

Question 3

System Design

Location Extraction from Article

Article 1

Click the button below to extract the location.

SINGAPORE, 23 November 2021: Scoot joins other Singapore and Kuala Lumpur-based airlines flying the Vaccinated Travel Lane by announcing a four-times-weekly service starting 29 November. Scoot's designated VTL flights, TR472/TR473 between Singapore, Changi Airport and KL, KLIA2, will be operated by Scoot's Boeing 787 Dreamliners, promising the added widebody comfort in both economy and ScootPlus cabins. Scoot will also be operating seven non-designated VTL flights between Singapore and Kuala Lumpur on Scoot's Airbus A320 aircraft to provide for transit passengers connecting to and from Scoot's network via Singapore. In addition, Scoot is planning to resume flights to Langkawi from 3 December as part of the island's air travel bubble arrangement, providing quarantine-free travel to foreign visitors, subject to each country's requirements. From early December, the airline will increase flights to Ipoh from the current five-times weekly to daily and add a third frequency to Kuching, subject to regulatory approvals. Scoot currently also operates daily services between Singapore and Penang. The commencement of VTL flights between Singapore and KL adds to Scoot's existing VTL routes between Singapore and Australia, Berlin, South Korea, and effective 6 December 2021, Jeddah. Travellers should always check prevailing eligibility and entry requirements to Singapore and Malaysia before booking VTL flights.

Extract locations from article above

Article 2

Click the button below to extract the location.

KUALA LUMPUR, March 20 — Facing a police investigation over the now cancelled "Jom Ziarah Gereja" programme, Youth and

Figure 1: User Interface Wireframe using Streamlit

We shall design and develop a **webpage** or other user interface like the wireframe shown above. This allows the users to extract the locations from the selected article by clicking onto the button labelled 'Extract locations from article above'.

The webpage shall be scrollable and contain a series of articles stored in our database so that the users can choose their desired article to perform the extraction.

When **the user clicks onto the button**, the button should call an API from backend and send a respective JSON request that includes but not limited to several aspects as below:

- user_id or user_token
- article_id

In backend, the relational database such as MySQL can be used to store the NEWS_ARTICLE_TABLE. There is a respective **backend method belonging to the API** called from frontend, for example, extract_locations. In the backend method, we can

- first, authenticate the user to see if the user has the access to perform the extraction;
- second, use a database connector to connect to NEWS_ARTICLE TABLE to retrieve the article content based on the article_id;
- third, process the article content by using the location extraction component developed;
- lastly, return the extracted locations with their respective indices in JSON format, and a 'success' response to frontend

Once the frontend has received the asynchronous/await response from backend, the extracted locations and their indices are being processed. Since we have the indices of the locations, we can add some text effects onto the respective location from the article content, such as bold the locations.

Location Extraction from Article

Article 1

We have emboldened the locations extracted in article below. Please check it out!

SINGAPORE, 23 November 2021: Scoot joins other Singapore and Kuala Lumpur-based airlines flying the Vaccinated Travel Lane by announcing a four-times-weekly service starting 29 November. Scoot's designated VTL flights, TR472/TR473 between **Singapore**, **Changi Airport** and **KL, KLIA2**, will be operated by Scoot's Boeing 787 Dreamliners, promising the added widebody comfort in both economy and ScootPlus cabins. Scoot will also be operating seven non-designated VTL flights between **Singapore** and **Kuala Lumpur** on Scoot's Airbus A320 aircraft to provide for transit passengers connecting to and from Scoot's network via **Singapore**. In addition, Scoot is planning to resume flights to **Langkawi** from 3 December as part of the island's air travel bubble arrangement, providing quarantine-free travel to foreign visitors, subject to each country's requirements. From early December, the airline will increase flights to **Ipoh** from the current five-times weekly to daily and add a third frequency to **Kuching**, subject to regulatory approvals. Scoot currently also operates daily services between **Singapore** and **Penang**. The commencement of VTL flights between **Singapore** and **KL** adds to Scoot's existing VTL routes between **Singapore** and **Australia, Berlin, South Korea**, and effective 6 December 2021, **Jeddah**. Travellers should always check prevailing eligibility and entry requirements to **Singapore** and **Malaysia** before booking VTL flights.

Article 2

Click the button below to extract the locations from the article.

KUALA LUMPUR, March 20 — Facing a police investigation over the now cancelled "Jom Ziarah Gereja" programme, Youth and Sports Minister Hannah Yeoh has called for a stop to allegations that threaten national harmony. Speaking to the press before entering the Sentul police headquarters to give her statement today, Yeoh said that she would be giving her full cooperation to the

Figure 2: User Interface after Extracting Locations

People always love to see the results in a quick and simple manner.

The **user-friendliness and simplicity** of our webpage function can help the users to get to know the locations from article easily and rapidly.

Caching mechanisms shall be implemented to improve webpage performance and reduce load on the database. The cache can be cleared after a specified period or when there are new changes on the NEWS_ARTICLE table.

Responsiveness on devices is important so that our webpage can be displayed nicely in different devices such as desktop, tablet, mobile phone, and laptop.

User Acceptance Test

Lastly, **user acceptance test** shall be carried out such as A/B testing.

There are a few elements or features that can be tested such as the headline, the article, the 'call-to-action' (CTA) button a.k.a. 'Extract locations from article above' button and the results.

Some metrics that we can use to evaluate the test results:

- Session duration: How long a user spends on the webpage
- Conversion rate: How many users click the CTA button per hour
- Bounce rate: How many users leave the webpage without perform any actions
- Click-through rate: How many clicks received on CTA button per hour

User Engagement

Interactions with users are crucial to enhance the user engagement on the component that we want to productize. One of the approaches to achieve that is to **provide an upload button**, to allow the users to upload their documents and use our location extraction component to get the predicted locations.

The system workflow is illustrated as below:

