Lab 02: HTTP, REST & ES6 Features

Objective(s):

1. Learn HTTP request
2. Learn XHR and AJAX
3. Learn ES6 Features

Lab Task(s):

Exercises

1. Write a function called **raceResults** which accepts a single array argument. It should return an object with the keys first, second, third, and rest.
    - first: the first element in the array
    - second: the second element in the array
    - third: the third element in the array
    - rest: all other elements in the array

Write a one line function to make this work using

- An arrow function
- Destructuring
- ‘Enhanced’ object assignment (same key/value shortcut)

```
raceResults(['Tom', 'Margaret', 'Allison', 'David', 'Pierre'])
/*
  {
    first: "Tom",
    second: "Margaret",
    third: "Allison",
    rest: ["David", "Pierre"]
  }
*/
```

2. Write a function which generates an animal object. The function should accepts 3 arguments:

- species: the species of animal (‘cat’, ‘dog’)
- verb: a string used to name a function (‘bark’, ‘bleet’)
- noise: a string to be printed when above function is called (‘woof’, ‘baaa’)

Use one or more of the object enhancements we’ve covered.

```
const d = createAnimal("dog", "bark", "Woooof!")
// {species: "dog", bark: ƒ}
d.bark()  //"Woooof!"

const s = createAnimal("sheep", "bleet", "BAAAAaaaa")
// {species: "sheep", bleet: ƒ}
s.bleet() //"BAAAAaaaa"
```

3. Write the following functions using rest, spread and refactor these functions to be arrow functions!
Make sure that you are always returning a new array or object and not modifying the existing inputs.

```
/** Return a new array with every item in array1 and array2. */
function extend(array1, array2) {
}

/** Return a new object with all the keys and values
from obj and a new key/value pair */
function addKeyVal(obj, key, val) {
}

/** Return a new object with a key removed. */
function removeKey(obj, key) {
}


/** Combine two objects and return a new object. */
function combine(obj1, obj2) {
}


/** Return a new object with a modified key and value. */
function update(obj, key, val) {
}
```

4. The built-in function setTimeout uses callbacks. Create a promise-based alternative.
   The function delay(ms) should return a promise. That promise should resolve after ms milliseconds, so that we can add .then to it, like this:

```
function delay(ms) {
  // your code
}

delay(3000).then(() => alert('runs after 3 seconds'));
```

5. Rewrite this example code from the chapter Promises chaining using async/await instead of .then/catch:

```
function loadJson(url) {
  return fetch(url)
    .then(response => {
      if (response.status == 200) {
        return response.json();
      } else {
        throw new Error(response.status);
      }
    });
}

loadJson('no-such-user.json')
  .catch(alert); // Error: 404
```

6. Below you can find the “rethrow” example. Rewrite it using async/await instead of .then/catch.
   And get rid of the recursion in favour of a loop in demoGithubUser: with async/await that becomes easy to do.

```
class HttpError extends Error {
  constructor(response) {
    super(`${response.status} for ${response.url}`);
    this.name = 'HttpError';
    this.response = response;
  }
}

function loadJson(url) {
  return fetch(url)
    .then(response => {
      if (response.status == 200) {
        return response.json();
      } else {
        throw new HttpError(response);
      }
    });
}

// Ask for a user name until github returns a valid user
function demoGithubUser() {
  let name = prompt("Enter a name?", "iliakan");

  return loadJson(`https://api.github.com/users/${name}`)
    .then(user => {
      alert(`Full name: ${user.name}.`);
      return user;
    })
    .catch(err => {
      if (err instanceof HttpError && err.response.status == 404) {
        alert("No such user, please reenter.");
        return demoGithubUser();
      } else {
        throw err;
      }
    });
}

demoGithubUser();
```

7. We have a “regular” function called f. How can you call the async function wait() and use its result inside of f?

```
async function wait() {

  await new Promise(resolve => setTimeout(resolve, 1000));

  return 10;

}
```

```
function f() {

  // ...what should you write here?

  // we need to call async wait() and wait to get 10

  // remember, we can't use "await"

}
```

8. It's time to build something fun with your knowledge of jQuery and AJAX! For this exercise we will be using the Giphy API! This will require you to use an API key and understand some of the documentation about the API, which you can see here.

