Building Services for Consumption

Without knowing it, you have been writing Application Programming Interfaces -- commonly known as APIs -- to build services for others to consume your data:

- In MP4:
  - `/extract`, allows the extraction of a hidden “uiuc” GIF from a PNG image.

- In MP5:
  - `/:subject/:course`, returns the GPA and course credit information from the courses-microservice
  - `/scheduleGPA`, returns the GPA of a provided schedule

There are a lot of details in how to write a good API for others to use!

### HTTP-Based APIs

We will primarily focus on web-based APIs, as they are what are the most commonly used form of APIs in the cloud.

### RESTful APIs:

- [REST]:

Four Key Architectural Features:

- [Stateless]:

- [Client-Server]:

- [Explicit Caching]:

- [Layered System]:

Examples of widely-used APIs:
Non-RESTful APIs:
Many other APIs exist outside of the RESTful API space -- particularly any if the request requires state.

Example Service: MapReduce

Example Input:

<table>
<thead>
<tr>
<th>The</th>
<th>quick</th>
<th>brown</th>
<th>fox</th>
<th>jumps</th>
<th>over</th>
<th>the</th>
<th>lazy</th>
<th>dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0]</td>
<td>[1]</td>
<td>[2]</td>
<td>[3]</td>
<td>[4]</td>
<td>[5]</td>
<td>[6]</td>
<td>[7]</td>
<td>[8]</td>
</tr>
</tbody>
</table>

Map Function:

Reduce Function:

Example Input:

<table>
<thead>
<tr>
<th>admin2: Champaign</th>
<th>admin2: Champaign</th>
<th>admin2: Champaign</th>
<th>admin2: Champaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>country: US</td>
<td>country: US</td>
<td>country: Italy</td>
<td>country: Italy</td>
</tr>
<tr>
<td>cases: 6390</td>
<td>cases: 6285</td>
<td>cases: 18325</td>
<td>cases: 162968</td>
</tr>
<tr>
<td>date: 2020-10-29</td>
<td>date: 2020-10-28</td>
<td>date: 2020-10-28</td>
<td>date: 2020-10-28</td>
</tr>
</tbody>
</table>

Source:
https://github.com/CSSEGISandData/COVID-19/tree/master/csse_covid_19_data/csse_covid_19_daily_reports