# **How to create a Hotel Recommendation System using Sorting Algorithms?**

**Problem-based learning (PBL) for students of the Advanced Algorithms 1 course**

Une image contenant habits, homme, personne, chaussures

Description générée automatiquement

# **Background :**

The aim of travel recommendation systems is to suggest travel destinations of interest to Internet users, based on the opinions left by other users concerning the same trips, thus suggesting the best-rated destinations.

Une image contenant texte, capture d’écran, personne

Description générée automatiquement

Among the elements of travel recommendation, we find hotels. The system generates relevant hotel recommendations for travelers based on several criteria such as destination, budget, length of stay, activities on offer, quality of service, cleanliness and reviews left by other users.

Une image contenant texte, habits, affiche, dessin humoristique

Description générée automatiquement

# **Required work:**

You're a team of engineers and you want to create a recommendation application enabling users to discover the best hotels in the city.

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Description générée automatiquement

You will be guided by the following criteria:

|  |  |
| --- | --- |
| Reviews left by other travelers about the hotel. |  |
| The price of the hotel. |  |
| Hotel features, for example:  - Swimming pool  - Free parking  - Free High Speed Internet (WiFi)  - Fitness Centre with Gym / Workout Room  - Restaurant  - Breakfast available  - Meeting rooms  - Pets allowed  - Refrigerator in room  - Kitchenette....etc |  |

The application uses efficient sorting algorithms to rank hotels according to user preferences, and displays recommendations for each category.

Une image contenant Téléphone mobile, texte, Appareil de communications portable, gadget

Description générée automatiquement

The application also displays the execution time of each sorting algorithm, and indicates the best algorithm in terms of execution time.

Une image contenant habits, ordinateur portable, homme, personne

Description générée automatiquement

Une image contenant texte, capture d’écran, affichage, Police

Description générée automatiquement

# **Resources for dealing with the problem situation**

* Course 2 and TD 2 “Sorting algorithms: insertion sort, selection sort, bubble sort”
* The "Files" course (1st semester course: "Python")
* Optional : the "Tkinter graphical interfaces" course (1st semester course: "Python")
* The dataset :

<https://github.com/sachinnpraburaj/Intelligent-Travel-Recommendation-System/blob/master/tripadvisor_hotel_output/hotel_info_dedup.csv>

This dataset was used in a project that provides a Tailor-made travel itinerary for users using their travel details like destination, budget, start and end dates of travel and their preferences of attraction categories, hotel amenities and cuisine type.

Une image contenant texte, capture d’écran, reçu, Police

Description générée automatiquement

This dataset contains may information such as:

|  |  |
| --- | --- |
| Hotel identifier | **id** |
| Hotel name | **hotel\_name** |
| Hotel rating (vote) (average of ratings given by travelers who have visited this hotel)  This rating is between 0 and 5 | **hotel\_rating** |
| Hotel review (Excellent, very good, good, average, poor, terrible, bad) | **Hotel\_experience** |
| Hotel services (the list of services of this hotel, if the services have not been mentioned: the list is empty) :  - Swimming pool  - Free parking  - Free high-speed Internet (WiFi)  - Gym/training room  - Restaurant  - Breakfast available  - Conference rooms  - Pets allowed  - In-room refrigerator  - Kitchenette... | **amenities** |
| Hotel location (latitude and longitude) | **location** |
| Hotel rates | **price** |

* **Notes :**

- Replace the missing rating and hotel-experience values according to the following table:

|  |  |
| --- | --- |
| **Rating** | **Hotel\_experience** |
| 5 | Excellent |
| 4.5 | Excellent |
| 4 | Very good |
| 3.5 | Very good |
| 3 | Average |
| 2.5 | Average |
| 2 | Poor |
| 1.5 | Poor |
| 1 | Terrible |
| 0.5 | Terrible |
| 0 | Bad |

Pay attention to lower/upper case.

* If you can't find either the *rating* or the *hotel\_experience* on the same line, enter 0 for rating and Bad for *hotel\_experience*.
* If the price does not exist, replace it with the value 300.
* To calculate the execution time of each sorting algorithm, use the package time :

Une image contenant texte, capture d’écran, Police

Description générée automatiquement

* **Results to display :**

• Use different sorting algorithms to display N-TOP hotels:

- The hundred best hotels according to travelers' evaluation (rating).

- The hundred best hotels according to travelers' opinions (hotel\_experience).

- The hundred best hotels according to price (cheapest).

- The hundred best hotels that offer the greatest number of services (amenities).

• You can add other sorting criteria based on characteristics present in the dataset if you wish.

• View the execution time of each used sorting algorithm.

# **PBL Learning Objectives :**

•Understand and master sorting algorithms

• Test and compare sorting algorithms and be able to identify the fastest algorithm

• Distribute roles and tasks within the APP

• Comment on your code relevantly

• Summarize the group's work

• Use the Python language to manipulate text files

• Import, use and test a dataset from a CSV file