WEEK TEN - DATA STRUCTURES
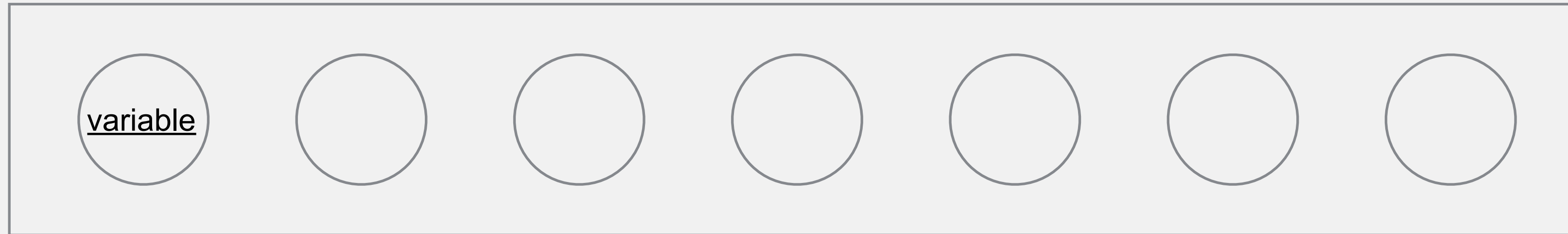
Arrays, Objects, and dynamic data structures

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DATA STRUCTURES

structure

variable

A **data structure** allows the program to use large amounts of information in order to manage itself.

All data structures are just **lists of variables**. But there are different types of structures, depending on use case and language.

ARRAYS

- **<u>Arrays</u>** are variables that contain other variables.

- An array is an **<u>ordered list</u>** of items.

- Each item has a **<u>unique index</u>** in the list

ARRAYS

```
var positions = [];
```

```
var positions = [ 0, 23, 45, 53, 67, 120 ];
```

Arrays can be initialized with or without members

ARRAYS

```javascript
var positions = [ 0, 23, 45, 53, 67, 120 ];
```

```javascript
console.log( positions[0] );
```

Members can be accessed with their unique index

ARRAYS

```js
// create an array with 6 members
var myList = [30, 20, 40, 50, 83, -12];
console.log(myList);


// add a member to the list
myList.push(400);
console.log(myList);


// remove first member
myList.shift();
console.log(myList);


// remove last member
myList.pop();
console.log(myList);


// remove two members, starting with index 1
myList.splice(2, 2);
console.log(myList);

```

Console

```
[30, 20, 40, 50, 83, -12]

[30, 20, 40, 50, 83, -12, 400]

[20, 40, 50, 83, -12, 400]

[20, 40, 50, 83, -12]

[20, 40, -12]
```

Common Array actions

ARRAYS

```javascript
var positions = [];
_____

for(var i = 0; i < 100; i++){

  positions.push( random(width) );

}
```

Arrays and loops are best friends!

ARRAYS

```javascript
for(var i = 0; i < positions.length; i++){

  point(i , positions[i]) ;

}
```

Arrays and loops are best friends!

OBJECTS

- **An Object** is a variable that can contain other variables.

- Each one is called a **property** (of the the object)

- Properties are **key-value pairs**

OBJECTS

```
var ball = {};
```

```
var ball = {
    x: 45,
    y: 202,
    color: "red"
};
```

Objects can be initialized with or without properties

OBJECTS

```
ball.radius = 20;
```

```
ellipse(ball.x, ball.y, ball.radius);
```

adding/setting properties

using properties

HOMEWORK #10

A homework assignment from a different course

Choose a homework assignment from one of the other courses from this term and create a solution of it using p5