A

Project Report

On

ONLINE FLIGHT PRICE PREDICTION

Submitted to

RAJIV GANDHI UNIVERSITY OF KNOWLEDGE AND TECHNOLOGIES
RK VALLEY

in partial fulfilment of the requirement for the award of the Degree of

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE & ENGINEERING

Submitted by

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Under the Guidance of

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RAJIV GANDHI UNIVERSITY OF KNOWLEDGE TECHNOLOGIES

(catering the Educational Needs of Gifted Rural Youth of AP)

R.K Valley, Vempalli(M), Kadapa(Dist) – 516330

2020 - 2024

RAJIV GANDHI UNIVERSITY OF KNOWLEDGE TECHNOLOGIES

(**A.P.Government Act 18 of 2008)**

RGUKT-RK Valley

Vempalli, Kadapa, Andhrapradesh - 516330.

CERTIFICATE OF PROJECT COMPLETION

This is to certify that I have examined the thesis entitled "**FLIGHT PRICE PREDICTION**" submitted by **y.Bannisha(O180948)** **P.SIREESHA(R180887)** our guidance and supervision for the partial fulfilment for the degree of Bachelor of Technology in computer Science and Engineering during the academic session JULY2023 – December 2023 at RGUKT-RKVALLEY.

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Vempalli, Kadapa, Andhrapradesh-516330.

DECLARATION

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declare that the project report entitled **"FLIGHT PRICE PREDICT** " one under guidance of **Mr. santhosh kumar** is submitted in partial fulfillment for the degree of Bachelor of Technology in Computer Science and Engineering during the academic session February 2023 – July 2023 at RGUKT-RK Valley. I also declare that

this project is a result of our own effort and has not been copied or imitated from any source. Citations from any websites are mentioned in the references. To the best of my knowledge, the results embodied in this dissertation work have not been submitted to any university or institute for the award of any degree or diploma.

Date :

Y.BANNISHA(O180948),
P.SIREESHA (R180887),

Place : RK Valley

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Last but not least I express my gratitude to my parents for their constant source of encouragement and inspiration for me to keep my morals high.

With Sincere Regards,

Y.BANNISHA(O180948)
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ABSTRACT

An Flight price prediction project aims tha helps flight price Prediction ha s become crucial tasks for travels and travel agencies Like.With the help of machine learning algorithms,We can develop Models that can accurately forecast the pricess of fligjts based on Various factors such as departure date,arrival date,Airline,and,historical. Pricing trends.

This project aims to implement a machine learning-based flight price Prediction system that can assist users in making informed decisions About flight bookings.The proposed system will utilize historical data Including information on past prices,flight routes,and airline perform -ance,to train a predictive model.

Overall,flight price prediction will be user friendly and accessible Users will be able to input thier desired travel details,such as departures Destination cities,travel dates,and preferred airlines.The system will Helping users make informed decsions about when to book thier flights,. Potentially saving them money and reducing the hassle of constantly Monitoring prices.

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CHAPTER 1

INTRODUCTION

1.1 Motivation

The motivation behind flight price prediction project in machine Learning is to help travelers and travel agencies make more informed. Decision booking flights.As you know,flight prices can fluctuate grately Based on various factors like the date of the travel,destination,and airline. By developing a machine learning model that can accurately prdict flight Prices,We can asist users in finding the best time to book thier flights,We Can assist users in finding the best to book their flights and potentially Save them momney.With the help of historical flight data and machine Learning algorithms,We can analyze patterns and trends to forecast future Prices.This can be especially beneficial for users who are flexible with the Thier travel dates or destinations..

The motivation behind this project is to making it easier for Everyone to find the best deals.

1.2Objective of Project :

The objective of this project is to provide flight price prediction project is Develop a model that can accurately forecat flight prices.
Expected achievements in order to fulfill the objectives are:

- By analyzing historical data and considering various factores such as Travel dates,destinations,and airlines.
- The mode predicts future flight prices with levelmof accuracy.
- this can help travel and trvale agencies make informed decisions.
- The ultimate goal is to enhance the overall travel experience by providing
- users with reliable price predictions and empowering them to make, Well-formed decisions.

1.3Features:

1. Historicsl data analysis

2.Machine learning algorithms

3.Feature Engineering

4.Data preprocessing.

