

Industry Project

Report

On

Travel Rate Scrapping

Developed By:-

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Guided By:-

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Mr. Pratik Patel

Submitted to
Department of Computer Science &
Engineering Institute of Computer
Technology



Ganpat
University

॥ विद्यया समाजोत्कर्षः ॥

Institute of
Computer
Technology



Year: 2022

CERTIFICATE

This is to certify that the **Industry Project** work entitled “**Travel Rate Scraping**” by Hem Kamli (20162101005) of Ganpat University, towards the fulfilment of requirements of the degree of Bachelor of Technology – Computer Science and Engineering, carried out in the CSE(CBA) Department at OneClick IT Consultancy Pvt. Ltd. The results/findings contained in this Project have not been submitted in part or full to any other University / Institute for award of any other Degree/Diploma.

Name & Signature of Internal Guide

Name & Signature of Head

Place: ICT - GUNI

Date:

ACKNOWLEDGEMENT

An Industry Internship project is a golden opportunity for learning and self-development. I consider myself very lucky and honored to have so many wonderful people lead me through in completion of this project. First and foremost, I would like to thank Dr. Rohit Patel, Principal, ICT, and Prof. Dharmesh Darji, Head, ICT who gave us an opportunity to undertake this project. My grateful thanks to Prof. Neha Rajput & Mr. Pratik Patel (Internal & External Guides) for their guidance in project work Travel Rate Scraping, who despite being extraordinarily busy with academics, took time out to hear, guide, and keep us on the correct path. We do not know where would have been without his/her help. The CSE department monitored our progress and arranged all facilities to make life easier. We choose this moment to acknowledge their contribution gratefully.

Hem Kamli (20162101005)



Date: April 29th, 2024

WHOSOEVER IT MAY CONCERN

This is to certify that **Mr. Hem Kamli** is completing his training on the **NodeJS** framework.

He is working on a project on the NodeJS framework named **Travel Rate Scrapping**, under the guidance of Pratik Patel.

We appreciate his efforts and hard work during the internship program.

We wish him all the best in his future endeavors.

We are confident that the skills and experience gained during the internship will be valuable to his career.

Regards,

Devshree Waghodkar

Senior HR Specialist - Human Resources

One Click IT Solutions

ABSTRACT

The travel rate scraping project proposes an automated system to streamline flight data collection from various B2B and B2C websites into a centralized database. It aims to offer users comprehensive flight information, including the cheapest fares and all available options for specific routes, accessible through an intuitive dashboard. Future work includes expanding data sources, integrating advanced data analysis techniques, and incorporating user preferences for personalized recommendations. Real-time updates and mobile application development are suggested to enhance accessibility, while partnerships with travel agencies and airlines can improve service quality and access to exclusive deals. User feedback mechanisms will drive iterative improvements, ensuring the system remains responsive to evolving user needs and industry trends. Through these enhancements, the system can evolve into a robust platform, providing travelers with efficient and informed flight booking solutions.

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CHAPTER: 1 INTRODUCTION

INTRODUCTION

The flight data scraping project introduces an innovative solution for efficiently gathering flight information from various online platforms, both business-to-business (B2B) and business-to-consumer (B2C). The goal is to centralize this data into a single database, providing users with a comprehensive view of available flights, including pricing details and route options. The project's primary objective is to simplify the process of finding the best flight deals by presenting all relevant information in an easy-to-use dashboard. By automating data collection and aggregation, users can quickly compare fares and make informed decisions.

Future developments for the project include expanding the sources of data to ensure coverage of a wider range of airlines and travel agencies. Additionally, plans involve incorporating advanced data analysis techniques to offer users personalized recommendations based on their preferences and travel history. To enhance accessibility, the project proposes the development of a mobile application provides real-time updates and allows users to access flight information on the go. Furthermore, partnerships with travel agencies and airlines are envisaged to improve service quality and provide users with access to exclusive deals and promotions.

Continuous feedback mechanisms will be implemented to gather user input and refine the system based on evolving needs and industry trends. This iterative approach ensures that the system remains responsive and adaptable to changing requirements.

Overall, the project aims to evolve into a robust platform that offers travelers efficient and informed solutions for booking flights. By leveraging technology and user feedback, the system will continue to enhance the travel booking experience, making it easier and more convenient for users to find the best flight options available.

CHAPTER: 2 OBJECTIVE

OBJECTIVE

Primary Objective

The primary objective of this project is to develop a travel rate scraping system that collects flight data from diverse sources and stores it in a database.

Specifically, the objectives include:

- Implementing web scraping algorithms to extract flight information from B2B and B2C websites.
- Designing a database schema to efficiently store and manage the scraped data.
- Developing a user-friendly dashboard interface to display the cheapest flights and all available options for a given route.
- Implementing algorithms to analyze and compare flight prices, enabling users to make informed decisions.
- Ensuring the scalability and reliability of the system to accommodate future expansions and updates.

Literature Review

Previous research in the field of travel technology has explored various approaches to automate the process of collecting and analyzing flight data. Web scraping techniques have been widely adopted to extract information from websites efficiently. Additionally, database management systems have been utilized to store and organize large volumes of data collected from disparate sources. Several studies have also focused on developing user interfaces that provide intuitive ways for travelers to search and compare flight options. By building upon existing methodologies and technologies, this project aims to contribute to the advancement of travel technology by providing a comprehensive and user-centric solution for accessing flight information.

CHAPTER: 3 METHODOLOGY

METHODOLOGY

Website Selection

Flight data will be scraped from a diverse selection of B2B and B2C travel websites, considering factors like popularity, reliability, and relevance to users. Websites with large user bases, trusted data accuracy, and catering to various traveler preferences will be prioritized for data extraction.

Technology Selection

- Choose appropriate technologies for web scraping, database management, and front-end development.
- Node.js with Crawlee (Playwright) is selected for web scraping due to its robustness and flexibility.
- MySQL is chosen for database management due to its reliability and scalability.
- Next.js is selected for building the front-end dashboard due to its efficiency in creating interactive and responsive web applications.

Web Scraping

Utilizing Crawlee (Playwright), a Node.js library, for web scraping offers several advantages. Playwright's comprehensive API allows for seamless automation of web interactions, enabling the scraping of flight information such as prices, departure times, airlines, and available routes from selected websites.

Developing scraping scripts with error-handling mechanisms is essential to ensure the reliability and robustness of the scraping process. Error handling mechanisms should address potential issues such as website changes, page loading errors, and data inconsistencies to ensure smooth operation and accurate data extraction.

By implementing these strategies, the project can effectively scrape flight data from a variety of B2B and B2C travel websites, providing users with accurate and up-to-date information to facilitate informed decision-making.

Database Management

Creating a MySQL database schema to store scraped flight data involves designing tables to organize and manage the information effectively. Key tables may include those for flights, airlines, routes, and additional relevant data.

For the flight table, attributes such as flight number, departure and arrival airports, departure and arrival times, and ticket prices can be included. Additionally, the airline table can store information about different airlines, such as their names and contact details.

