

Lab Exercise 3

Collection Types

Array

Exercise 3.1

Create an empty array with values of type `Int` and assign it to a variable in as many ways as you can think of (there's at least 4 ways).

Exercise 3.2

Create an array containing the integer values 4, 8, 15, 16, 23, and 42. There are at least 4 ways to do this, as well.

Exercise 3.3

Create an array that cannot be modified containing the integer values 4, 8, 15, 16, 23, and 42.

Exercise 3.4

Add the values 1138, 1337, and 4711 to the end of the following array:

```
var stuff = [4, 8, 15, 16, 23, 42]
```

Exercise 3.5

Replace the value 15 with the value 17 in the following array:

```
var numbers = [4, 8, 15, 16, 23, 42]
```

Exercise 3.6

Replace the values 15, 16, and 23 with the values 1, 2, 3, 4, and 5 in the following array:

```
var numbers = [4, 8, 15, 16, 23, 42]
```

Exercise 3.7

Create an array containing 10 sheep "🐑" strings. Then print the length of the array.

Exercise 3.8

Write at least one variant of removing the last element in an array, where you don't know the length.

Set

Exercise 3.9

Given the following sets:

```
let houseAnimals: Set = ["🐶", "🐱"]
let farmAnimals: Set = ["🐱", "🐶", "🐷", "🐶", "🐱"]
let cityAnimals: Set = ["🐶", "🐱"]
```

Use set operations to...

1. ...determine whether the set of house animals is a subset of farm animals.
2. ...determine whether the set of farm animals is a superset of house animals.
3. ...determine if the set of farm animals is disjoint with city animals.
4. ...create a set that only contains farm animals that are not also house animals.
5. ...create a set that contains all the animals from all sets.

Dictionary

Exercise 3.10

Create an empty dictionary with keys of type String and values of type Int and assign it to a variable in as many ways as you can think of (there's at least 4 ways).

Exercise 3.11

Create a mutable dictionary named `secretIdentities` where the key value pairs are "Hulk" -> "Bruce Banner", "Batman" -> "Bruce Wayne", and "Superman" -> "Clark Kent".

Exercise 3.12

Given the dictionary from exercise 4.10, print the secret identity of Batman. Spoiler: It's Bruce Wayne.

Exercise 3.13

Given the dictionary from exercise 4.10, replace the secret identity of the Hulk with "David Banner", which was the Hulk's civilian name on the TV show for some reason. I guess they were not fans of alliteration, but I digress.

Exercise 3.14

Given the dictionary from exercise 4.10, iterate (with a for loop) over all the secret identities and print both the values and the keys.