5.Machine training and evoluation

6Taking out train Data

7.Real-time Data integration

CHAPTER 2
REQUIREMENT ANALYSIS

2.1 REQUIREMENT SPECIFICATIONS

2.1.1 HARDWARE CONFIGURATION :

Client Side :

Ram	512 MB
Hard Disk	10 GB
Processor	1.0 GHz

Server Side:

Ram	1 GB
Hard Disk	20 GB
Processor	2.0 GHz

2.1.2 Software requirement:

Front end	1.HTML 2.CSS 3.Data visualization libraries
Back end	Python,Flask
Database Server	Google FireBase
Web Browser	Firefox, Google Chrome, or any compatible
Operating System	Ubuntu, Windows
Software	Ubuntu, Windows

2.1.3 FUNCTIONAL REQUIREMENTS

Data collection:

➢ The system should be able to gather relevant data such as historical flight price.

Data preprocessing:

➢ The system should preprocesses the collected data by cleaning,transforming.

Machine learning Model:

➢ The system should train machine learning models using the preprocessed data.

Real-time prediction:

➢ The system should be able to provide real-time flight price predictions.

Model evaluation and improvement:

➢ The system should regularly evaluate performance of the machine learning.

User interface:

➢ The system should have a user-friendly interface that allows users to input flight Details,view predicted prices,and compare prices acrosss diffrent airlines.

2.1.4 NON-FUNCTIONAL REQUIREMENTS

- **Usability Requirement**

The system shall allow the users to access the system from the system using any web browsers. The system uses a web browsers as an interface. Since all users are familiar with the general usage of a website, no special training is required. The system is user friendly which makes the system easy.

- **Availability Requirement**

The system is available 100% for the user and is used 24 hrs a day and 365 days a year. The system shall be operational 24 hours a day and 7 days a week.

- **Efficiency Requirement**

Mean Time to Repair (MTTR) - Even if the system fails, the system will be recovered back up within an hour or less.

- **Accuracy**

The system should accurately provide real time information taking into consideration various concurrency issues. The system shall provide 100% access reliability.

- **Reliability Requirement**

The system has to be 100% reliable due to the importance of data and the damages that can be caused by incorrect or incomplete data.

2.5Technologies Used

2.5.1 **php:**

- PHP is hyper text preprocessor is a service -side scripting languvage.
- It is primarily used for web development.it is widely used to create dynamic Web pages and applications.
- PHP code is embedded within HTML code and is executed on the server Generating HTML output that is sent to the client's web browser.

2.5.2 **CSS:**

CSS is cascading style sheets is a styling language used to describe
The visual appearance and layout of web pages.it works alongside HTML
To define how elements on a webpage should be displayed.CSS allows you to control Aspects such as fonts,colors,spacing,positioning and more.

2.5.2 ***Features:***

Some features of CSS include:

- Selectors
- Cascading
- Box model
- Typography
- Colors and background
- Layout and positioning
- Transitions and Animations

2.5.3 HTML

- HTML(Hypertext Markup language)is the standard markup language Used for creating web pages. It provides the structure and content of a web Page by using various tags to define diffrent elements such as headings.
- Paragraphs,images,links,tables,forms,and more.
- HTML is the backbone of a webpage,organizing and presenting information In a hierachical manner.
- It works in conjuction with CSS and javascript to create dynamic and interactive Web experience.

2.5.4 Python:

- Python is a popular programming language for machine learning
  And is often used for developing the backend of flight price prediction
  Iprojects.
- It has a wide range of of libraries and frameworks such as Tensor flow,,
  Scikit-learn,and pandas,that faacilitates data processing,.
- Python has a large community and a vast ecosystem of libraries and
  Frameworks that make development easier and faster that facilaitates data
  Processing,Model training,and prediction.

2.5.5 Flask:

- Flask in python that are commonly used for building the backend of web applications
  These frameworks provide tools and libraries to handle routing.
- Request handling and and database interactions.it is light weight web.
  Framework for python.It provides a simple and flexible way to build
- Web applications .Flask follows the model-view-controller(MVC)
  Architectural pattern and allows developrer to create routes,handle HTTP
  Requests,and render HTML template.it also supports extensions for aading
  Functionalities like database,integration,authentication,and more.