Routes can be stored in a separate table, containing details about specific flight paths, including departure and arrival airports and distances. Other relevant information, such as aircraft types or departure terminals, can be stored in additional tables as needed.

Utilizing the Node.js MySQL library, a connection with the database can be established to execute SQL queries for tasks such as data insertion, retrieval, and management. This allows for seamless integration between the backend and the database, enabling efficient handling of scraped flight data.

Implementing data validation and normalization techniques is crucial to maintain data integrity and consistency within the database. This involves validating incoming data to ensure it meets predefined criteria and normalizing the data structure to eliminate redundancy and improve efficiency.

Frontend Development

Develop the frontend dashboard using Next.js, a React framework for server-side rendering and client-side routing.

Design intuitive user interfaces with responsive layouts and interactive components for displaying flight information.

Implement features such as search functionality, sorting options, and filters to facilitate user navigation and exploration of flight data.

CHAPTER: 4 IMPLEMENTATION DETAILS

IMPLEMENTATION DETAILS

Web Scraping

Node.js with Crawler (Playwright): Utilized Node.js with Crawler, a web scraping library built on top of Playwright, to automate the extraction of flight data from various B2B and B2C travel websites.

Playwright Crawler: Developed custom crawlers using Playwright to navigate through web pages, interact with elements, and extract flight information such as airline names, flight numbers, prices, and source-destination pairs.

Scraping Multiple Websites: Implemented scraping scripts for multiple websites to collect comprehensive flight data. Each script was tailored to the structure and layout of the respective website, ensuring accurate extraction of relevant information.

Integration of Playwright and Crawler: Leveraged Playwright's browser automation capabilities within Crawler's framework to orchestrate scraping tasks efficiently. Crawler abstracted away the complexities of Playwright, providing a higher-level interface for defining scraping logic and managing concurrency.

How Playwright and Crawler Work Together: Integrated Playwright's browser automation capabilities within Crawler's framework to automate browser interactions, navigation, and data extraction efficiently. Crawler abstracted away the complexities of Playwright, providing a higher-level interface for defining scraping tasks and managing concurrency.

Database Management

MySQL for Data Storage: Employed MySQL as the relational database management system (RDBMS) for storing the scraped flight data. Designed a database schema comprising tables for flights, airlines, routes, and pricing information to organize the data efficiently.

Express App for API Endpoint: Implemented an Express.js application to serve as an API endpoint for interacting with the MySQL database. Defined RESTful routes and endpoints to handle CRUD operations for retrieving, updating, and deleting flight data.

Comparison of Prices: Developed algorithms to compare prices obtained from different airlines across various websites. Utilized unique airline numbers as identifiers to match and compare prices with corresponding entries in the database tables.

JSON Data Handling

Storage in JSON Files: Stored JSON data representing request bodies in files within the project directory. These JSON files contained structured data representing the parameters required for initiating scraping tasks.

Utilization in Crawllee: Loaded the JSON data from files and passed them as input parameters to Crawllee's scraping tasks. This facilitated the customization and configuration of scraping tasks based on specific requirements and user preferences.

Error Handling and Scalability

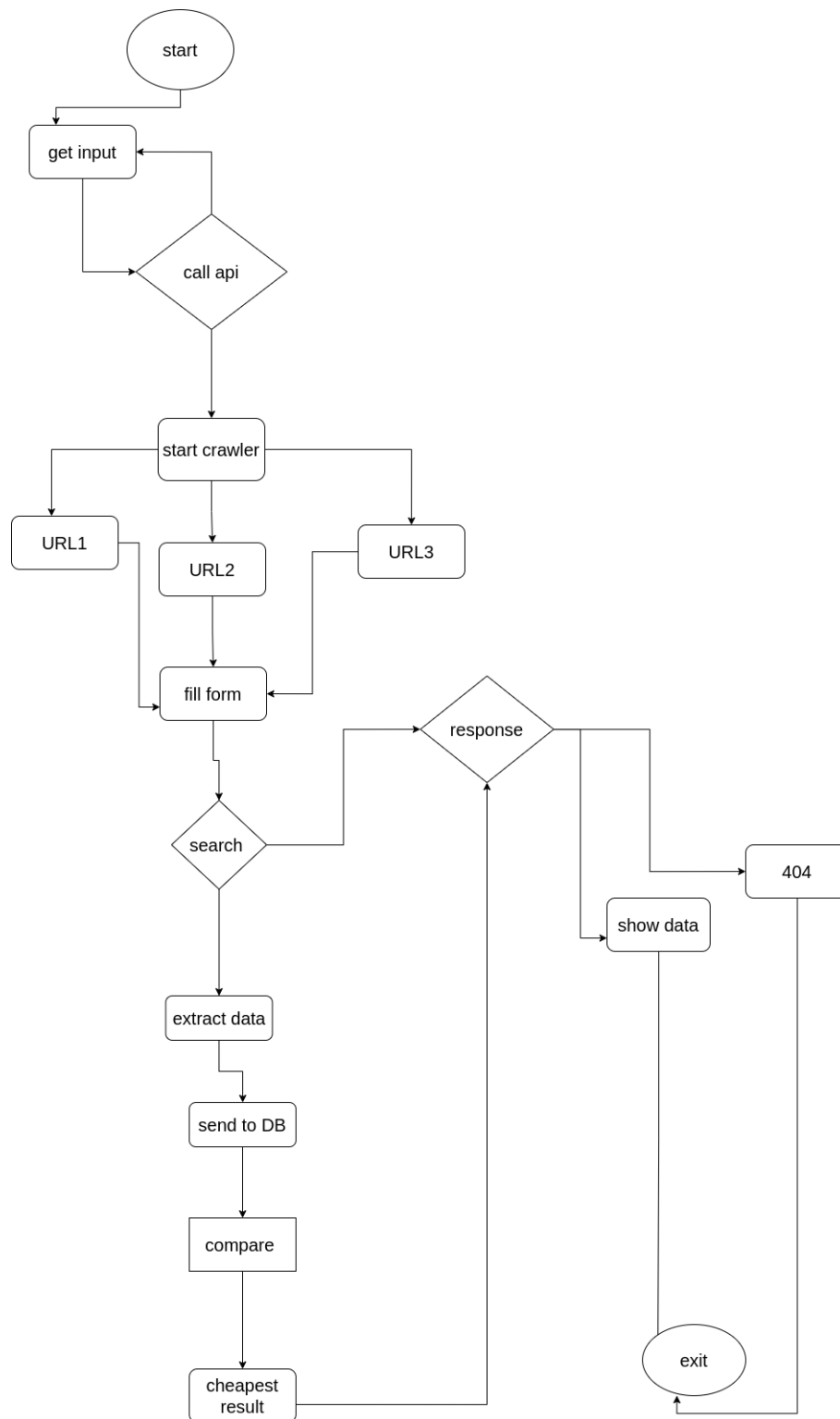
Error Handling: Implemented robust error handling mechanisms within the web scraping scripts to gracefully handle exceptions, such as network errors, page timeouts, and unexpected changes in website structure. Employed retry strategies and logging functionalities to capture and manage errors effectively, ensuring the reliability and resilience of the scraping process.

Scalability: Designed the architecture of the web scraping system to be scalable, and capable of handling large volumes of data and concurrent scraping tasks. Utilized asynchronous programming techniques in Node.js to optimize performance and resource utilization, enabling the system to scale horizontally by adding more scraping instances or vertically by leveraging powerful hardware resources. Employed load balancing and distributed processing strategies to distribute scraping tasks across multiple servers or cloud instances, further enhancing the system's scalability and responsiveness to varying workloads.

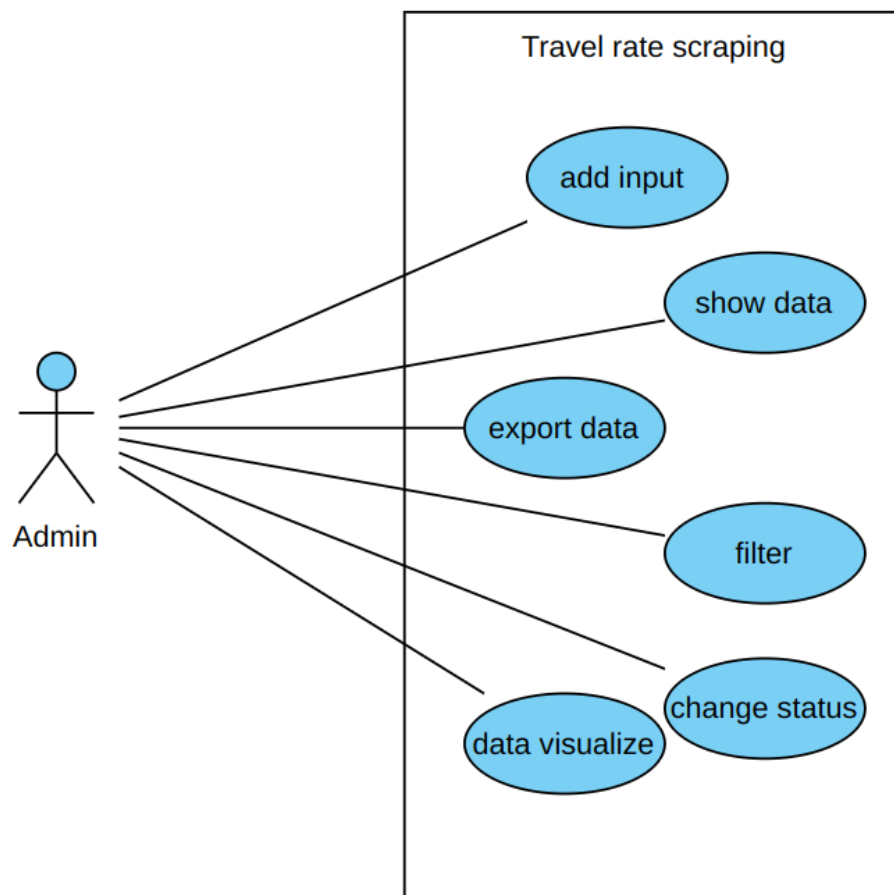
CHAPTER: 5 SYSTEM DESIGN

SYSTEM DESIGN

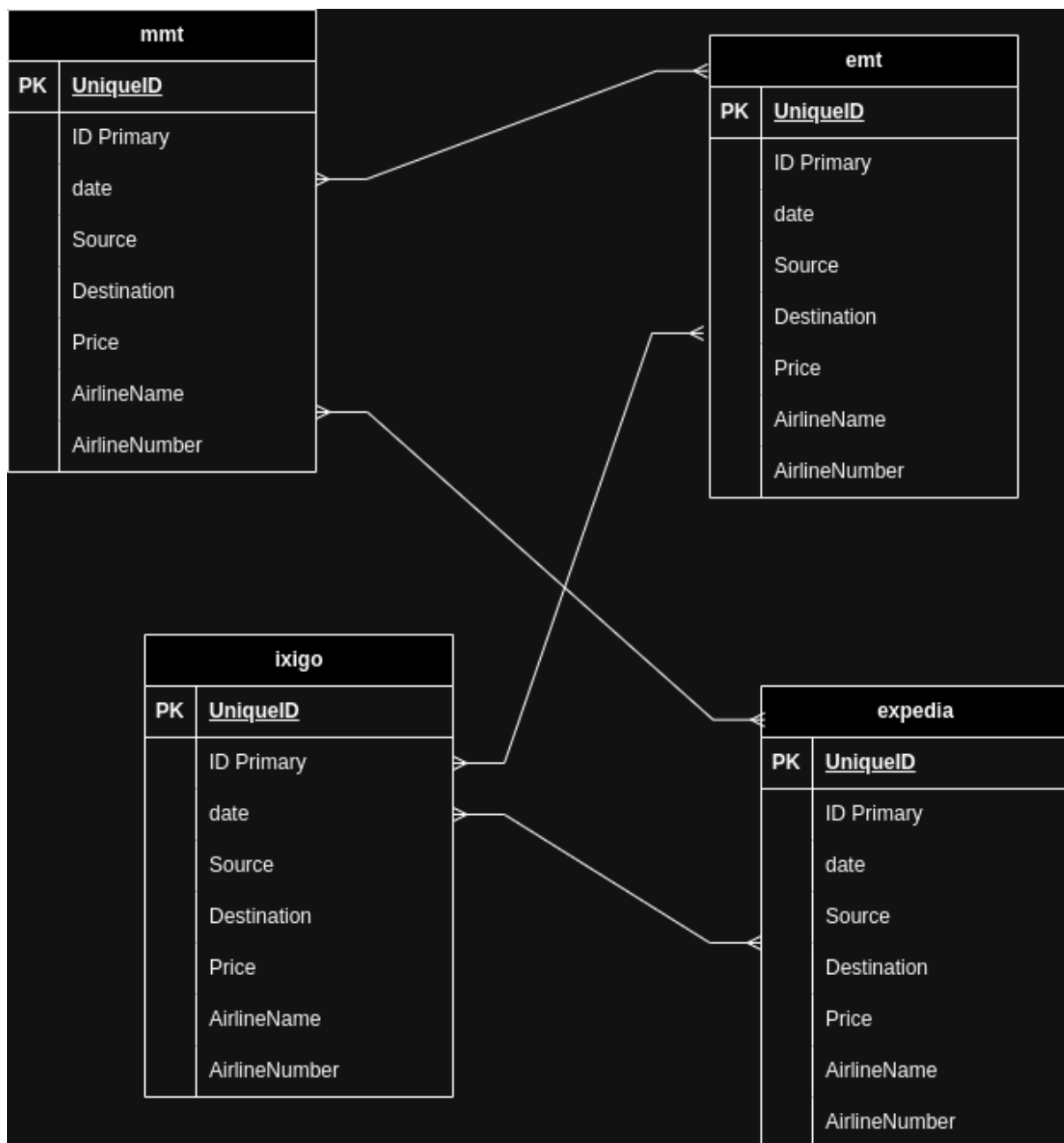
Data Flow Diagram



Use Case Diagram



ER Diagram



CHAPTER: 6 REQUIREMENTS

HARDWARE AND SOFTWARE REQUIREMENTS

Hardware Requirements:

- Processor: Intel Core i5 or equivalent processor (or higher) for optimal performance.
- RAM: Minimum 8GB RAM for smooth operation of development tools and database management.
- Storage: At least 256GB SSD for storing project files, databases, and related data.
- Network: Stable internet connection for web scraping tasks and accessing online resources.

Software Requirements:

- Operating System: Any modern operating system supported by Node.js, such as Windows, macOS, or Linux.
- Development Environment:
 - Node.js: Latest stable version of Node.js installed for running JavaScript-based applications.
 - Visual Studio Code or any preferred code editor for writing and editing project code.
- Web Scraping Tools:
 - Crawlee with Playwright: Install Crawlee library along with Playwright for web scraping tasks.
- Database Management System:
 - MySQL: Latest version of MySQL Community Server for storing and managing scraped flight data.
- Frontend Development Framework:
 - Next.js: Install Next.js framework for building the frontend dashboard interface.
 - React.js: Next.js is built on top of React.js, so ensure React.js is also installed.
- Backend Framework:
 - Express.js: Install Express.js for creating API endpoints to interact with the MySQL database.
- Dependency Management:

- npm (Node Package Manager): Used for installing and managing project dependencies.
- Version Control:
 - Git: Version control system for tracking changes to project code and collaborating with team members.
 - GitHub or GitLab: Online platforms for hosting project repositories and facilitating collaborative development.

Additional Tools and Libraries:

- Postman: Useful for testing API endpoints and making HTTP requests during development.
- MySQL Workbench: GUI tool for managing MySQL databases and executing SQL queries.
- Browser Developer Tools: Chrome DevTools or similar tools for inspecting web pages and debugging web scraping scripts.
- Data Visualization Libraries: Optional libraries such as D3.js or Chart.js for visualizing scraped flight data in the frontend dashboard.

CHAPTER: 7 DEVELOPMENT SCREENSHOTS

- Entering Departure Location using crawlee automation / playwright crawler.

Flights Hotels Trains Buses Book Flights, Trains, Buses & Hotels

One Way Round Trip Hassle-Free Bookings

From To Departure Fri, 29 Mar Return Travellers & Class 1 Traveller, Economy Search

Popular Airports

- DEL New Delhi, Delhi, India
Indira Gandhi Intl Airport
- BOM Mumbai, Maharashtra, India
Chhatrapati Shivaji International Airport
- HYD Hyderabad, Telangana, India
Rajiv Gandhi International Airport
- BLR Bengaluru, Karnataka, India
Kempegowda International Airport
- MAA Chennai, Tamil Nadu, India
Chennai International Airport

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Get Flat 10% Off on Flights via One Card Code: IXIONE

Get Flat 10% Off on Hotels via ixigo AU Credit Card Code: IXIGOCSTAY

New Domestic Flight Routes

Get upto 25% off on Flights. Also enjoy Free Cancellation with Assured Flex Code: INSTANT

- Entering Arrival Location using playwright.

Flights Hotels Trains Buses Book Flights, Trains, Buses & Hotels

One Way Round Trip 24x7 Customer Support

From AMD - Ahmedabad To Dubai Departure Fri, 29 Mar Return Travellers & Class 1 Traveller, Economy Search

Special Fares (Optional): Student DXB Dubai, Dubai, United Arab Emirates
Dubai International Airport

Do More With ixigo

Flight Status Credit Card Book Visa Plan Car Rentals Group Booking Airport Cabs Fare Alerts

Offers For You

oneCard Get Flat 10% Off on Flights via One Card Code: IXIONE

Get Flat 10% Off on Hotels via ixigo AU Credit Card Code: IXIGOCSTAY

New Domestic Flight Routes

Get upto 25% off on Flights. Also enjoy Free Cancellation with Assured Flex Code: INSTANT

- Selecting departure Date on ixigo.

Flights Hotels Trains Buses Book Flights, Trains, Buses & Hotels

One Way Round Trip Hassle-Free Bookings

From AMD - Ahmedabad To DXB - Dubai Departure Fri, 29 Mar Return Travellers & Class 1 Traveller, Economy Search

Special Fares (Optional): Student Senior Citizen Armed

Do More With ixigo

Flight Status Credit Card Book Visa

Offers For You

onecard Get Flat 10% Off on Hotels via ixigo AU Credit Card Code: IXIONE

Get Flat 10% Off on Hotels via ixigo AU Credit Card Code: IXIGOCSTAY

May Day 01 May - 1 Day Rabindranath Tagore Jayanti Long Weekend 04 May - 07 May - 4 Days Holiday List

- Extracting flight details from the searched flight results.

ixigo Flights Hotels Trains Buses More Offers Customer Service Log in/Sign up

From AMD - Ahmedabad To DXB - Dubai Departure Sun, 22 Dec Return Travellers & Class 1 Traveller, Economy Search

