

Hiking Safety in Hong Kong

AIDM7360 **Dominos** Group Project Report

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Background & Issue

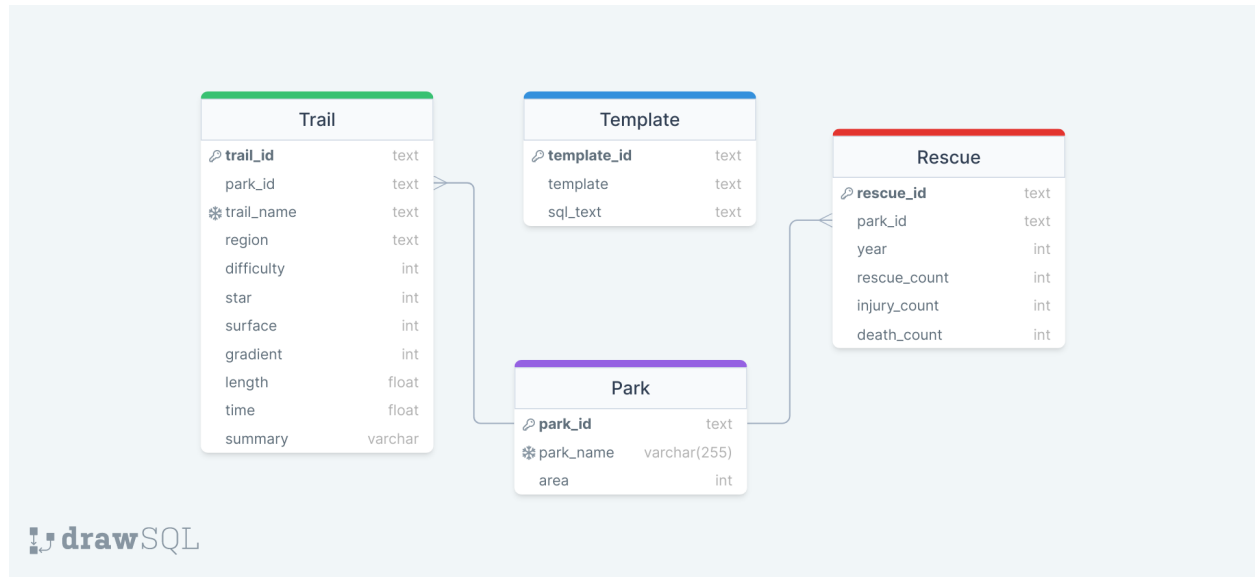
Hong Kong has a vivid hiking culture. From short nature trails to steep mountains, its Country Parks have something for everyone. However, in recent years, the number of fatal accidents and injuries related to hiking has risen, and the hiking season is starting again. Therefore, it is important to be aware of the potential hazards and take necessary precautions when planning a trip to country parks.

Methods

Generate an overview of hiking trails in Hong Kong, summarize key figures, and present statistics and analyses in relation to past accidents on hiking trails in country parks. Firstly, we design the database by identifying entities and attributes and creating appropriate tables. Next, we render the templates and reports as markdown to present the content in HTML and incorporate data visualization libraries to generate charts and graphs representing the statistics. Each template and chart can be reproducibly generated by querying the database with SQL and is scalable. And implement aggregate functions, subqueries and nested queries in SQL. Specifically, the template will automatically be queried for data and replace placeholders, and the populated template will be returned to the web page to display the results. Meanwhile, we implement user-friendly GUIs for data management, allowing for easy record insertion, querying, and deletion.

Database Schema

For our Automated Content Management System, we used trails, country parks, and 2020-2022 climbing rescue requests data as our dataset to provide the public with a general report on walking routes and potentially hazardous areas.