CHAPTER 3
SYSTEM ARCHITECTURE

3.1 Context Diagram

A context diagram is a visual representation that shows the system you're focusing on as a single entity, surrounded by its external interfaces. It helps to illustrate the interactions between the system and its environment without diving into the internal details. Context diagrams are commonly used in software development, systems analysis, and business process modeling to provide a high-level overview of a system's interactions with external entities.

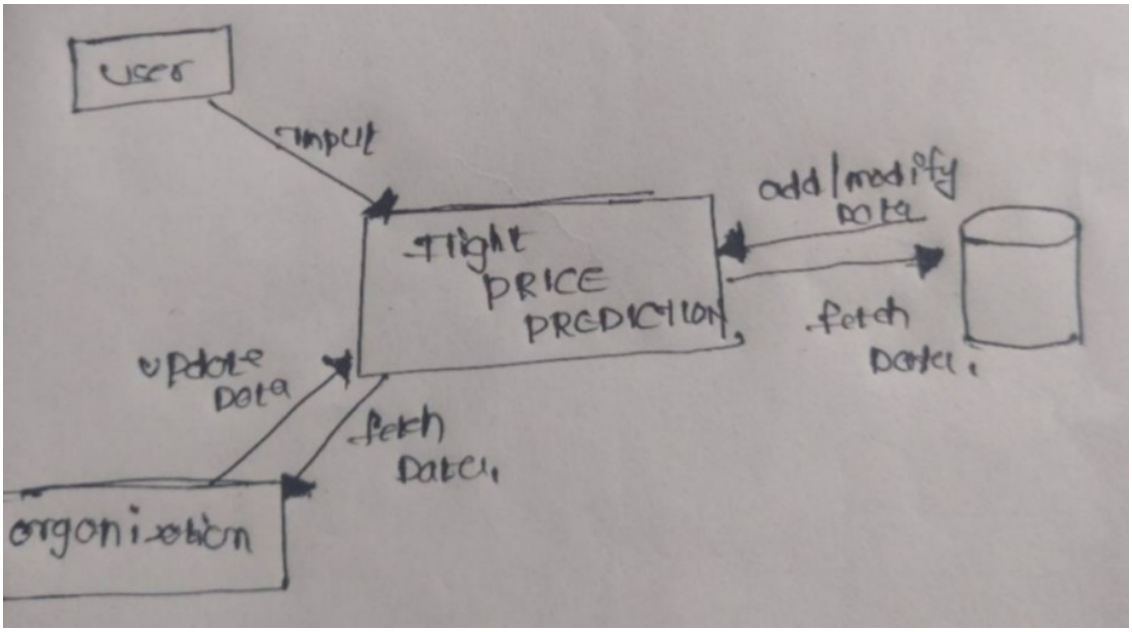


Figure 3.1.1: Context Diagram

3.2 Use case Diagram

A use case diagram is a type of diagram used in software development and systems engineering to visualize the interactions between users (actors) and a system's functionalities (use cases).

It provides a high-level view of how users interact with the system and the specific tasks the system can perform in response.

In a use case diagram, actors are represented as stick figures, and use cases are depicted as ovals. Arrows are used to show the communication between actors and use cases, indicating which functionalities the actors can access. It helps stakeholders understand the overall behavior and requirements of the system from a user's perspective. Use case diagrams are valuable tools for requirements analysis, project planning, and communication between project teams and stakeholders.

VIII. USE CASE DIAGRAM

Use Case Diagram of the project:

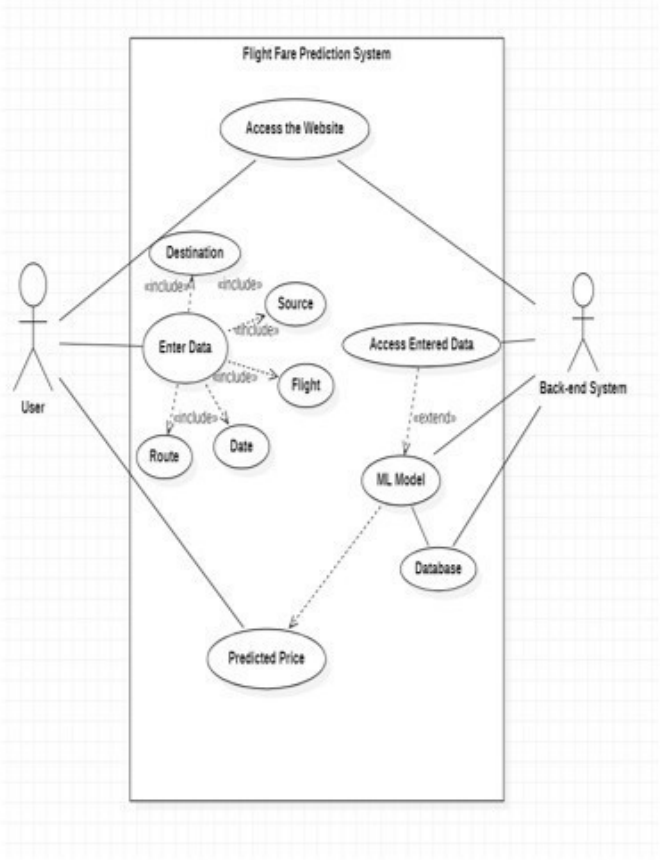
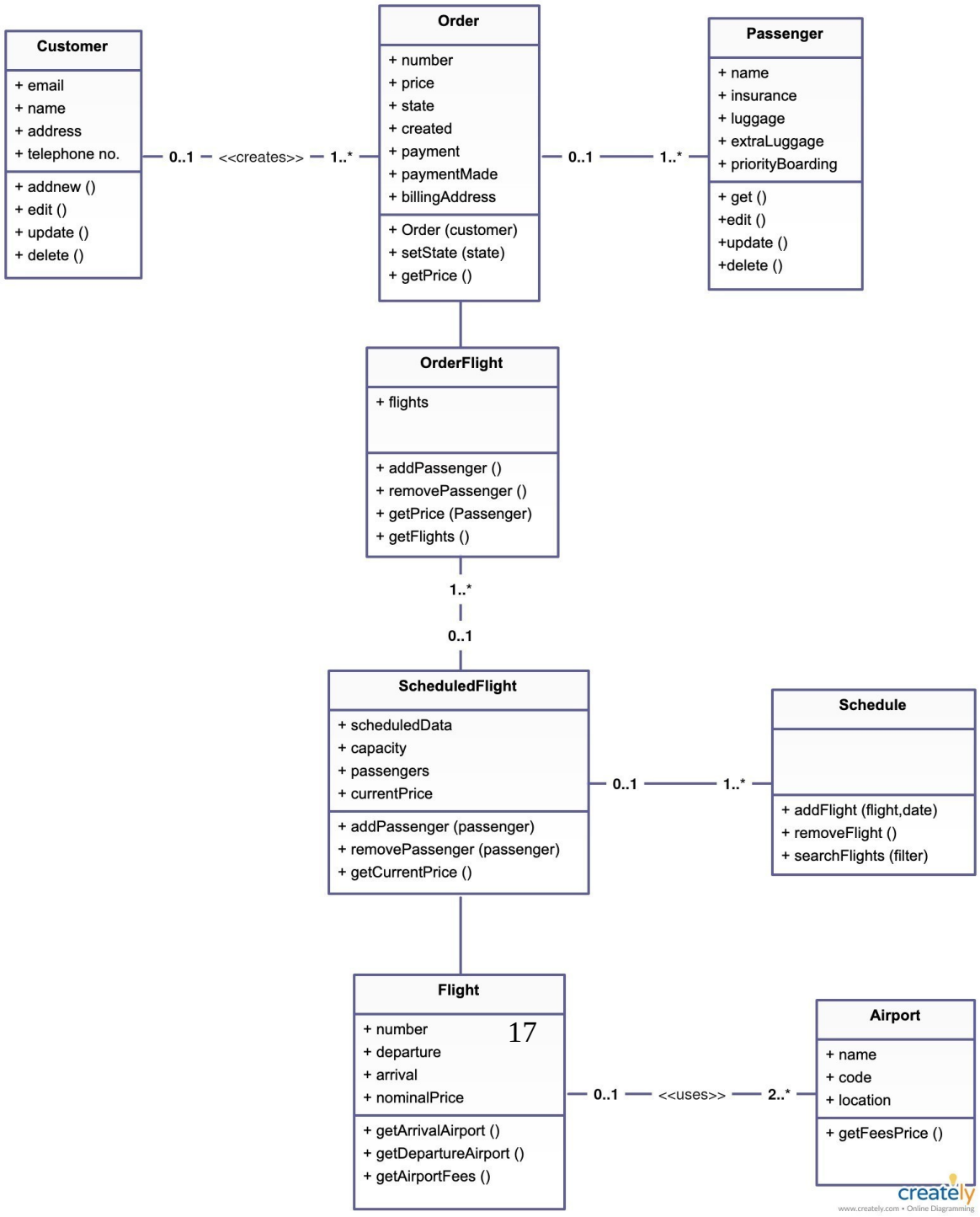