Special Fares (Optional): Student Senior Citizen Armed Forces

Filters

Stops

Non-Stop ☐

1 Stop ☐

2+ Stops ☐

Exclude Non-Refundable ☐

Flight Price

21308 457626

Departure from Ahmedabad

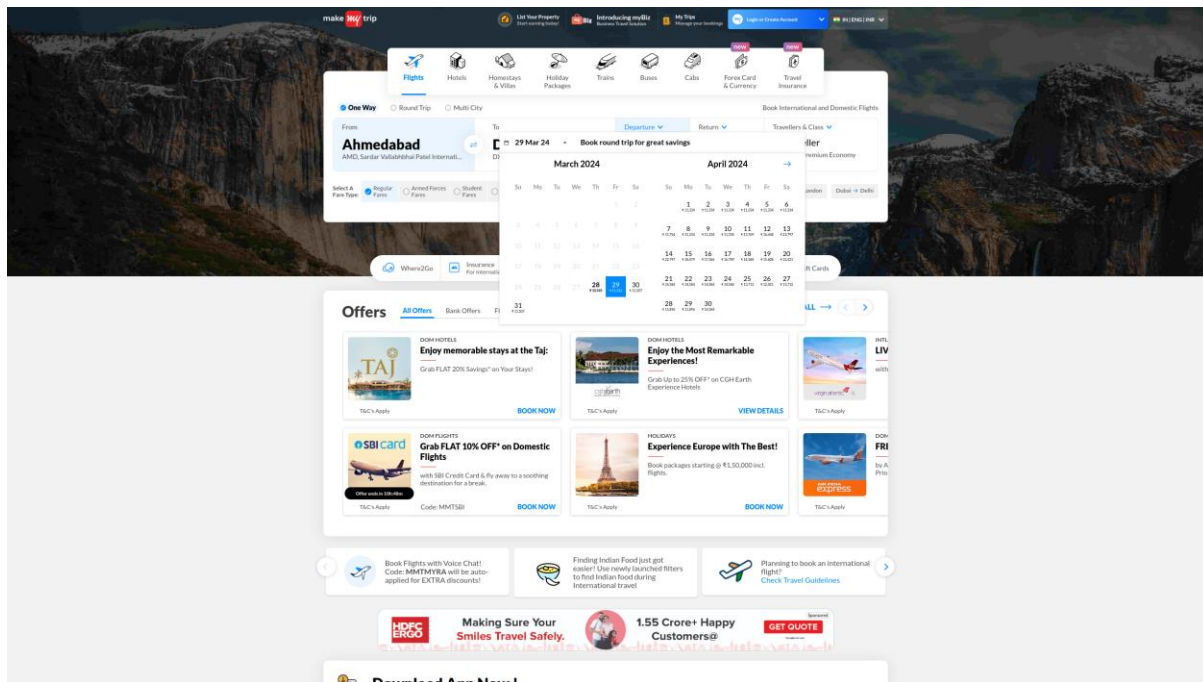
Sort by Price (Low to High) Fastest (Shortest First) Departure (Earliest First) Smart (Recommended)

Cheapest

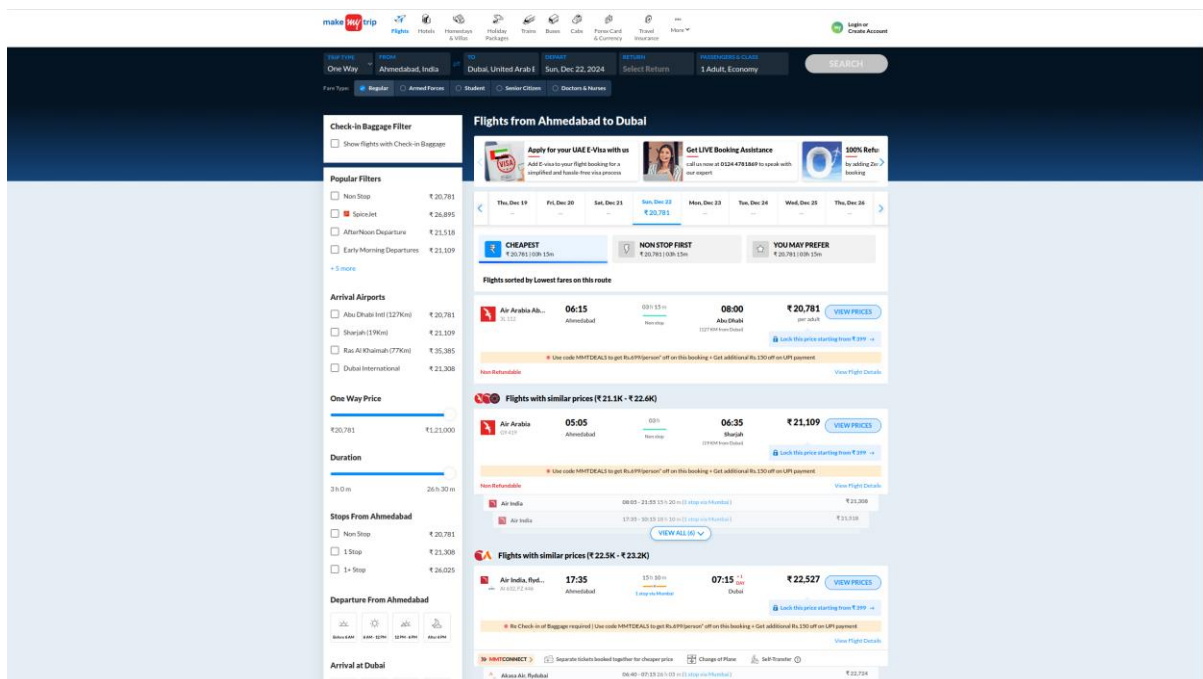
144 Flights Available

Flight	Departure	Arrival	Price	Book
Air India AI614, AI983	08:05 AMD	21:55 DXB	₹21,308 ₹20,053	Book
Air India AI638, AI983	20:30 AMD	21:55 ⁺ DXB	₹21,308 ₹20,053	Book
Air India AI638, AI909	20:30 AMD	10:15 ⁺ DXB	₹21,518 ₹20,258	Book

- Picking Date on mmt using playwrite's page.click()



- Extracting searched flight details from MakeMyTrip.



- Qunar data scrap flight details.

Qunar B2B Distribution Portal romitarara@itoneclick.com source DEL OneClick-USD Qunar B2B Distribution Portal User Manual.docx Logout

Flight Search

MMB

User Manager

Depart City: AMD, Arrive City: DEL, Cabin Level: AS, Adult Number: 1, Child Number: 0, One-Way, Departure Date: 2024-05-29, Search

AMD - DEL, 2024-05-29, results20

lowest price, earliest departure time, earliest arrival time, Shortest travel time

Stops

0
1
2+
all

Airlines

QQP
Q6E
QUK
QSG
QAI
QHI
all

Go Trip

Depart Airport	Arrive Airport	Flight Number	Cabin Level	Cabin Code	Depart Time	Arrive Time	Stops	Transit	Price
AMD(T1)	DEL(T2)	QP1145	economy	K	2024-05-29 06:20	2024-05-29 07:55			From USD 56.63 Select
AMD(T1)	DEL(T2)	6E2385	economy	V	2024-05-29 23:20	2024-05-30 01:00			From USD 58.97 Select
AMD(T1)	DEL(T2)	QP1342	economy	K	2024-05-29 09:15	2024-05-29 10:55			From USD 62.15 Select
AMD(T1)	DEL(T3)	UK946	economy	V	2024-05-29 08:40	2024-05-29 10:25			From USD 63.95 Select
AMD(T1)	DEL(T2)	6E2736	economy	Q	2024-05-29 07:05	2024-05-29 08:40			From USD 63.53 Select
AMD(T1)	DEL(T3)	6E5079	economy	Q	2024-05-29 09:45	2024-05-29 11:15			From USD 67.26 Select
AMD(T1)	DEL(T2)	6E2032	economy	V	2024-05-29 18:55	2024-05-29 20:35			From USD 65.47 Select
AMD(T2)	DEL(T3)	SG6194	economy	U	2024-05-29 06:10	2024-05-29 07:50			From USD 55.52 Select

- TBO flight data stored in DB

Local instance MySQL83 - W...