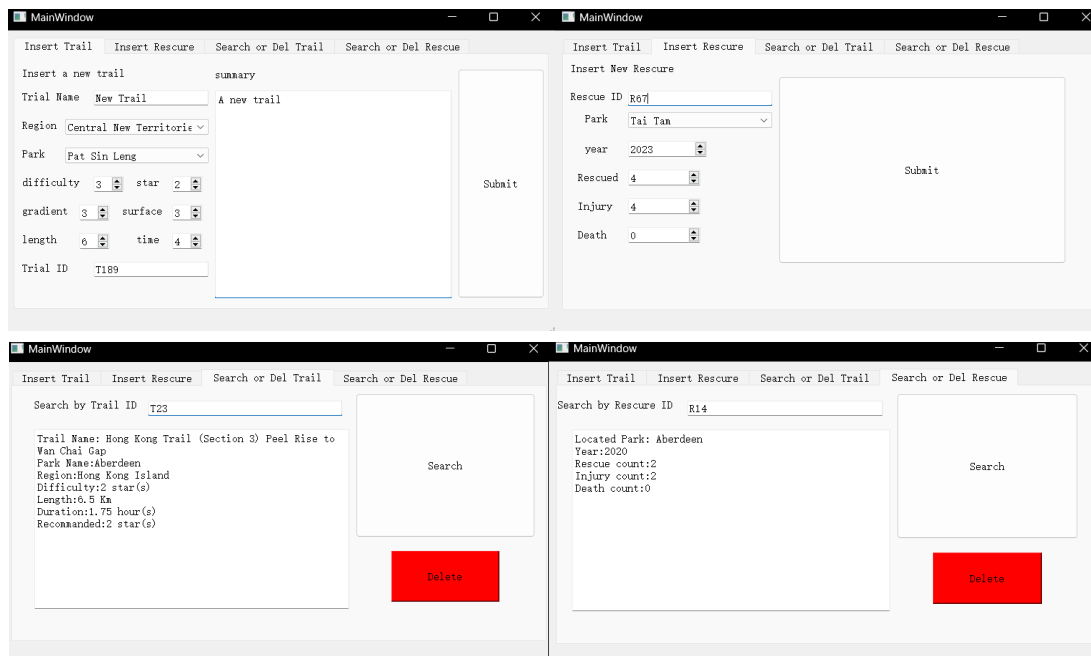
User Interface & GUI

User Interface Preview: Hiking Safety in Hong Kong

https://drive.google.com/file/d/1MpBp55WvfzwBAW8awXYLUix6i9aNm_YP/view?usp=sharing

Please check out the web preview of our project by the link. All templates have been populated with information into report form by querying, except for the first template, which can be freely queried via a drop-down list.

The following are GUI implementations for insertion, search and deletion.



Template

1. Discover Hiking Trails

Firstly, our templates will briefly introduce the facts of hiking trails in Hong Kong, such as the location, length, popular hiking trails and varied natural landscapes, and mention the different difficulty levels and durations of these hiking trails to emphasise the importance of understanding the characteristics of the trails in order to ensure a safe and enjoyable hiking experience.

2. Promoting Hiking Safety

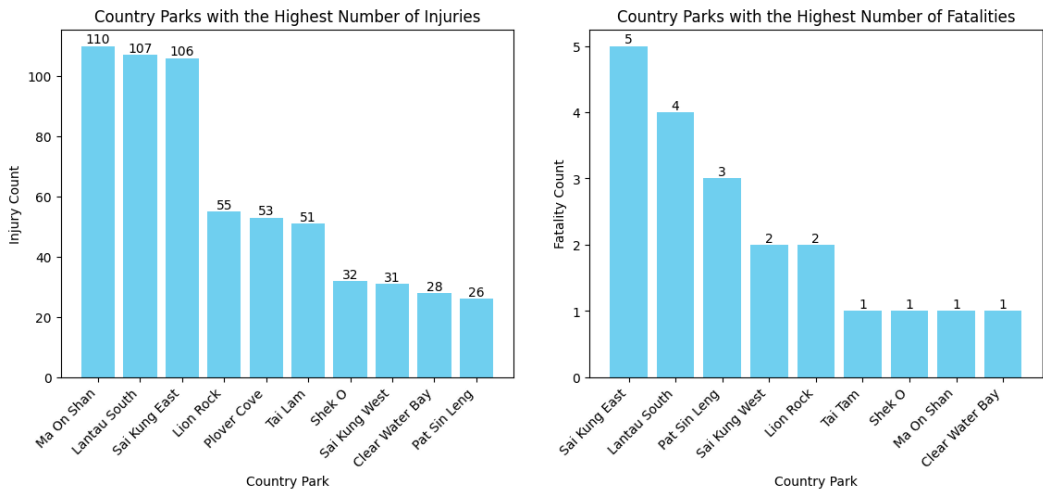
In Part 2, our templates outline the rescue accidents that have occurred in country park areas over the past three years. It also mentions the increase in the number of accidents and fatalities, which raises concerns about the safety of hikers. Finally, highlight any significant trends or patterns observed in the rescue incidents, such as specific areas with a higher occurrence of incidents.

Results and findings

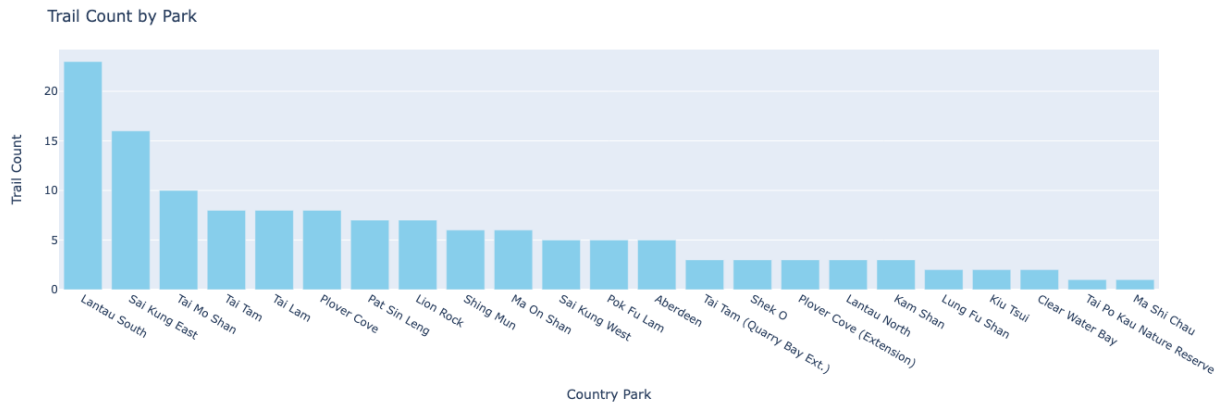
The number of incidents in three country parks, namely Ma On Shan, Sai Kung East and South Lantau, is obviously prominent and much higher than that in other country parks. In addition, Pat Sin Leng, Sai Kung West, Plover Cove, Tai Lam and Lion Rock country parks also have a high number of climbing rescue accidents, with the number of such accidents ranging from 50 to 100 in the past three years.