Fig. Use Case Diagram

Figure 3.2.1 : Use case Diagram

3.3 Class Diagram

Class diagrams are **the blueprints of your system or subsystem**. You can use class diagrams to model the objects that make up the system, to display the relationships between the objects, and to describe what those objects do and the services that they provide. Class diagrams are useful in many stages of system design.



CHAPTER 4

SOFTWARE ENVIRONMENT

4.1 FRONT-END AND BACK-END TECHNOLOGIES

On the front-end,you might use HTML,CSS,and javascript for building
The user interface and handling client-side interactions.Additionally

You could utilize a front-end framework like react or for a more efficient development Process.

- Code completion and inspection
- Advanced debugging
- Support for web programming and frameworks.

4.1.1 Features Of Front end and back end technologies

- Front-end technologies like HTML,CSS,and Javascript are used to create the user Interface and handle client -side interactions.
- They allow for the design and layout of web pages,the styling of elements and Implementation of interactive features.
- Back-end technologies ,on the other hand,are responsible for the server -side of web Applications .they handle the processing of data,business logic,and communication
- With databases.common back-end techonlogies include programming languages Like java,and php as well as web frame works.
  Front -end technologies focus on the presentation and user experience
- While back end technologis handle the behind-the scenes functionality and data procesiing.
- Together ,they work in harmony to create dynamic and interactive web applications.

CHAPTER 5

IMPLEMENTATION

5.1 : Model View Controller :