   Here is what the URL would look like for search term of "hilarious" - http://api.giphy.com/v1/gifs/search?q=hilarious&api_key=dc6zaTOxFJmzC. You can click on this URL and see the JSON you will get back. To view this in a nicer format, we highly recommend using the JSON Viewer chrome extension.

   Your application should do the following:

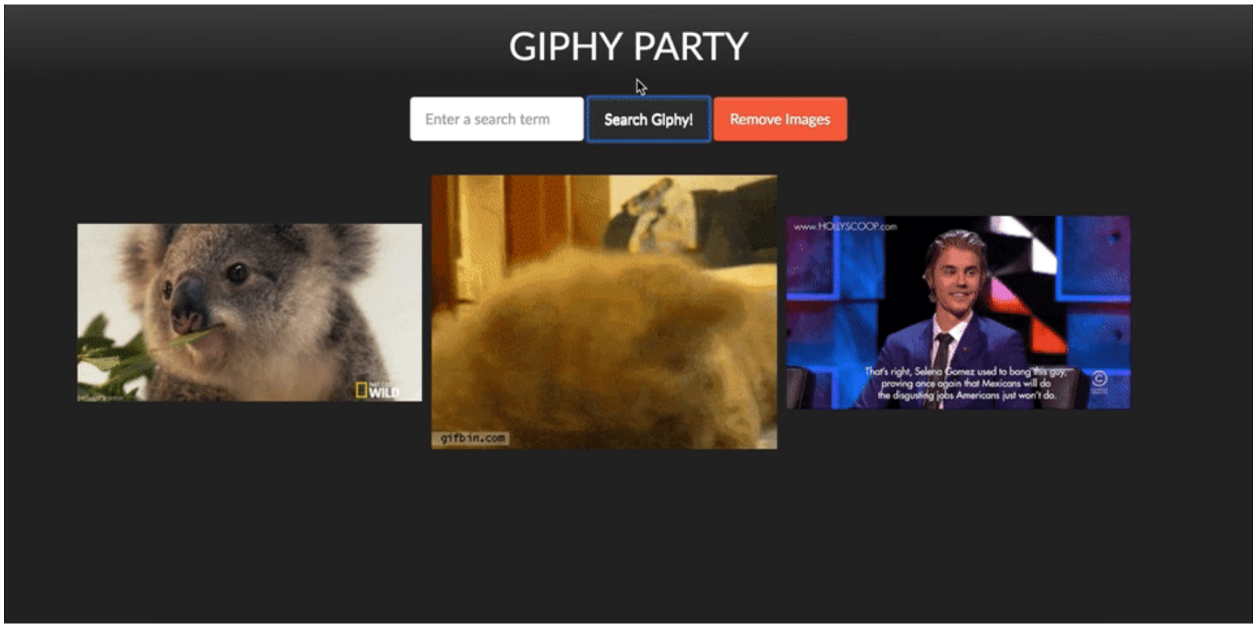
   Allow the user to search for a GIF and when the form is submitted, make an AJAX request to the Giphy API and return a single GIF

   Once the Giphy API has responded with data, append the GIF to the page

   Allow the user to search for as many GIFs as they would like and keep appending them to the page

   Allow the user to remove all of the GIFs by clicking a button

   Here is an example of what the application might look like:



9. Write a function called inOrder that accepts two callbacks and invokes them in order. Implement inOrder using the callback pattern.

```
var logOne = setTimeout(function() {
  console.log("one!");
}, Math.random() * 1000);

var logTwo = setTimeout(function() {
  console.log("two!");
}, Math.random() * 1000);

inOrder(logOne, logTwo);

// one
// two

// it should always log those two in order regardless of their
timing
```

- Refactor inOrder to use promises.

- Make an AJAX call to the Star Wars API (https://swapi.dev/api/) and get the opening crawl for each film in the series. Once you have finished that, loop through the array of planets for each movie and make more AJAX calls to collect the name of each planet, organized by film. Then, console log an array of objects in which each object contains the opening crawl for a specific movie, along with the names of every planet featured in that movie.

- Implement a simple version of **Promise.all**. This function should accept an array of promises and return an array of resolved values. If any of the promises are rejected, the function should catch them.