 value

```
var student = "Eric"
```

```
//to access the value "Eric", we can use the variable name ( key) student
```



# Data Structures

- Allows for more than one value to be stored to name
- An *organized* way of storing data
- Name + key & value pairs are needed

[ Arrays ]

[ ]

{ Objects }

{ }

*visual signifiers for each*



# Arrays

- Multiple points of data
- Similar data
  - same data type
  - *collection* of similar data
    - *names, ages, grades, emails*
- Best for when:
  - Order is important
  - Beginning | Middle | End
  - *Batch processing* data plans

key → index

Index is automatically assigned

```
var studentArray = [  
  "Eric",  
  "Jess",  
  "Mark",  
  "Tanya",  
  "Angela"  
]
```

//to access "Mark"

studentArray[2]

//to add "David"

studentArray[5] = "David"

0	Eric
1	Jess
2	Mark
3	Tanya
4	Angela
5	David

arrayName[index] = value

# Parallel Arrays

- Allows for different data types, still organized but *s e p a r a t e*
- Multiple arrays where data is **connected via matching index**

```
var studentArray = [
```

```
0  "Eric",  
1  "Jess",  
2  "Mark",  
3  "Tanya",  
4  "Angela"  
]
```

```
var colorArray = [
```

```
0  "red",  
1  "orange",  
2  "yellow",  
3  "blue",  
4  "green"  
]
```

```
var gradeArray = [
```

```
0  90,  
1  88,  
2  92,  
3  99,  
4  84  
]
```

```
console.log(`${studentArray[2]}'s current grade is a ${gradeArray[2]} and they love the color ${colorArray[2]}')
```

Mark's current grade is a 92 and they love the color yellow



# Associative Arrays

```
var studentNames = [ ]  
  
studentNames[`row1seat1`] = "Eric"  
studentNames[`row1seat2`] = "Jess"  
studentNames[`row1seat3`] = "Mark"  
studentNames[`row1seat4`] = "Tanya"  
studentNames[`row1seat5`] = "Angela"  
  
//to access "Mark"  
studentNames[`row1seat3`]  
  
//to add "David"  
studentNames[`row2seat1`] = "David"
```

key → string index

String index is assigned by the developer

`row1seat1`	Eric
`row1seat2`	Jess
`row1seat3`	Mark
`row1seat4`	Tanya
`row1seat5`	Angela
`row2seat1`	David

arrayName[*"stringIndex"*] = value

# Objects

- Multiple points of data that belong together or are related
- Different data types
  - *strings, numbers, booles, arrays, objects, functions...*
- Best for when:
  - Order is NOT important
  - Data needs to “stay together”
  - Data is related to main object

key → property

*The Developer chooses the property name*

*objectName.property = value*

dot syntax!

```
var personObject = {  
  first: "Katie",  
  last: "Truchon",  
  hasPets: true,  
  faveNum: 7,  
  greeting: function(){  
    alert(`Hi there ${this.first}!`)  
  }  
}
```

*//to access Katie's First Name*

*personObject.first*

*//to add a new property, age value*

*personObject.age = 33*