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

skila

scrap

Tables

airlineata

expedia

gflights

argo

mmt

qunar

tbo

tboprice

Views

Stored Procedures

Functions

sql

Tables

Views

Stored Procedures

Functions

sys

test

testdb

Administration

Schemas

Information

Table: expedia

Columns:

id int AI 1

searchedAt timestamp

departureLocation varchar

arrivalLocation varchar

departureDate date

arrivalDate date

flightNo json

airline json

price json

direct

SQL File 3'

airlineata mmt airlineata tboprice tbo

1 • SELECT * FROM scrap.tbo;

Limit to 1000 rows

Result Grid

id	searchedAt	departureLocation	arrivalLocation	departureDate	arrivalDate	flightNo	airline	price	direct
1	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[2263]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 4720, "pub... 1	
2	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[8194]	[SpiceJet]	[[{"id": 1, "type": "Coupon", "offPrice": 5118, "pub... 1	
3	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[2047]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 5252, "pub... 1	
4	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[1145]	[Akasa Air]	[[{"id": 1, "type": "Saver", "offPrice": 5401, "pub... 1	
5	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[978]	[Vistara]	[[{"id": 1, "type": "Cluster/IBF", "offPrice": 5417... 1	
6	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[2032]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 5530, "pub... 1	
7	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[6042]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 5533, "pub... 1	
8	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[482]	[Air India]	[[{"id": 1, "type": "Publish", "offPrice": 5554, "pub... 1	
9	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[1342]	[Akasa Air]	[[{"id": 1, "type": "Saver", "offPrice": 5590, "pub... 1	
10	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[7568, 2029]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 5782, "pub... 0	
11	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[5079]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 5826, "pub... 0	
12	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[2736]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 5892, "pub... 0	
13	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[906]	[Vistara]	[[{"id": 1, "type": "Cluster/IBF", "offPrice": 5935... 0	
14	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[7261, 6262]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 6146, "pub... 0	
15	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[7145, 2176]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 6146, "pub... 0	
16	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[2794]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 6205, "pub... 0	
17	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[946]	[Vistara]	[[{"id": 1, "type": "Cluster/IBF", "offPrice": 6252... 0	
18	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[836]	[Air India]	[[{"id": 1, "type": "Publish", "offPrice": 6351, "pub... 0	
19	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[6244, 6008]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 6661, "pub... 0	
20	2024-04-23 21:14:26	AMD	DEL	2024-05-24	2024-05-24	[277, 546]	[Indigo]	[[{"id": 1, "type": "Saver", "offPrice": 6864, "pub... 0	

tbo 1 x

Action Output

#	Time	Action	Message	Duration / Fetch
2	14:03:25	use scrap	0 row(s) affected	0.000 sec
3	14:03:25	SELECT tbo.departureLocation, tbo.departureDate, tbo.arrivalLocation, tbo.arrivalDate, tbo... 1000 row(s) returned		0.000 sec / 0.015 sec
4	14:29:16	SELECT * FROM scrap.tbo LIMIT 0, 1000	285 row(s) returned	0.000 sec / 0.000 sec

- IXIGO flight scraped data in MySQL

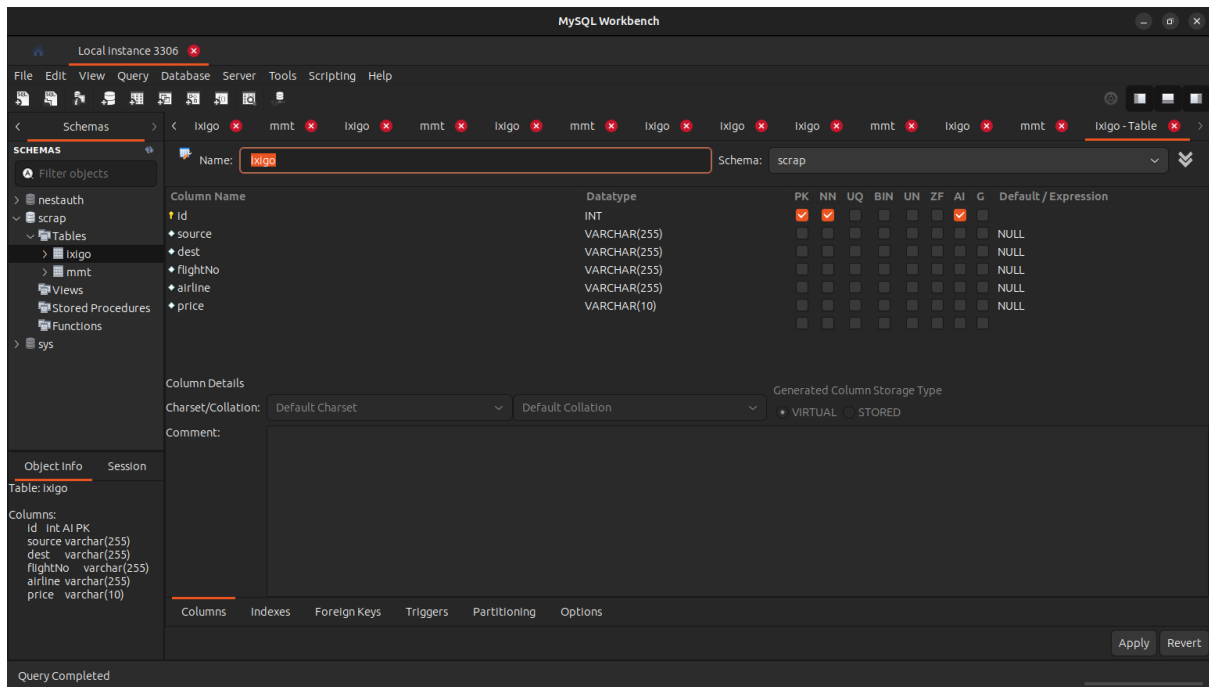
The screenshot shows the MySQL Workbench interface with a query executed: `SELECT * FROM scrap.ixigo;`. The result set displays 15 rows of flight data. The left sidebar shows the database schema with the 'scrap' database selected, and the 'ixigo' table highlighted. The 'Object Info' pane shows the table's columns and their data types.