1. Accident Black Spot

Statistics show that **Ma On Shan Country Park** is the black spot of accidents, with the highest number of rescues and injuries among the country parks in Hong Kong. Among that, the 702-metre-high Ma On Shan is a dangerous peak in itself, with high-difficulty routes such as Hanging Hands Rock, and Tung Ma Tau in the vicinity, while the 602-metre-high Fei Ngo Shan is also within the area of the Ma On Shan Country Park. The area around the Suicide Cliff in the south of Fei Ngo Shan is a black spot where accidents often occur.



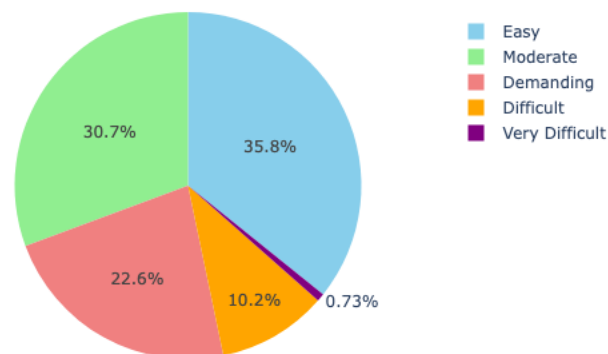
Lantau South Country Park also has a high number of accidents, with 196 rescue incidents in the past three years, ranking behind Ma On Shan and Sai Kung East, and the number of injuries and deaths in the park ranks second, with 107 injuries and 4 deaths. **Lantau South is the largest country park in Hong Kong**, including the two peaks of Fung Wong Shan and Tai Tung Shan. The **Sai Kung East** is the country park with the highest number of deaths, with a total of five people losing their lives on the mountain in the past three years.



2. Large Parks with Multiple Trails May Have More Accidents

Due to our limited dataset, we found this pattern. It is interesting to point out that we noticed that Lantau South and Sai Kung East are the two country parks with the most trails. From another angle, it means that because of the variety of trails, more people are going there for hiking, and the chance of accidents may also be higher.

Trail Difficulty Distribution



Over 1/3 of the trails in our dataset have an overall difficulty level above demanding. It is precisely because of the varying difficulty and length of trails in country parks that when choosing trails, hikers need to follow their abilities and not risk their lives for hiking.

Conclusion & Solution

In summary, the danger level of country parks is highly related to the difficulty and number of routes, and the number of hiking rescue cases in country parks has shown a significant upward trend, which undoubtedly increases the risk of travelling for hiking enthusiasts. Therefore, based on the above findings, to enhance hiking safety and awareness, we provide the following measures to be taken in three high-risk country parks in Ma On Shan, Sai Kung East and Lantau South.

The park management could set up more safety warning signs on difficult trails and dangerous areas, increase the frequency of patrols and improve safety and first aid measures;

The government should enhance hiking safety education, such as organising public education activities and seminars on hiking precautions and first aid measures to raise awareness and improve and optimise official applications & websites to update the latest information on country parks and trails timely.

However, these templates only provide information regarding the safety of the country parks based on our limited dataset, including the number of accidents, and casualties. It can be used to describe and compare the safety conditions of different parks, offering some insights. Since hiking safety is a complex issue influenced by various factors, these templates only provide an overview and general guidance, without covering all the details. For specific trail safety concerns, further research and analysis would be needed.

Project Link

<https://github.com/lviiholic/hiking>

README.md

Hiking Safety in HK

A group work project repository, maintained by Liao Liyi & Ni Yiming

Run server.py to start the flask web application. (open url: <http://127.0.0.1:5000>)

Run editor.py to start the GUI database editor.

Remarks:

- csv folder -> raw dataset csv file
- data folder -> hiking database
- static folder -> css & figure in html
- templates folder -> html template
- ui folder -> editor GUI
- buildDB.py -> create hiking database and tables, insert csv into tables
- grabbingTrail.ipynb -> a web crawler to get trail.csv data
- plotDataviz.ipynb -> create plots for data visualization
- templateHiking.py -> a function automatically identifies placeholders in templates for inserting query data
- text.md -> raw report content
- e2.py -> GUI file