CS320 Assignment 3: Functional Programming & Underscore

Instructor: Xinghui Zhao   Due: 11:59pm on 9/21/2018

1 Introduction

In this assignment, you use the Underscore library (`https://underscorejs.org`) to program several functions to process the wsudgrs dataset (`https://xinghuizhao.github.io/wsudata/wsudgrs.js`). **Note you can NOT use loops or if statements in any of the functions, otherwise you will lose points for them.**

2 Environment Setup

Follow the instructions below:

1. Set up JSfiddle with Underscore, use the latest version 1.8.3. See the figure below.
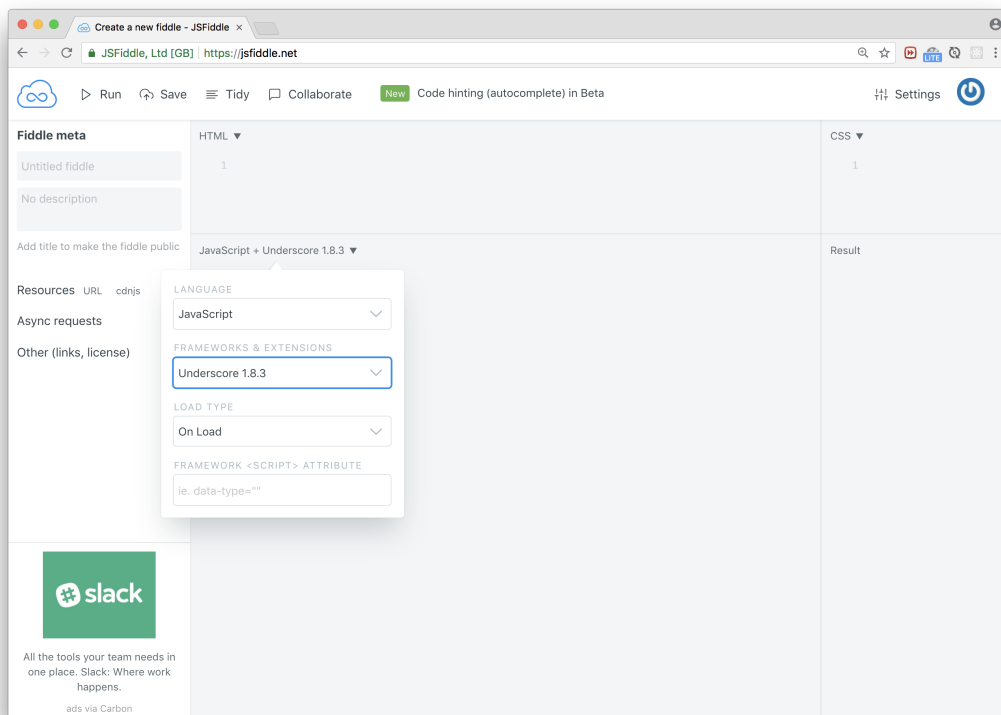

Figure 1: Setup JSfiddle with Underscore

2. To verify that Underscore is available in your JSfiddle, invoke an underscore function and log the output to the console. Note that here you need to bring up the console via "View-

>Developer->Javascript Console" (you must use Chrome browser to use this tool). See the figure below:
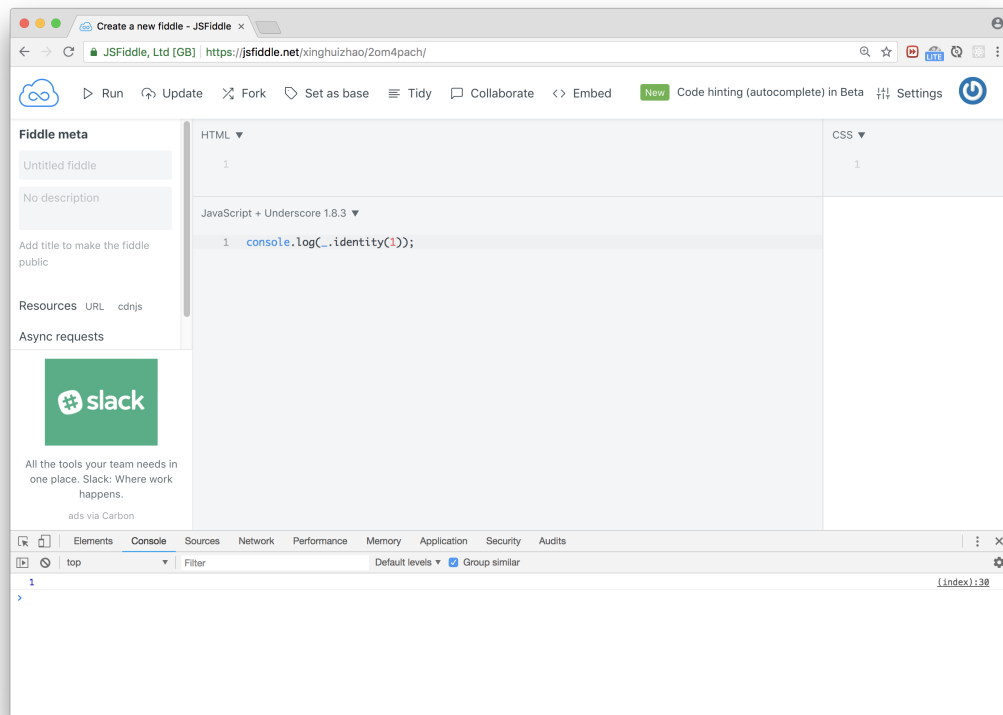

