# Lab 8 (5/31)

## Submit your team number

**Question** *Submitted Jun 1st 2023 at 10:52:28 pm*

Please enter your team number.

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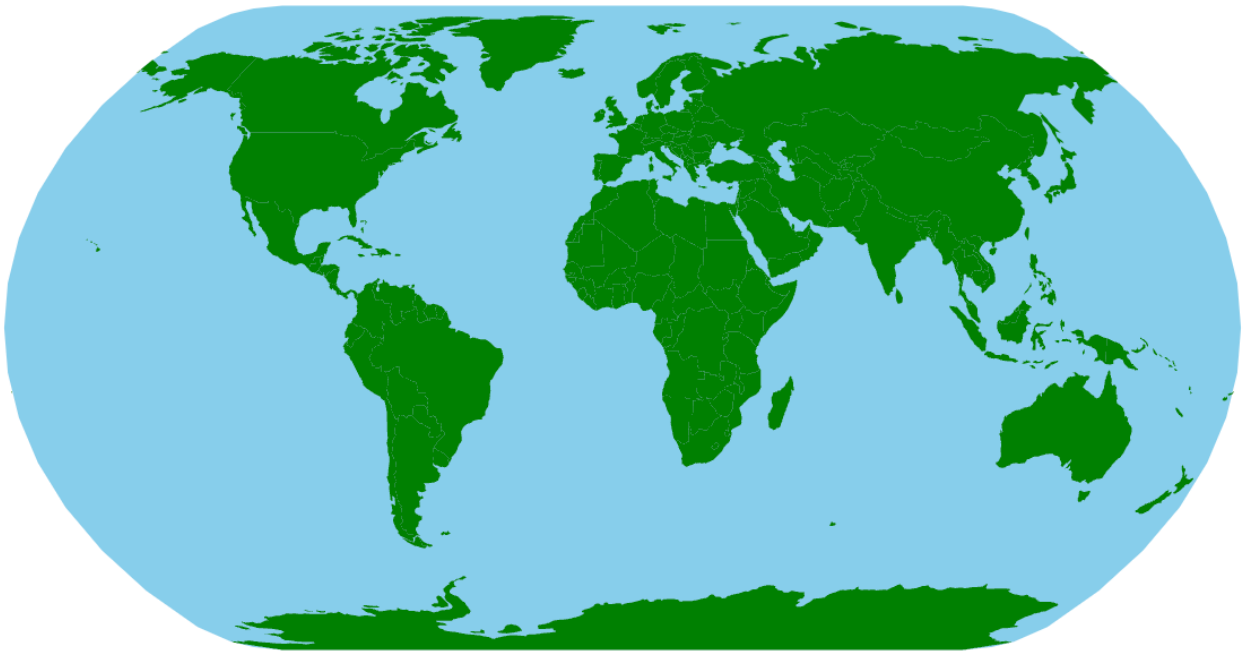
# 1. Animated path on Geojson

**Download lab8.html and worldData.**

You will see a map of the world. Suppose that you are taking a flight from NYC, US to New Delhi, India, with two stops at Rio de Janeiro, Brazil and Sydney, Australia. We will trace the the three flights on the map using paths and circles.



First, complete the definition `path` which refers to a <path> element and presents `routeData` with "red" color stroke (refer to the lecture exercise 9).

Then, define `totalLength` which calculates the total length of this path, in pixels. You will find the SVGGeometryElement.getTotalLength() method useful.

Notice that getTotalLength() exists under the SVGGeometryElement class, so you can only call this method on a SVGGeometryElement object; and `path` is **not**! `path` is a selection object from D3. `path.node()` will return a SVGGeometryElement object that corresponds to the <path> element we want to calculate the length of. You can always print path and path.node() to see what each shows.

