SENG3011 - D1

API-demic

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Describe how you intend to develop the API module and provide the ability to run it in Web service mode.

The API module will be developed with the REST architecture. REST architectures typically run on a web service, hence we will be calling data and resources over HTTP calls and using keywords like “GET”, “POST”, “PUT”, “DELETE”,

Our service has three main components.

- A web scraper that scrapes data from our source (https://crofsblogs.typepad.com/h5n1/) periodically.
- A relational database that stores the data scraped by the web scraper.
- A web API to query the database and return JSON.

We intend to run the service on a cloud computing provider.

Since it is web based, we also need to host it online. The most cost efficient and simple hosting service was either Heroku or DigitalOcean. We have decided to use Heroku since it provides university students with Student Tier.

Discuss your current thinking about how parameters can be passed to your module and how results are collected. Show an example of a possible interaction. (e.g.- sample HTTP calls with URL and parameters).

Parameters such as key_terms, period of interest or location can be passed into the module to return filtered disease reports specified in the parameters criteria. So when the parameters are passed into the api module, we would then scrape our information source in order to locate reports relating to these parameters. This could include reports related to certain diseases or reports released during a certain period of time.

Resource URL

GET */articles*

Query Parameters

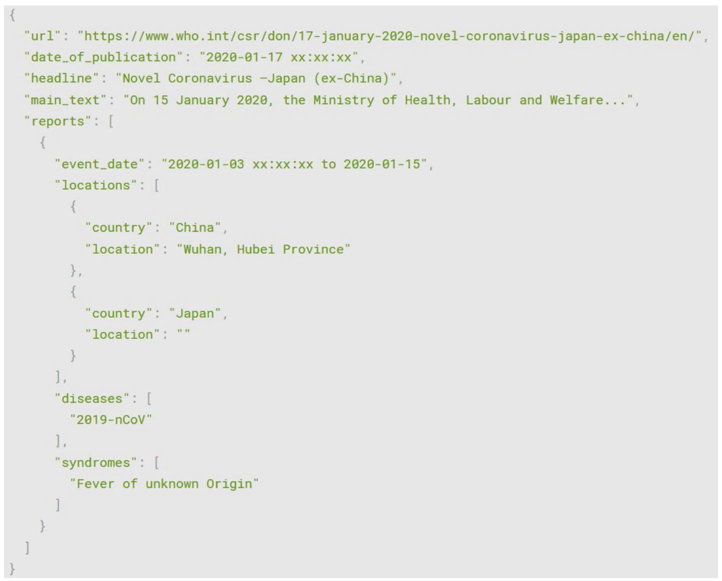
Parameter	**Type**	**Required**	**Description**	**Example**
start_date	datetime	✔	The start date used to filter the articles	2015-10-01T08:45:10
end_date	datetime	✔	The end date used to filter the articles	2015-11-01T19:37:12

key_terms	string		A comma separated list of key terms used to filter the articles	Anthrax,Zika
location	string		Used to filter the articles by location	Sydney

Example Request

- /articles?start_date=2015-10-01T08:45:10&end_date=2020-02-01T19:37:12&location=Sydney&key_term=Coronavirus
    - Get all articles related to Coronavirus in China published between the first of October 2015 at 08:45:10 and the first of February 2020 at 19:37:12

Example Response



```
{
  "url": "https://www.who.int/csr/don/17-january-2020-novel-coronavirus-japan-ex-china/en/",
  "date_of_publication": "2020-01-17 xx:xx:xx",
  "headline": "Novel Coronavirus –Japan (ex-China)",
  "main_text": "On 15 January 2020, the Ministry of Health, Labour and Welfare...",
  "reports": [
    {
      "event_date": "2020-01-03 xx:xx:xx to 2020-01-15",
      "locations": [
        {
          "country": "China",
          "location": "Wuhan, Hubei Province"
        },
        {
          "country": "Japan",
          "location": ""
        }
      ],
      "diseases": [
        "2019-nCoV"
      ],
      "syndromes": [
        "Fever of unknown Origin"
      ]
    }
  ]
}
```

Present and justify implementation language, development and deployment environment (e.g. Linux, Windows) and specific libraries that you plan to use.

Implementation Language:

The API will be implemented using Python. We decided to use Python because we all have experience with it. Other languages such as Java, Javascript and C# were suggested but the lack of comfortability meant that some members would have to invest time and resources to learn those languages.

Python contains a vast range of libraries, which will be useful when creating a web API and a web scraper. We decided to use Flask as our web framework because it's lightweight and allows for flexibility in parsing parameters and organising routing for our API. It also supports JSON formatting which was important when returning a response for our clients. The other choice was Django, which has a ready to use admin framework, however it is not necessary for us and will require us to put additional resources into learning.

We are also using Python for the web scraping component of our service. A combination of the Requests and BeautifulSoup libraries will be used to scrape and parse our HTML source.

To store our data we have chosen to use a relational database system, PostgreSQL. We chose to use a relational database over a non-relational database like MongoDB so that we can form complex queries based on multiple properties of an object. We specifically chose PostgreSQL over other relational database systems because of its flexibility with custom data types, large amount of native data types and because we all have experience with it.

Python libraries:

- Flask: Rest-API framework
- BeautifulSoup4: HTML Parser
- Requests: HTTP Library

Development environment:

- Windows
- Mac

Deployment environment:

- Ubuntu 18.04