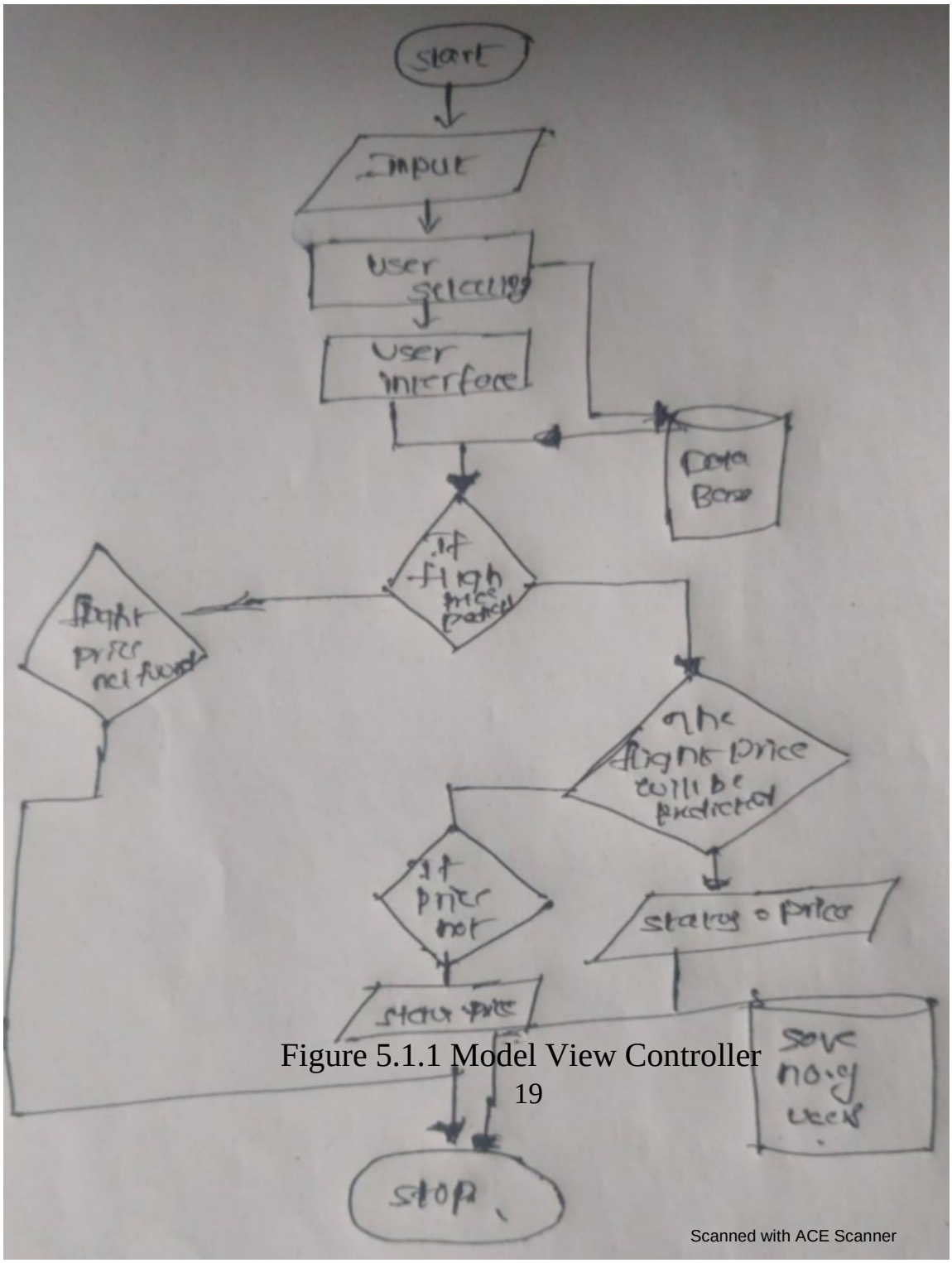


Figure 5.1.1 Model View Controller

5.2 : Project Planning:

For a successful software project, the following steps can be followed:

- Select a project
  - Identifying project's aims and objectives
  - Understanding requirements and specification
  - Methods of analysis, design and implementation
  - Testing techniques
  - Documentation.

- Project milestones and deliverables
- Budget allocation
  - Exceeding limits within control
- Project Estimates
  - Cost
  - Time
  - Size of code
  - Duration
- Resource Allocation
  - Hardware
  - Software
  - Previous relevant project information
- Risk Management
  - Risk avoidance
  - Risk detection

5.3 Detailed Design of Implementation

This phase of the systems development life cycle refines hardware and software specifications, establishes programming plans, trains users and implements extensive testing procedures, to evaluate design and operating specifications and/or provide the basis for further modification.

5.3.1 Technical Design

This activity builds upon specifications produced during new system design, adding detailed technical specifications and documentation.

5.3.2 Test Specifications and Planning

This activity prepares detailed test specifications for individual modules and programs, job streams, subsystems, and for the system as a whole.

5.3.3 Programming and Testing

This activity encompasses actual development, writing, and testing of program units or modules.