**Question 1** *Submitted Jun 1st 2023 at 11:19:22 pm*

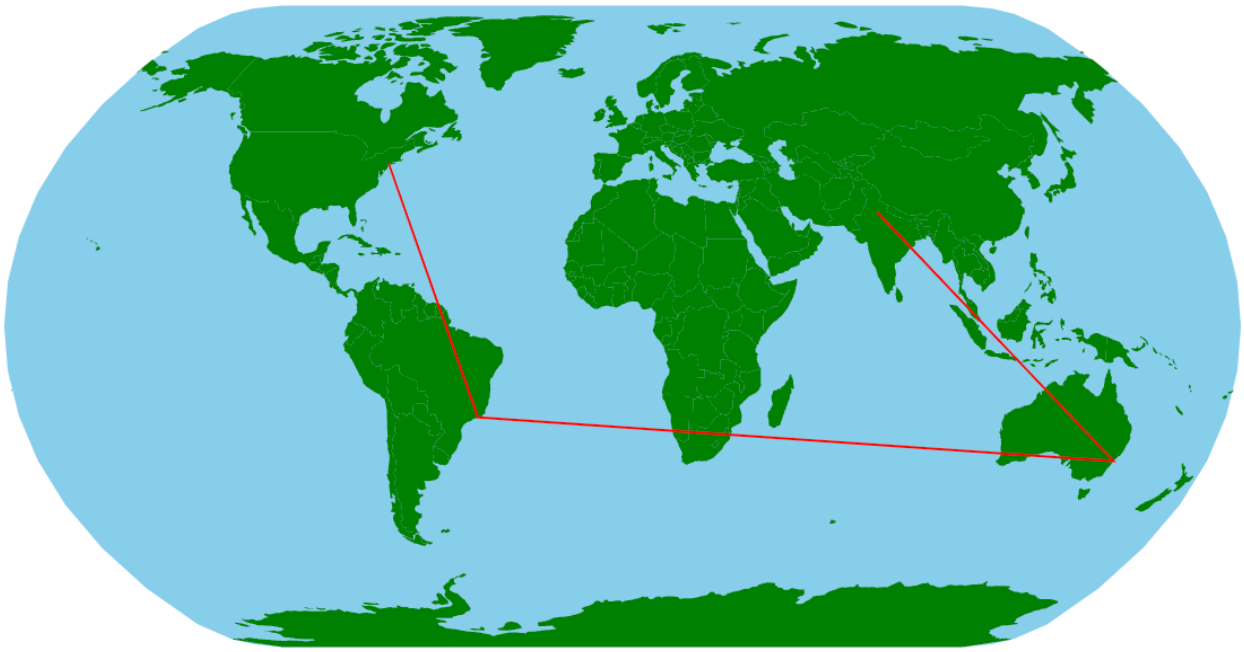
Copy paste your code below for the path definition and getTotalLength().

```
let path = svg.append("path")
```

```
.attr('class', 'route')

.attr('d', routeData)

.attr('fill', "none")

.attr("stroke", "red")

// Get totalLength of path. It should have roughly around 552.8

let totalLength = path.node().getTotalLength();
```

**Question 2** *Submitted Jun 1st 2023 at 11:20:22 pm*

You will see a path for our trip as follows:



Now, let's add a transition in the line. Use the path's length to set the `stroke-dasharray`, setting the initial `stroke-dashoffset` to the length of the path and then, in the transition, changing it to 0.

Basically, we want to draw a path shifted by a stroke-dashoffset (offset) of totalLength initially, from which we slowly (using the transition() method) shift towards a offset of 0. You can refer to the following links to understand the usage of `stroke-dasharray`, `stroke-dashoffset`, and `transition()`.

Make sure to use d3.easeLinear for the transition, and transitionDuration as the duration. Copy paste the code for the transition below:

```
path.attr("stroke-dasharray", `${totalLength} ${totalLength}`)

.attr("stroke-dashoffset", totalLength)

.transition()

.ease(d3.easeLinear)

.duration(transitionDuration)

.attr("stroke-dashoffset", 0);
```

## 2. Animated circle tracing path

You can now see the red line indicating our flight paths. We now want to track the path using a circle. We start by drawing a circle at the initial location (i.e. NYC) using transform to translate the circle to the first point in route.

**Question 1** *Submitted Jun 1st 2023 at 11:20:51 pm*

Paste your code for the circle at the initial location:

```
const circle = svg.append('circle') .attr('fill', 'red') .attr('r', 5) .attr('transform',
`translate(${route[0].x}, ${route[0].y})`);
```

**Question 2** *Submitted Jun 1st 2023 at 11:21:48 pm*

Next, we define the translate function for the circle. This function returns an attrTween for translating along the specified path element. Look at the following function, understand it's working and paste it in the code for lab8.html.

```
// Define the translate function for the circle
function translateAlong(path) {
    const length = path.getTotalLength();
    return function() {
    return function(t) {
        const {x, y} = path.getPointAtLength(t * length);
        return `translate(${x},${y})`;
    }
    }
}
```

You can now create an animation for transitioning the circle using attrTween. Make sure to use transitionDuration as the duration and d3.easeLinear. Copy paste your code below for the transition of the circle.

```
circle.transition() .ease(d3.easeLinear) .duration(transitionDuration) .attrTween('transform',
translateAlong(path.node()));
```

