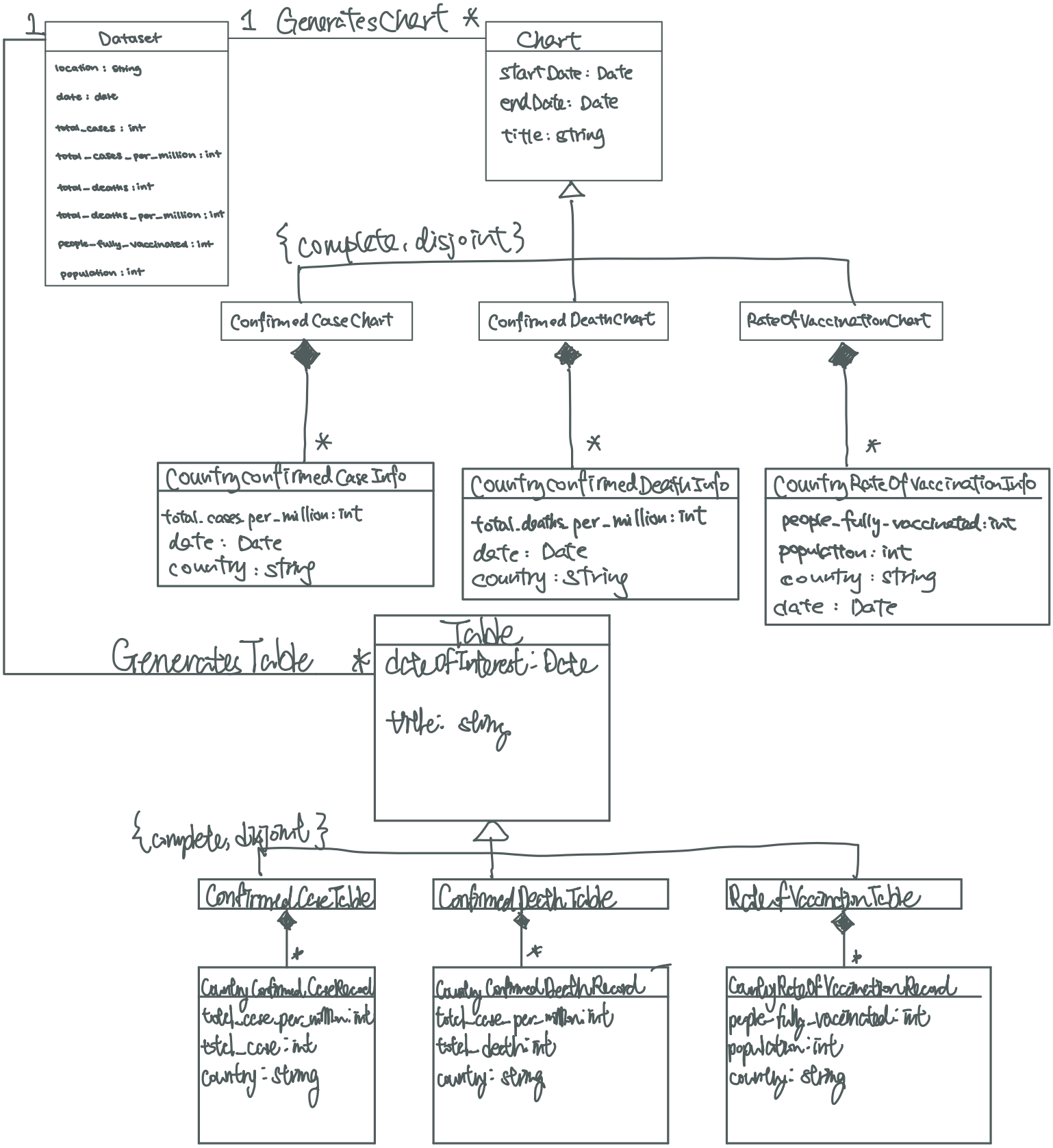
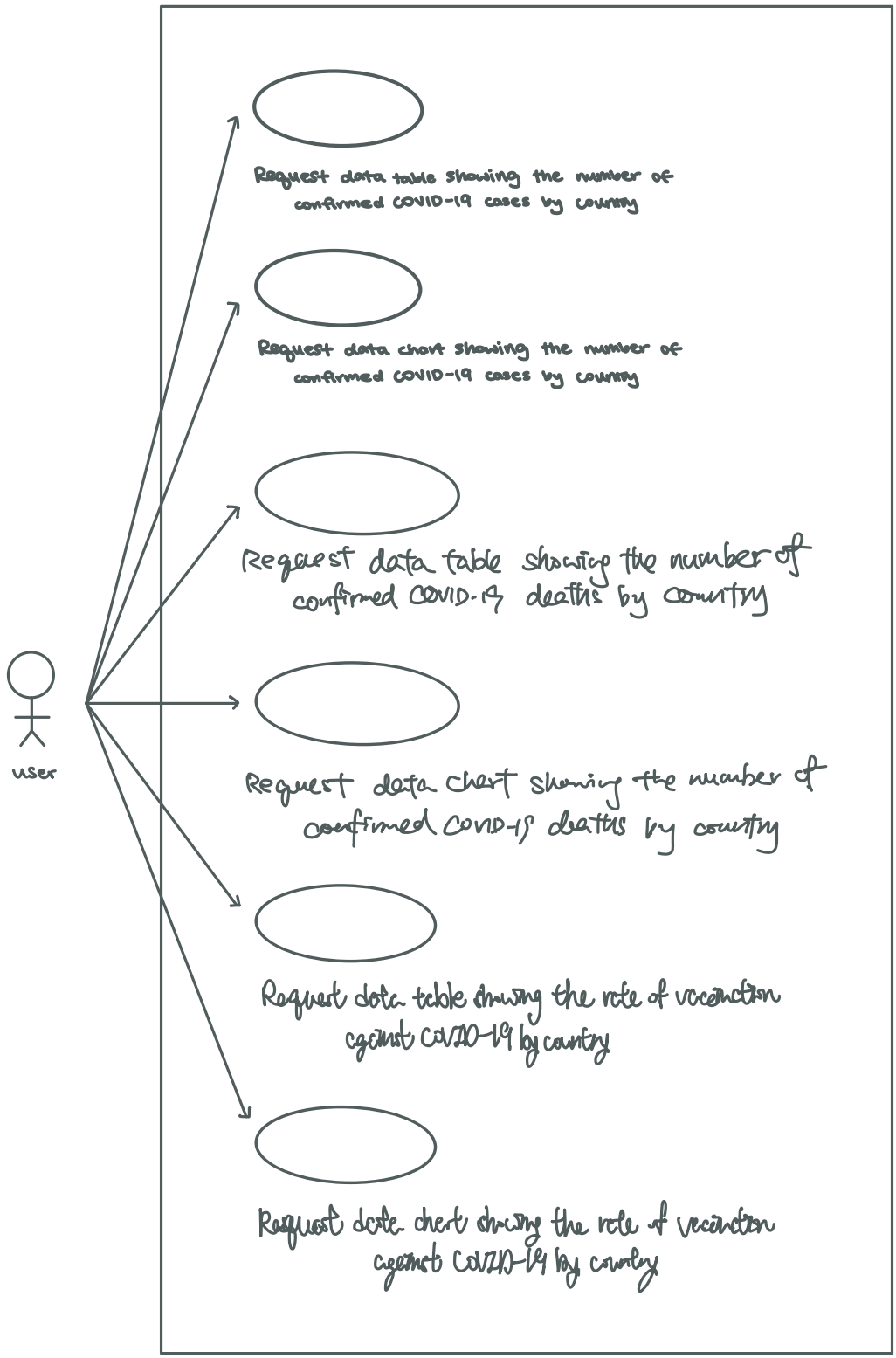
Class Diagram



Use-case Diagram

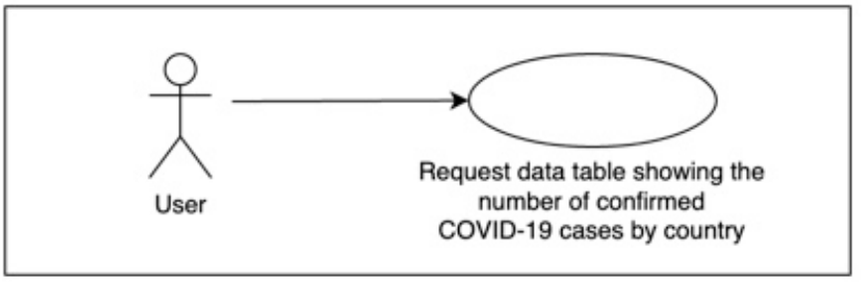


Use Case: Request data table showing the number of confirmed COVID-19 cases by country

Brief Description

This use case describes how a user can request a data table showing the number of confirmed COVID-19 cases by country from a given dataset.

Use-case Diagram



Basic Flow

1. The use case begins when the User actor chooses to request a data table showing the number of confirmed COVID-19 cases by country.
2. The system displays the interface for selecting the filter criteria.

{Enter Date of Interest}

3. The User indicates the date of interest for the data they would like to request.

{Enter Countries of Interest}

4. The User indicates the countries of interest from a list of countries for the data they would like to request.

{Create Table}

5. The system labels the data table with the title "Number of Confirmed COVID-19 Cases as of [Date of Interest]"
6. The system creates three columns with headings "Country", "Total Cases", and "Total Cases (per 1M)"
7. For each country selected by the User

   {Display Country}

   7.1. The system displays the country in the “Country” column

   {Display Number of Total Cases}

   7.2. The system retrieves and displays the number of total confirmed COVID-19 cases for that country and date of interest in the “Total Cases” column

   {Display Number of Total Cases Per Million}

   7.3. The system retrieves and displays the number of total confirmed COVID-19 cases per million for that country and date of interest in the “Total Cases (per 1M)” column
8. The use case ends.

Alternative Flows

A1: Invalid Date of Interest

At **{Create Table}** if the entered date of interest is invalid (i.e., if the field is left empty or if the date does not exist in the dataset),

1. The system informs the User that the date is invalid.
2. The flow of events is resumed at **{Enter Date of Interest}.**

A2: Invalid Countries of Interest

At **{Create Table}** if the selected countries of interest is invalid (i.e. if no country is selected),

1. The system informs the User that the selected countries of interest is invalid,
2. The flow of events is resumed at **{Enter Countries of Interest}.**

A3: Missing Total Cases Field in Dataset

At **{Display Number of Total Cases}** if the total number of confirmed COVID-19 cases for the currently iterated country of interest and selected date of interest is missing/empty in the given dataset,

1. If the field for the number of Total Cases Per 1M is not missing,
   1.1. The system multiplies the value in the number of Total Cases Per 1M field by 1M and puts it into the field for the number of Total Cases.
   1.2. The flow of events is resumed at **{Display Number of Total Cases Per Million}.**
2. If the field for the number of Total Cases Per 1M is also missing,
   2.1. The system inserts blank fields into the "Total Cases" and "Total Cases (Per 1M)" columns.
   2.2. The flow of events is resumed at **{Display Country}** for the next iteration in the for loop.

A4: Missing Total Cases Per 1M Field in Dataset

At **{Display Number of Total Cases Per Million}** if the total number of confirmed COVID-19 cases per million for the currently iterated country of interest and selected date of interest is missing/empty in the given dataset,

1. The system inserts a blank field into the "Total Cases (Per 1M)" column.
2. The flow of events is resumed at **{Display Country}** for the next iteration in the for loop.

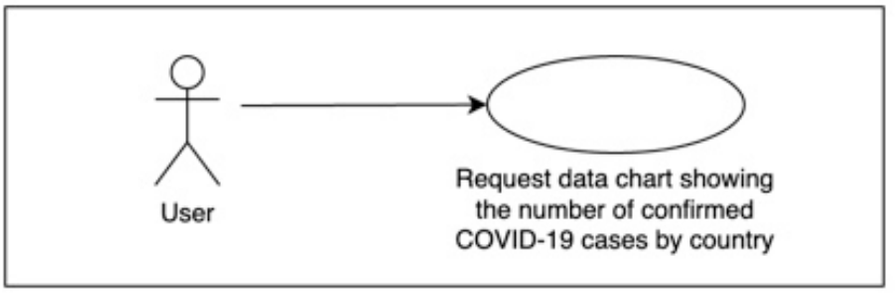
A2

Use Case: Request data chart showing the number of confirmed COVID-19 cases per million by country

Brief Description

This use case describes how a user can request a data chart showing the number of confirmed COVID-19 cases per million by country from a given dataset.

Use-case Diagram



Basic Flow

1. The use case begins when the User actor chooses to request a data chart showing the number of confirmed COVID-19 cases per million by country.
2. The system displays the interface for selecting the filter criteria.

{Enter Period of Interest}

3. The User indicates the period of interest (from [start date] to [end date]) for the data they would like to request.

{Enter Countries of Interest}

4. The User indicates the countries of interest from a list of countries for the data they would like to request.

{Create Chart}

5. The system labels the data chart with the title "Cumulative Confirmed COVID-19 Cases (per 1M)”
6. The system labels the x-axis with the scale of appropriate dates and the y-axis with the scale of appropriate number of confirmed COVID-19 cases per million.
7. For each country selected by the User

   {Display Curve}

   7.1. The system retrieves and displays a coloured cumulative curve of the number of confirmed COVID-19 cases per million for that country and requested period of interest

   {Display Country}

   7.2. The system labels the curve by the name of its respective country
8. The use case ends.

Alternative Flows

A1: Invalid Period of Interest

At **{Create Table}** if the entered period of interest is invalid (i.e., if the field is left empty, or if at least one of the dates do not exist in the dataset, or if the end date is before the start date),

1. The system informs the User that the period of interest is invalid.
2. The flow of events is resumed at **{Enter Period of Interest}.**

A2: Invalid Countries of Interest

At **{Create Table}** if the selected countries of interest is invalid (i.e. if no country is selected),

1. The system informs the User that the selected countries of interest is invalid,
2. The flow of events is resumed at **{Enter Countries of Interest}.**

A3: Unable to Create Curve

At **{Display Curve}** if the curve cannot be created (due to missing Total Cases Per 1M field for the currently iterated country for some date during the period of interest from the dataset),

1. The system informs the User that the curve for the currently iterated country is unavailable.
2. The flow of events is resumed at **{Display Curve}** for the next iteration of the for loop.

B1

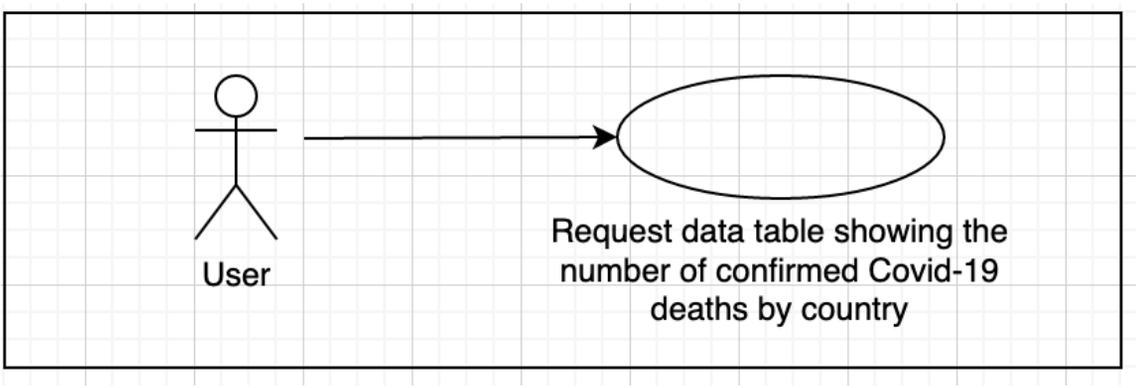
Use Case Specification of Task B1

Use Case: Request data table showing the number of confirmed Covid-19 deaths by country

Brief Description

This use case describes how a user can request the data table showing number of confirmed Covid-19 deaths by country through the system.

Use-case Diagram



Basic Flow

1. The use case begins when the User actor chooses to select the tab with generating table of deaths count.

{File Exists}

2. The system displays the interface for inputting date of interest and countries of interest.

{Enter date of interest and countries}

3. The User select the date of interest and the countries of interest. Then press a button to inform the system for generating the table.

{Input Validation}

{Data error}

4. The system displays the table showing the number of confirmed Covid-19 death cases as of date of interest by country. Including total deaths and total deaths (per 1M) for each country.
5. The use case ends.

Alternative Flows

A1: Invalid Input

At {Input Validation} if the entered date of interest or countries of interest is invalid.