Figure 2: Verify Underscore

3 Load the Dataset

To making things easier, I have extracted the last 10 years of degree data from WSU's dataset, and created a js file to represent the data, which can be found here: `https://xinghuizhao.github.io/wsudata/wsudgrs.js`. This file defines "wsudgrs", which is an array of objects, each representing a data entry. The first couple of rows look like this:

```
const wsudgrs = [
  {
    "FISCAL_YEAR":2007,
    "CAMPUS":"Pullman",
    "Level":"Bachelors",
    "AWARDS":3515
  },
  {
    "FISCAL_YEAR":2008,
    "CAMPUS":"Pullman",
    "Level":"Bachelors",
    "AWARDS":3481
  },
  {
    "FISCAL_YEAR":2009,
    "CAMPUS":"Pullman",
    "Level":"Bachelors",
    "AWARDS":3409
  },
```

Figure 3: wsudgrs Data Samples

To load this data into JSFiddle, you need to specify it as an "External Resource". Click on the "URL" on the left side of the window, enter https://xinghuizhao.github.io/wsudata/wsudgrs.js, and click the + icon to save it, see below:
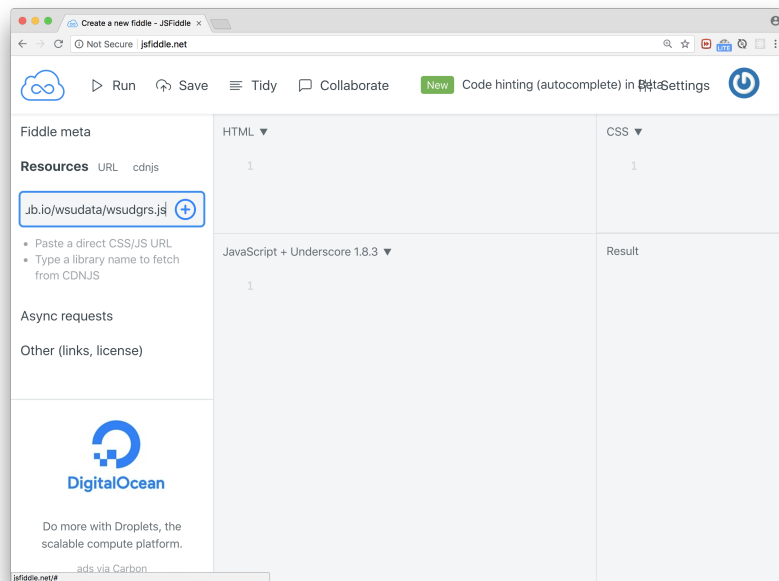

Figure 4: Load WSU Dataset

To test that the dataset is defined correctly, try printing out its length to the console. You should get a length of 178, as shown in Figure 5.

4   Data Processing

Using the Underscore library, implement the following functions to process the wsudgrs dataset:

1) totalDegrees(data):   This function is passed a data structure like wsudgrs and returns the total number of degrees awarded in the data set.

2) percentagePhD(data):   This function is passed a data structure like wsudgrs and returns the percentage of degrees that were awarded to PhD students. Such students are indicated by the string "Doctoral" in the "Level" field.

3) totalDegreesByYear(data, year):   This function can be passed wsudgrs and a year and returns the total number of degrees awarded in that year.

4) listCampuses(data):   This function can be passed wsudgrs and returns an array containing all the campuses referenced in the dataset.

5) listCampusDegrees(data):   This function can be passed wsudgrs and returns an object where the property keys are campuses and the values are the number of degrees awarded by the campus.
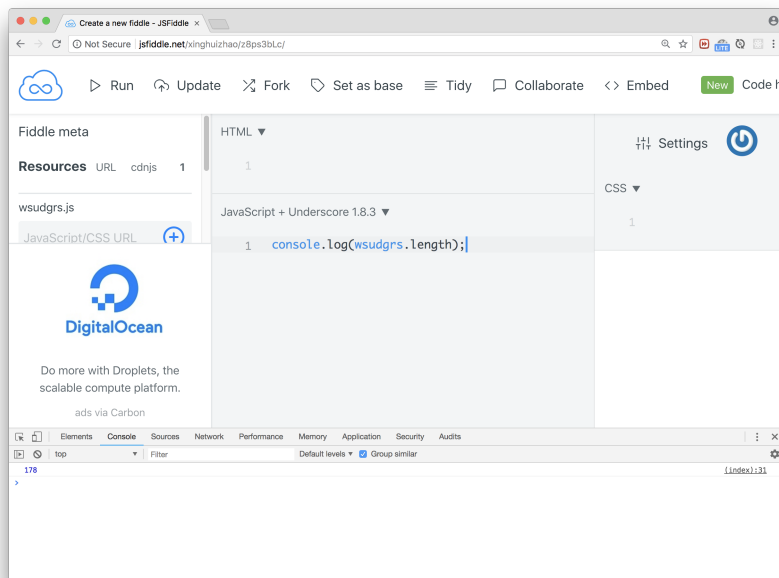
Figure 5: Verify WSU Dataset

6) maxDegrees(data): This function can be passed wsudgrs, computes the number of degrees earned in each year in the dataset, and then returns an integer which is the number of degrees earned in the year where the most degrees were earned.

5   Submission

This assignment is due at 11:59pm on 9/21/2018. Late submissions are subject to a 20% penalty. **Late submissions will not be accepted after 3 days past the deadline, in this case 11:59pm on 9/24.** Submit the following files in a package to Blackboard: a text file with URL for the fiddle.

6   Grading Scheme

This assignment will be graded out of 100. For your information, the grading scheme is shown in the following table.

Item	Percentage
Each function	15%
Code Readability	10%