#	id	source	dest	flightNo	airline	price
1	1	AMD	DXB	AI638, AI983	Air India	₹20,053
2	2	AMD	DXB	AI638, AI909	Air India	₹20,258
3	3	AMD	DXB	AI632, AI909	Air India	₹20,258
4	4	AMD	DXB	AI614, AI909	Air India	₹20,258
5	5	AMD	DXB	EK541	Emirates	₹21,703
6	6	AMD	DXB	EK539	Emirates	₹21,703
7	7	AMD	DXB	UK918, AI983	Vistara, Air India	₹21,744
8	8	AMD	DXB	AI482, AI947	Air India	₹21,858
9	9	AMD	DXB	AI532, AI929	Air India	₹21,858
10	10	AMD	DXB	AI836, AI929	Air India	₹21,858
11	11	AMD	DXB	AI482, AI929	Air India	₹21,858
12	12	AMD	DXB	UK918, AI909	Vistara, Air India	₹21,949
13	13	AMD	DXB	AI482, AI995	Air India	₹21,958
14	14	AMD	DXB	AI532, AI995	Air India	₹21,958
15	15	AMD	DXB	AI632, AI995	Air India	₹21,958

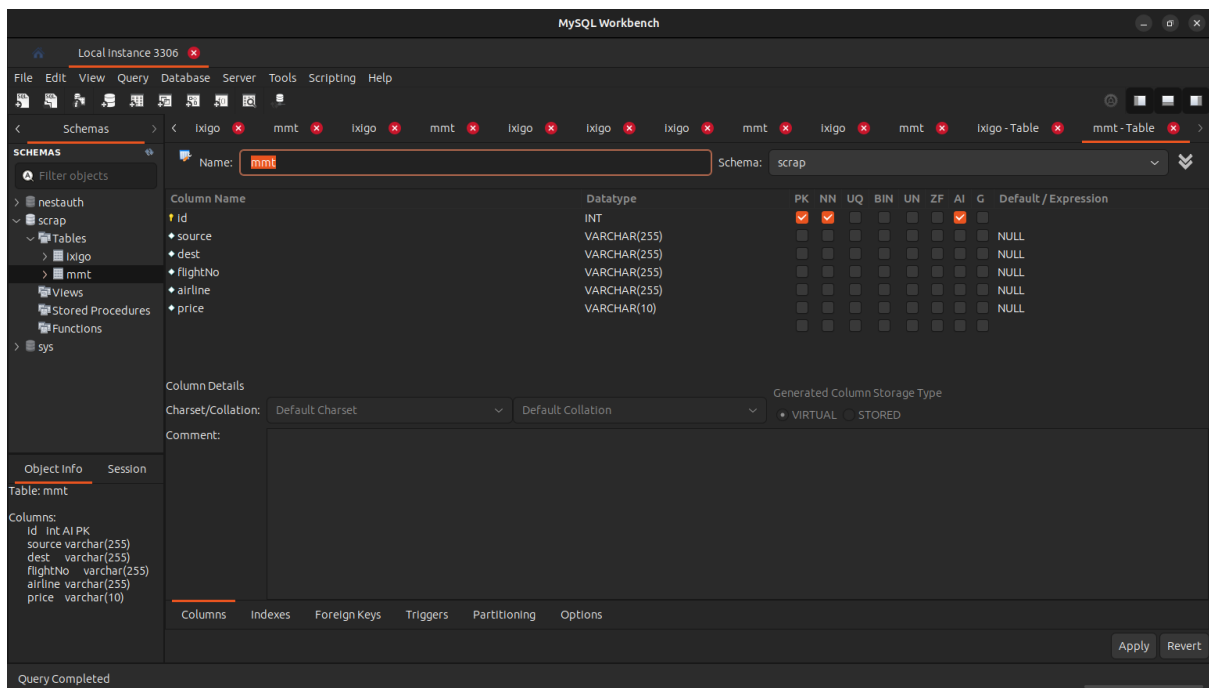
- Storing MMT scraped data in MySQL.

The screenshot shows the MySQL Workbench interface with a query executed: `SELECT * FROM scrap.mmt;`. The result set displays 7 rows of flight data. The left sidebar shows the database schema with the 'scrap' database selected, and the 'mmt' table highlighted. The 'Object Info' pane shows the table's columns and their data types.

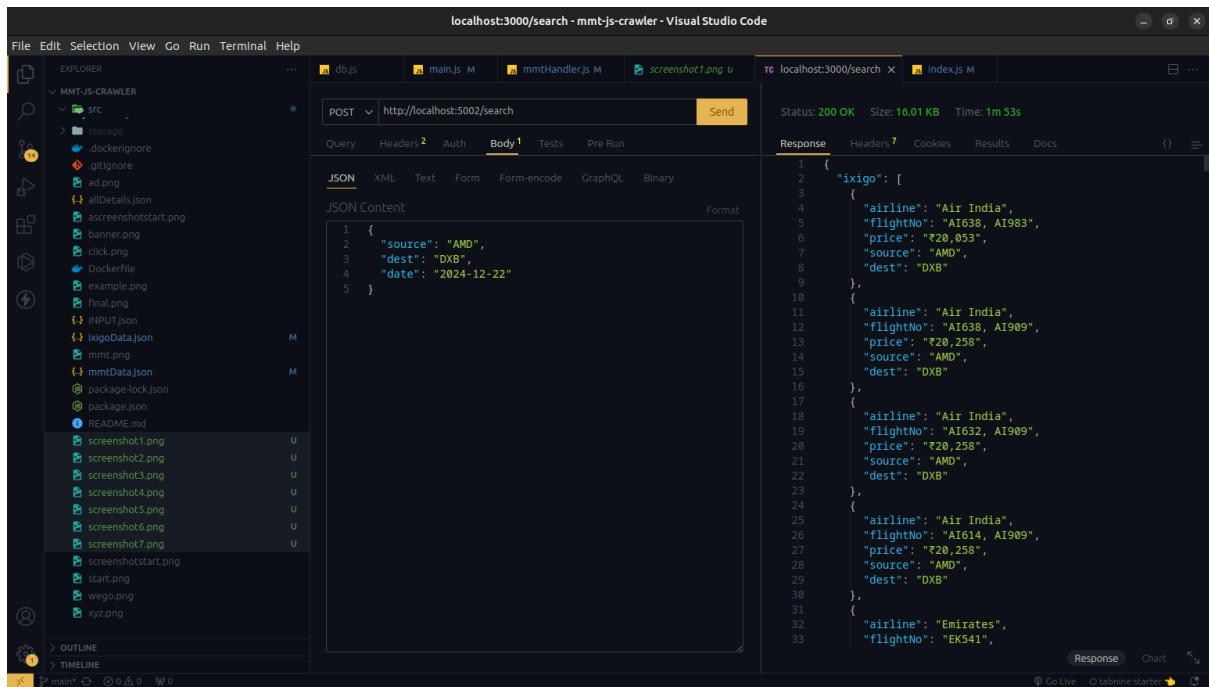
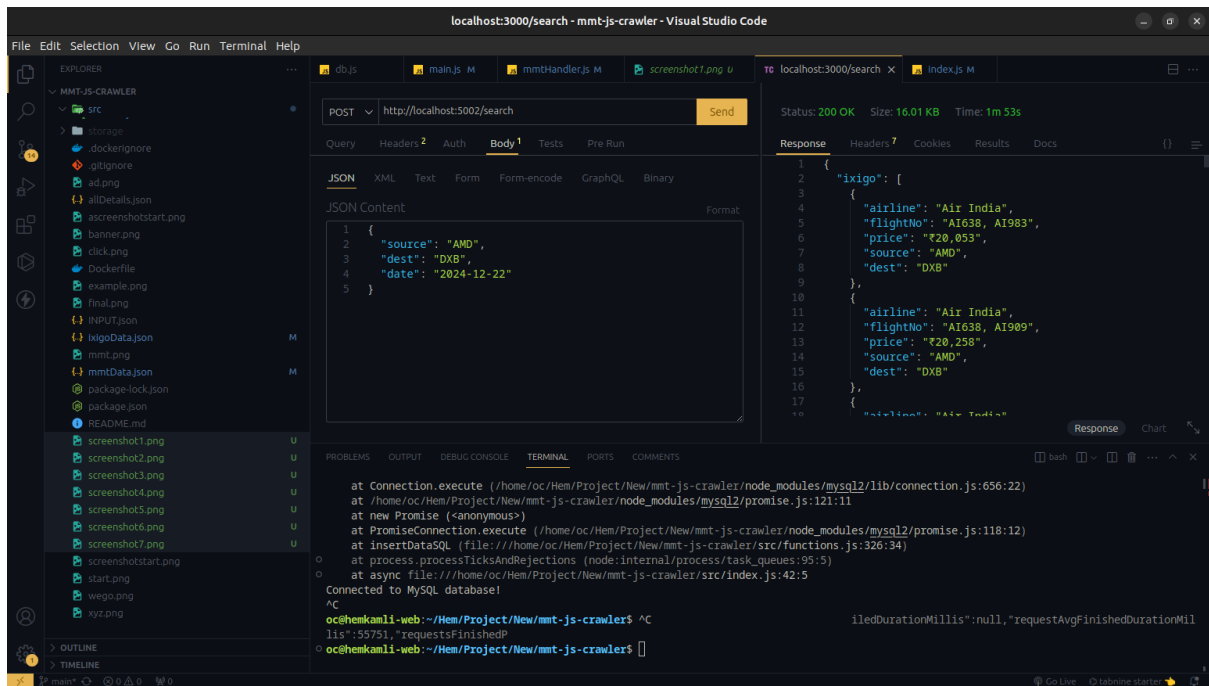
#	id	source	dest	flightNo	airline	price
1	1	AMD	DXB	3L 112	Air Ara...	₹ 20,781
2	2	AMD	DXB	G9 419	Air Arabia	₹ 23,451
3	3	AMD	DXB	AI 614, AI 983	Air India	₹ 26,895
4	4	AMD	DXB	3L 112	Air Ara...	₹ 20,781
5	5	AMD	DXB	G9 419	Air Arabia	₹ 23,451
6	6	AMD	DXB	AI 614, AI 983	Air India	₹ 26,525
7	7	AMD	DXB	AI 632, AI 909	Air India	₹ 26,895