## 3. (Bonus) Adding multiple paths

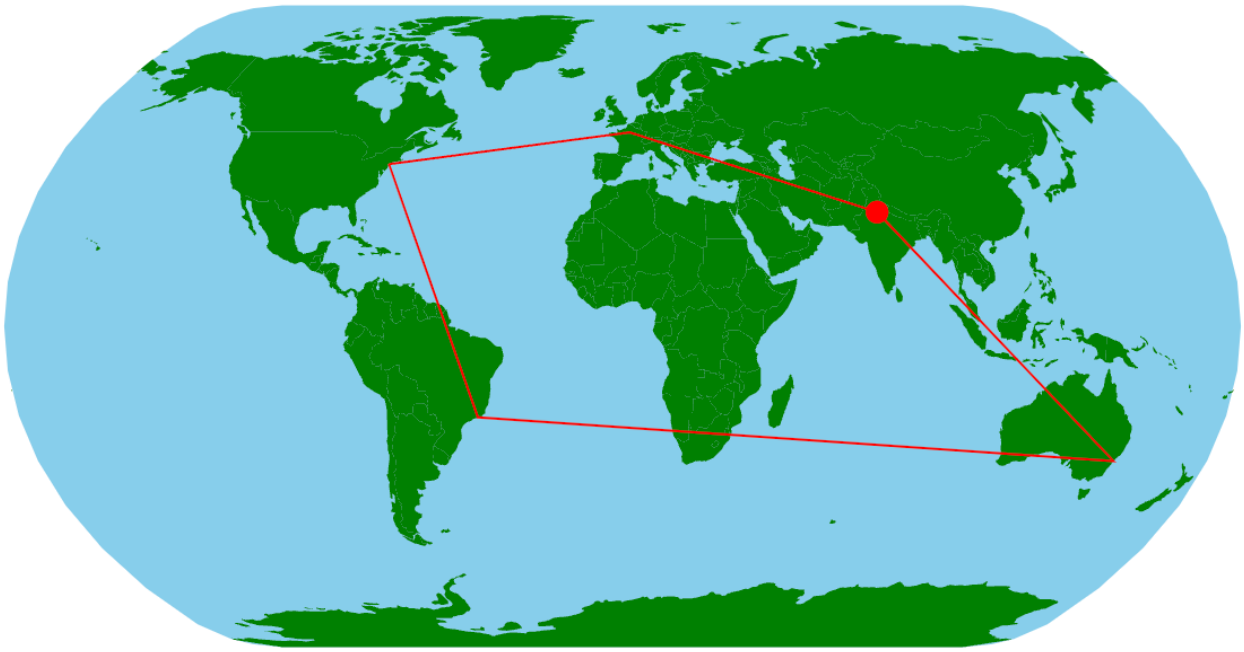
**Question** *Submitted Jun 1st 2023 at 11:22:47 pm*

Now, we will add another flight path from NYC, US to Paris, France () to New Delhi, India. Add the following route2 for this question.

```
// NYC, Paris, Delhi
const route2 = [{x: -73.935242, y: 40.730610}, {x: 2.3522,y: 48.8566}, {x: 77.1025, y: 28.7041}]
```

Now, add your code for another potential flight tracker on the same map for the new route.

The animation should end at the following snippet:



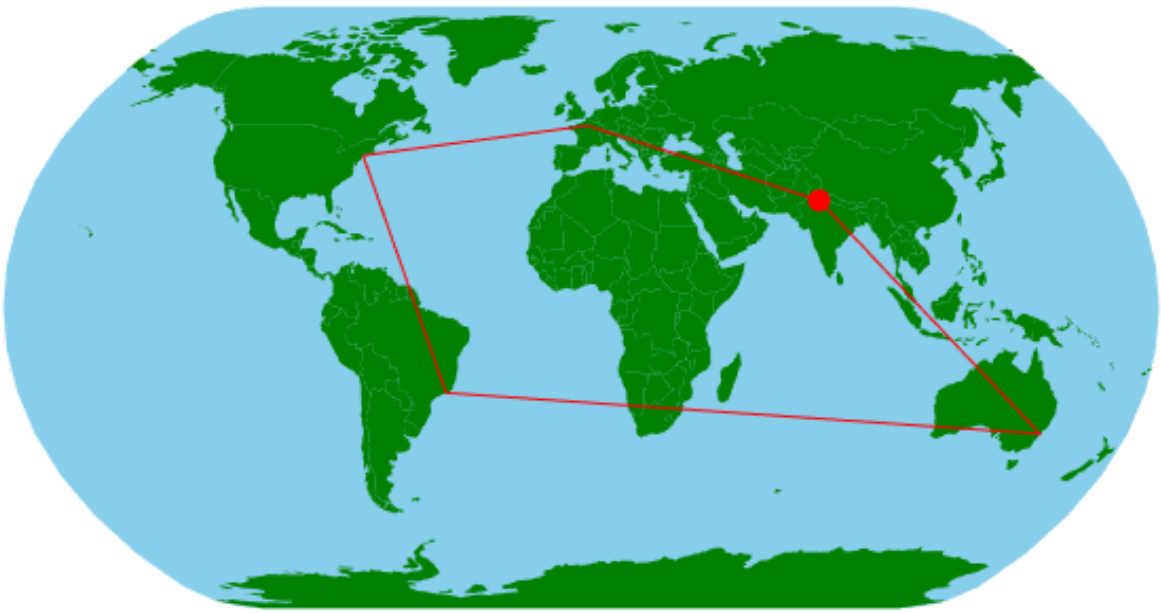
const route2 = [{x: -73.935242, y: 40.730610}, {x: 2.3522,y: 48.8566}, {x: 77.1025, y: 28.7041}] // NYC, Paris, Delhiconst routeProjected2 = []; for (i in route2){ routeProjected2.push(projection([route2[i].x, route2[i].y])); } const lineGenerator2 = d3.line(); const routeData2 = lineGenerator2(routeProjected2); // Define the path for the points in routeDatalet path2 = svg.append("path") .attr('class', 'route2') .attr('d', routeData2) .attr('fill', "none") .attr("stroke", "red") // Get totalLength of pathlet totalLength2 = path2.node().getTotalLength(); // Transition the line path2.attr("stroke-dasharray", totalLength2 + " " + totalLength2) .attr("stroke-dashoffset", totalLength2) .transition() .ease(d3.easeLinear) .duration(transitionDuration) .attr("stroke-dashoffset", 0); // Draw circle at initial locationconst circle2 = svg.append('circle') .attr('fill', 'red') .attr('r', 5) .attr('transform', `translate($route2[0].x$, {route2[0].y})`); // Animate the transition of the circle circle2.transition() .ease(d3.easeLinear)

```
.duration(transitionDuration) .attrTween('transform', translateAlong(path2.node()));
```

# Upload Your Files

**Question 1** *Submitted Jun 1st 2023 at 11:22:57 pm*

Upload the screenshot of your resulting webpage. You will need to click the "clip" button to upload a file into the Answer box.

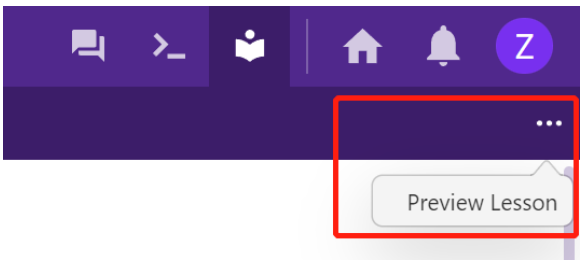


**Question 2** *Submitted Jun 1st 2023 at 11:22:59 pm*

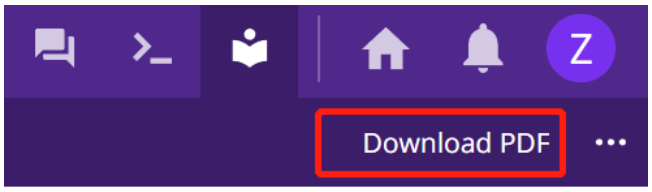
You need to download the PDF of lab 8 and upload it with other files to the Gradescope. Follow the

instructions on how to download PDF file:

1. Click on the ellipsis button and the Preview Lesson.




2. After that, click on the Download PDF button.




- (●) PDF downloaded!
- ( ) Haven't done yet!

**Question 3** *Submitted Jun 1st 2023 at 11:23:00 pm*

Upload the following files to Gradescope. You need to make **a group submission,adding all present members in your team**, so that the present members get the participation credit.

Files to upload:

- lab8.html
- PDF you downloaded as Q2

- (●) Our team uploaded the the files on gradescope!
- ( ) Oops, our team did not upload the files on gradescope!

# Feedback

**Question** *Submitted Jun 1st 2023 at 11:23:02 pm*

Was the activity today clear? If not, please share how the course can improve it. Your comments will help us design future lab content (and also future students).

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