1. The system informs the user that the date of interest or countries of interest is invalid.
2. The flow of events is resumed at {Enter date of interest and countries}

A2: Missing data file

At {File Exists} if the data file cannot be accessed by system.

1. The system informs the user that the data file is missing and reject the request.
2. The use case ends.

A3: Incomplete Data
At {Data error} if there exists a data missing in the data file that the date and country match with the user's input.

1. The system informs the user that the data for which countries are missing.
2. The system displays the table showing the number of confirmed Covid-19 death cases as of date of interest by country. Including total deaths and total deaths (per 1M) for each country. For those data missing from the data file, it will be a blank.
3. The use case ends.

B2

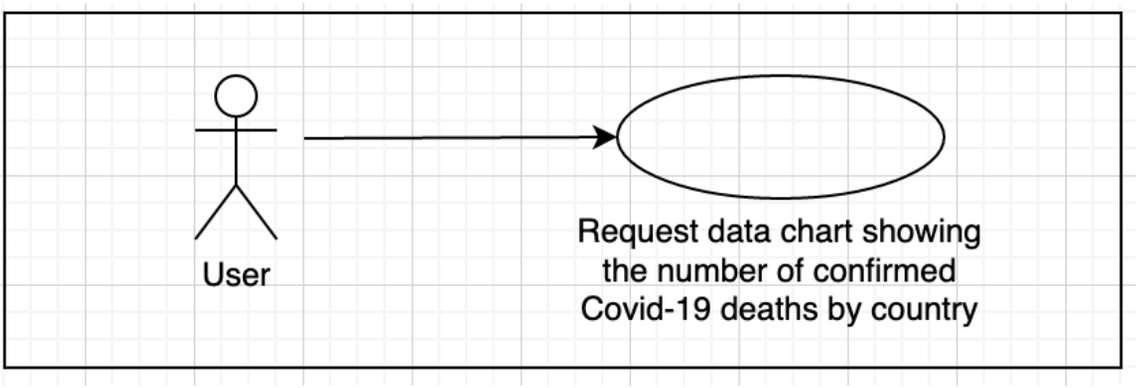
Use Case Specification of Task B2

Use Case: Request data chart showing the number of confirmed Covid-19 deaths by country

Brief Description

This use case describes how a user can request the data chart showing number of confirmed Covid-19 deaths by country through the system.

Use-case Diagram



Basic Flow

1. The use case begins when the User actor chooses to select the tab with generating chart of deaths count.

{File Exists}

2. The system displays the interface for inputting date of interest and countries of interest.

{Enter period of interest and countries}

3. The User select the period of interest and the countries of interest. Then press a button to inform the system for generating the chart.

{Input Validation}

{Data error}

4. The system displays the chart showing the curve of confirmed death cases during the period of interest by country in terms of total deaths (per 1M).
5. The use case ends

Alternative Flows

A1: Invalid Input

At {Input Validation} if the entered period of interest or countries of interest is invalid.

3. The system informs the user that the period of interest or countries of interest is invalid

The flow of events is resumed at {Enter period of interest and countries}

A2: Missing data file

At {File Exists} if the data file cannot be accessed by system.

1. The system informs the user that the data file is missing. Reject the request.

2. The use case ends.

A3: Incomplete Data
At {Data error} if there exists a data missing in the data file that the date and country match with the user's input.

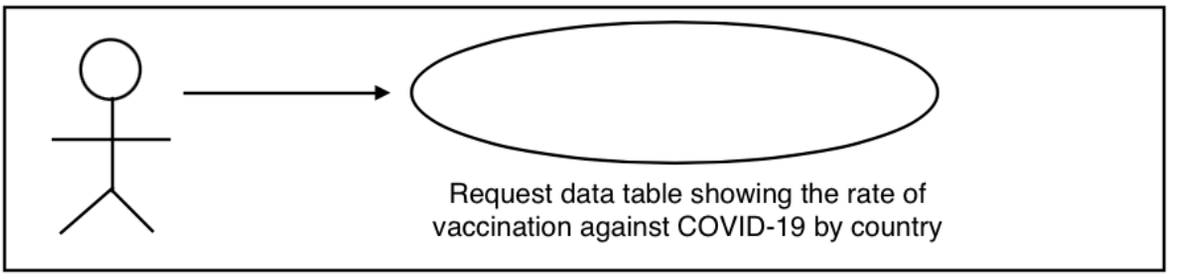
1. The system informs the user that the data for which countries and on which days are missing and reject the request.
2. The use case ends.