- Table structures for the data store in MYsql.



- API call for searching dynamic data on multiple sites.



- Admin Dashboard to search dynamically route and scrap data

Flight Filter

Airline:

- ☐ AirIndia
- ☐ SpiceJet
- ☐ Vistara
- ☐ AKasha air
- ☐ Indigo

Reset Filters

From

To

dd-mm-yyyy

☐ Publish
☐ Cluster/TBF

☐ Saver
☐ Flexi

Scrap

History

Export

- Select/Enter departure Location

Flight Filter

Airline:

- ☐ AirIndia
- ☐ SpiceJet
- ☐ Vistara
- ☐ AKasha air
- ☐ Indigo

Reset Filters

AMD

To

dd-mm-yyyy

☐ Publish
☐ Cluster/TBF

☐ Saver
☐ Flexi

Scrap

History

Export

AMD

Ahmedabad

Sardar Vallabh Bhai Patel International Airport

BPX

Bangda

Qamdo Bangda Airport

SXK

Saumlaki-Yamdena Island

Mathiida Batlayeri Airport

- Select Departure Date for search

Flight Filter

Airline:

☐ AirIndia

☐ SpiceJet

☐ Vistara

☐ AKasha air

☐ Indigo

Reset Filters

AMD

To

dd-mm-yyyy

☐ Publish
 ☐ Saver
 ☐ Cluster/TBF
 ☐ Flexi

Scrap

History

Export

- Scrapped data and the comparission of multiple sites and calculating markup.

Flight Filter

Airline:

☐ AirIndia

☐ SpiceJet

☐ Vistara

☐ AKasha air

☐ Indigo

Reset Filters

From

To

dd/mm/yyyy

☐ Publish
 ☐ Saver
 ☐ Cluster/TBF
 ☐ Flexi

Scrap

History

Export

Departure Location	Departure Date	Arrival Location	Arrival Date	Airline Name	Direct	Flight No.	FairType	TBO Publis
Ahmedabad (AMD)	29 May 2024	New Delhi (DEL)	29 May 2024	Akasa Air	1	1145	Saver	4707
Ahmedabad (AMD)	29 May 2024	New Delhi (DEL)	29 May 2024	SpiceJet	1	8194	Publish	6324
Ahmedabad (AMD)	29 May 2024	New Delhi (DEL)	29 May 2024	Vistara	1	966	Publish	4900
Ahmedabad (AMD)	29 May 2024	New Delhi (DEL)	29 May 2024	Vistara	1	976	Publish	5215
Ahmedabad (AMD)	29 May 2024	New Delhi (DEL)	29 May 2024	Vistara	1	906	Publish	5215
Ahmedabad (AMD)	29 May 2024	New Delhi (DEL)	29 May 2024	Indigo	1	2736	Saver	5232
Ahmedabad (AMD)	29 May 2024	New Delhi (DEL)	29 May 2024	Indigo	1	2209	Saver	5286
Ahmedabad (AMD)	29 May 2024	New Delhi (DEL)	29 May 2024	Indigo	1	2047	Saver	5286
Ahmedabad (AMD)	29 May 2024	New Delhi (DEL)	29 May 2024	Indigo	1	2032	Saver	5286

CHAPTER: 8 CONCLUSION AND FUTURE WORK

CONCLUSION

In conclusion, the flight data scraping project presents a promising solution for streamlining the process of gathering and analyzing flight information. By centralizing data from various online platforms, the project aims to provide users with a convenient and comprehensive view of available flights, including pricing details and route options. The primary objective of simplifying the search for the best flight deals through an easy-to-use dashboard aligns with the needs of modern travelers. Future developments, such as expanding data sources and incorporating advanced analysis techniques, promise to further enhance the system's capabilities and user experience.

Overall, the project endeavors to evolve into a robust platform that empowers travelers with efficient and informed solutions for booking flights. By leveraging technology and building upon existing methodologies, the project contributes to the advancement of travel technology and enhances the travel booking experience for users.

FUTURE WORK

Future work for the travel rate scraping project includes expanding data sources, integrating advanced data analysis techniques, and incorporating user preferences for personalized recommendations. Real-time updates and mobile application development are suggested to enhance accessibility, while partnerships with travel agencies and airlines can improve service quality and access to exclusive deals. User feedback mechanisms will drive iterative improvements, ensuring the system remains responsive to evolving user needs and industry trends. Through these enhancements, the system can evolve into a robust platform, providing travelers with efficient and informed flight booking solutions.