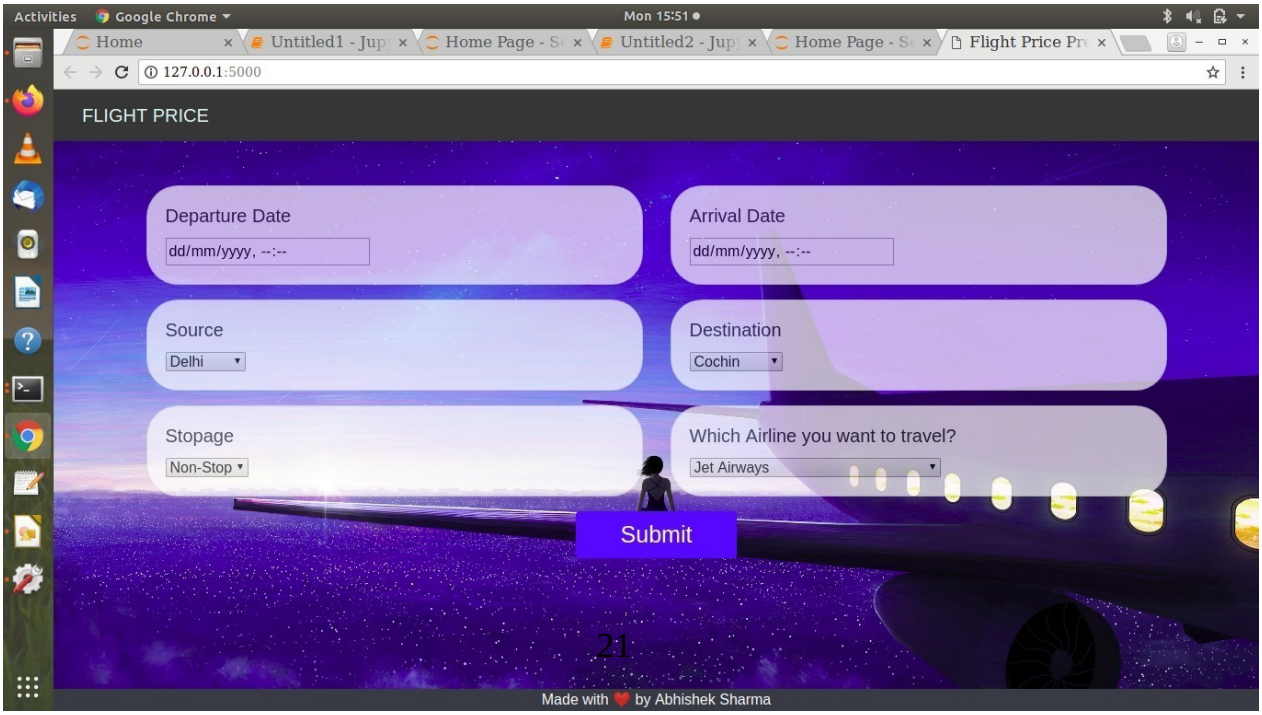
5.3.4 User Training

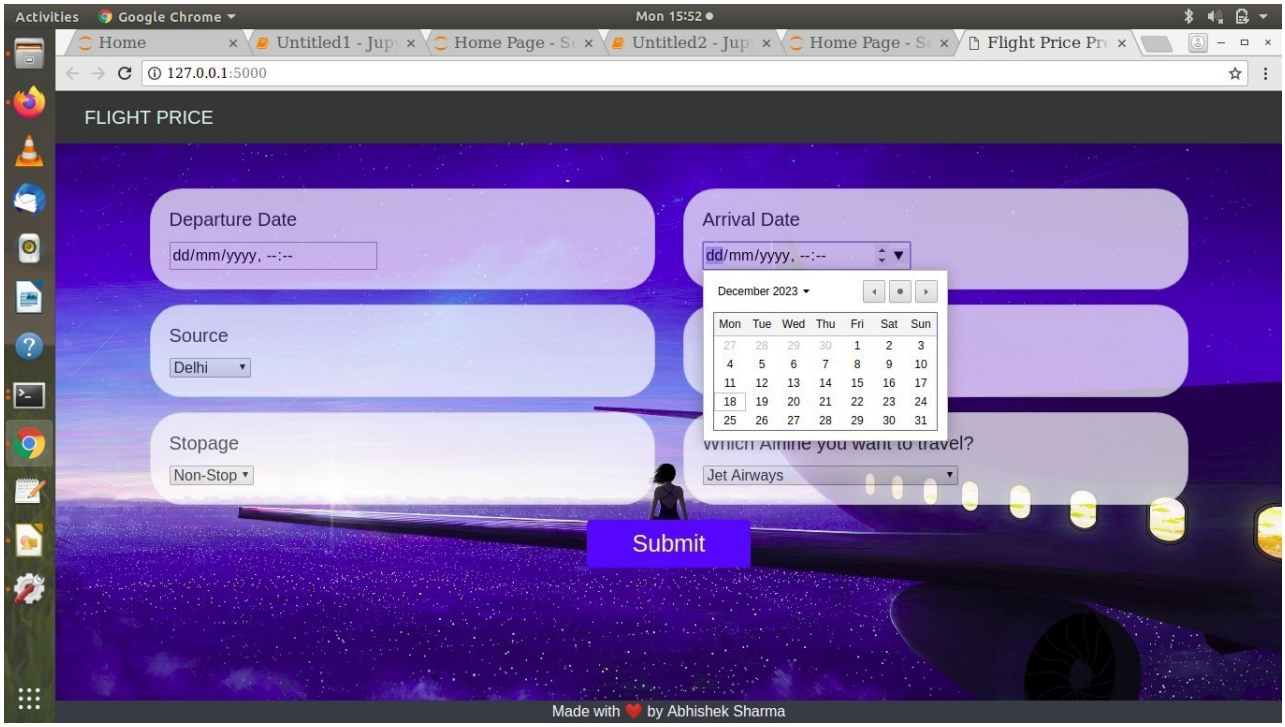
This activity encompasses writing user procedure manuals, preparation of user training materials, conducting training programs, and testing procedures.