Use Case: Generate data table showing the rate of vaccination against COVID-19 by country

Brief Description:

This use case describes how a user generates a table showing the rate of vaccination against COVID-19 by country

Use-case diagram:



Basic Flow:

1. The use case begins when the user chooses to generate Table C.
2. The system displays the interface for entering required information for generating Table C.

{Enter Term}

3. The user specifies the date of interest and countries of interest which would be shown onto the table generated.

{Confirm Creating Table}

4. The user confirms to generate Table C.
5. The system retrieves data ("country", "people_fully_vaccinated", "population", "date") from the dataset.
6. The system calculates the rate of vaccination by dividing the "people_fully_vaccinated" by "population".

{Display Table}

7. The system generates and displays the table.
8. The use case ends.

Alternative Flows:

1. Invalid Term
   At {Confirm Creating Table} if the entered data of interest is invalid,
   a. The system informs the user that the entered data of interest is invalid.
   b. The flow of events is resumed at {Enter Term}.
2. No country selected
   At {Confirm Creating Table} if no country is selected by the user,
   a. The system informs the user that no country is selected.
   b. The flow of events is resumed at {Enter Term}.
3. No data available
   At {Confirm Creating Table} if no valid data is stored in any one of the attributes required,
   a. The system informs the user that the current data is unavailable.
   b. The flow of events is resumed at {Enter Term}.

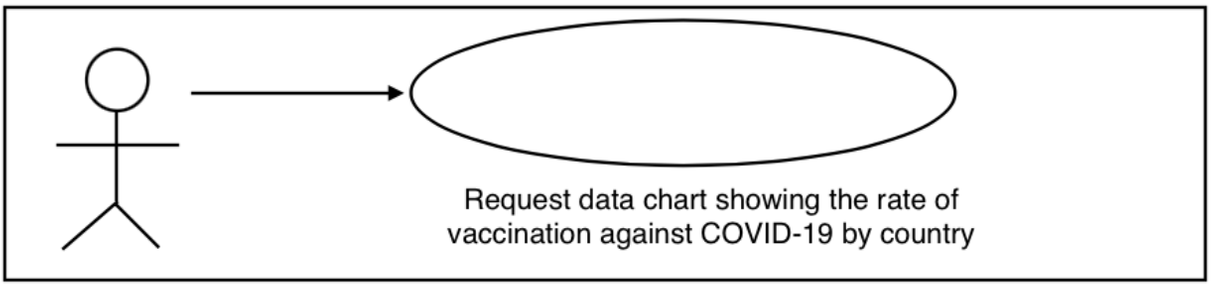
C2

Use Case: Generate data chart showing the rate of vaccination against COVID-19 by country

Brief Description:

This use case describes how a user generates a chart showing the rate of vaccination against COVID-19 by country

Use-case diagram:



Basic Flow:

1. The use case begins when the user chooses to generate Chart C.
2. The system displays the interface for entering required information for generating Chart C.

{Enter Term}

3. The user specifies the period of interest and countries of interest which would be shown onto the chart generated.

{Confirm Creating Chart}

4. The user confirms to generate Chart C.
5. The system retrieves data (“country”, “people_fully_vaccinated”, “population”, “date”) from the dataset.
6. The system calculates the rate of vaccination by dividing the “people_fully_vaccinated” by “population”.

{Display Chart}

7. The system generates and displays the chart.
8. The use case ends.

Alternative Flows:

1. Invalid Term
   At {Confirm Creating Chart} if the entered period of interest is invalid,
   a. The system informs the user that the entered period of interest is invalid.
   b. The flow of events is resumed at {Enter Term}.
2. No country selected
   At {Confirm Creating Chart} if no country is selected by the user,
   a. The system informs the user that no country is selected.
   b. The flow of events is resumed at {Enter Term}.
3. No data available
   At {Confirm Creating Table} if no valid data is stored in any one of the attributes required,
   a. The system informs the user that the current data is unavailable.
   b. The flow of events is resumed at {Enter Term}.