

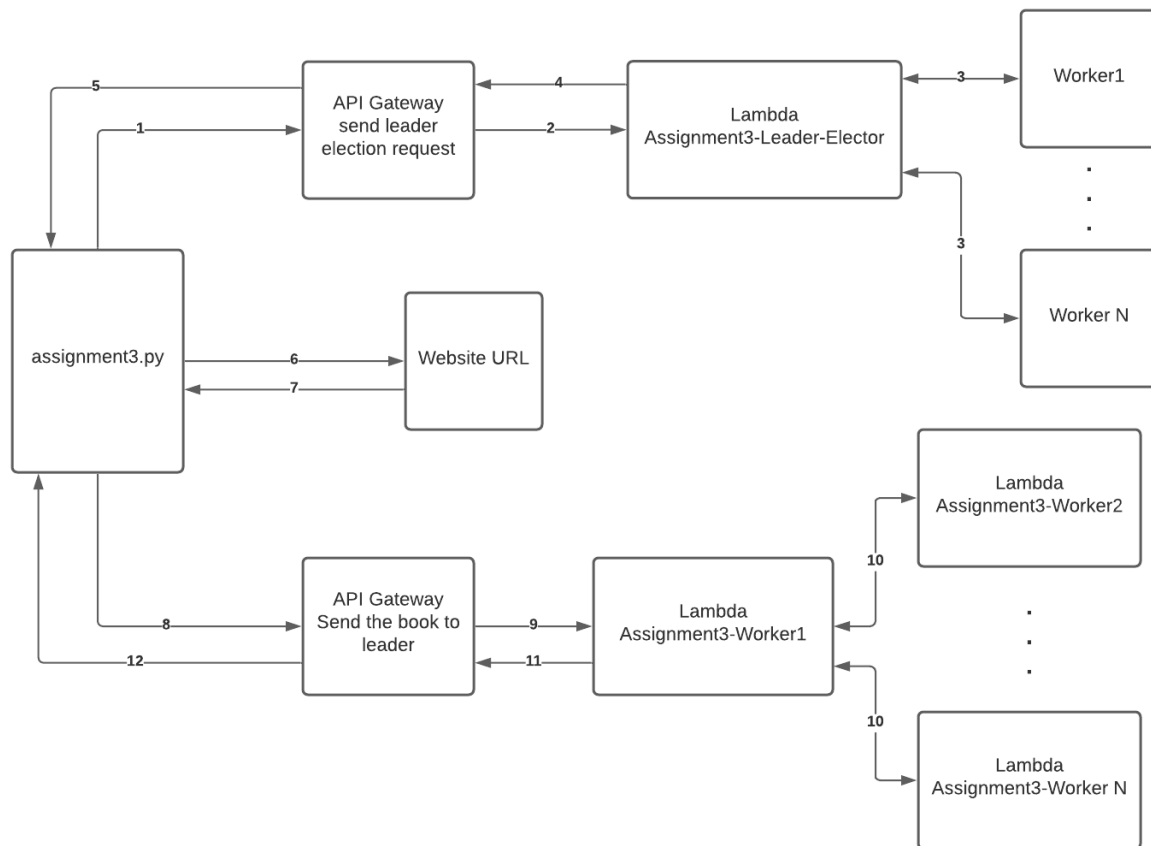
# Architecture

## Component

- Client (assignment3.py):
  - a. Init a request to LeaderElector Lambda function to elect a leader
  - b. Download the book content from URL
  - c. Send book content to the leader with all alive workers
- API Gateway : Get requests from user and trigger Lambda functions
- Lambda functions:
  - a. Leader Elector: Elect leader
  - b. Leader (Elected from alive workers)
    - Get the book content, divide it into parts and send it to workers.
    - Get the results from workers and send it back to client
  - c. Worker:
    - Response to isHealth request to indicate its availability.  
Use random number to simulate 90% availability rate
    - Count word frequency and return the result to leader

## Dataflow

(Assuming Worker 1 is the elected leader in this flowchart)



1. Send leader election request from client to API Gateway
2. API Gateway triggers Lambda Assignment3-Leader-Elector function
3. Assignment3-Leader-Elector function checks the healthiness of each worker. Elects a leader from the available workers
4. Return leader and all available workers information from Lambda Assignment3-Leader-Elector function to API Gateway
5. Return leader and all available workers information from API Gateway to client
6. Send HTTP Get request to download book from target URL
7. Return book content to client
8. Send book with leader and workers data to API Gateway

9. Send book with leader and workers data from from API Gateway to Leader
10. Leader divides the book into parts and distributes it to available workers. Available workers count the word frequency and return the results to leader
11. Leader gathers the results from workers and returns the aggregated result to API Gateway
12. API Gateway returns the result to client

## Instructions

First change your current directory into Assignment3

Run Command

```
python3 assignment3.py https://www.gutenberg.org/files/2591/2591-0.txt 50
```

You will get the following result

```
admins-iMac:assignment3 joyce$ python3 assignment3.py https://www.gutenberg.org/files/2591/2591-0.txt 50
1. Available Workers:
  - Assignment3-Worker-1
  - Assignment3-Worker-2
  - Assignment3-Worker-3
2. Leader:
  - Assignment3-Worker-3

3. Downloading book content from url...

4. Starts processing on Cloud

5. Processed in 6.198559999465942 seconds

6. Top 50 words:
[('the', 6506), ('and', 5250), ('to', 2707), ('a', 1932), ('he', 1817), ('of', 1450), ('was', 1337), ('in', 1080), ('she', 1049), ('that', 1021), ('his', 1014), ('you', 941), ('it', 881), ('her', 880), ('had', 827), ('I', 755), ('they', 751), ('for', 721), ('with', 720), ('as', 718), ('not', 684), ('said', 674), ('but', 651), ('on', 556), ('The', 552), ('at', 546), ('him', 544), ('will', 541), ('so', 527), ('all', 526), ('be', 522), ('into', 478), ('have', 475), ('Then', 450), ('is', 440), ('when', 432), ('went', 426), ('came', 424), ('little', 358), ('out', 348), ('were', 338), ('one', 329), ('up', 317), ('my', 308), ('by', 288), ('who', 286), ('I', 284), ('this', 267), ('me', 267), ('what', 264)]
```

## Git Repository

<https://github.com/joyce0216/CSYE6225/tree/main/Assignment3>