5.3.5 Acceptance Test

A final procedural review to demonstrate a system and secure user approval before a system becomes operational.

5.4 Snapshots of online farming management system :




Activities
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Home Page - S
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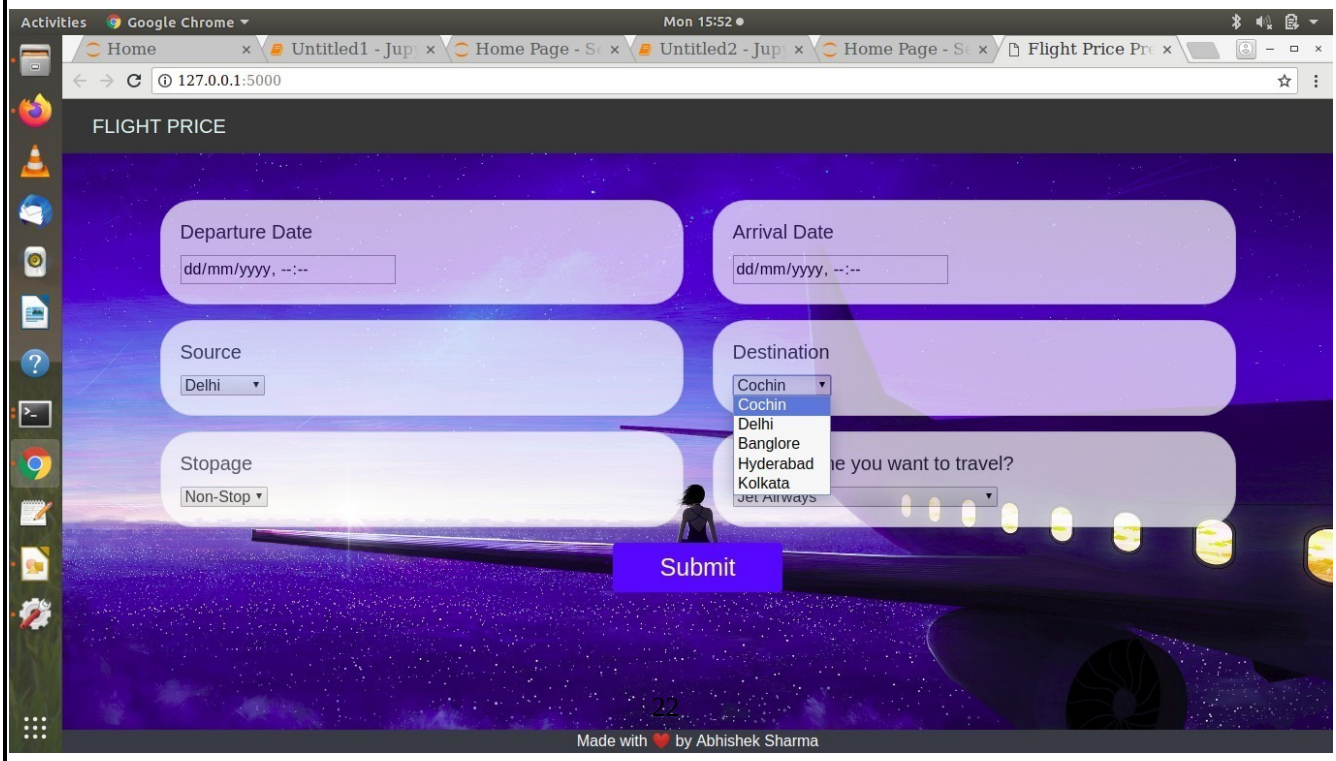
FLIGHT PRICE
Departure Date
dd/mm/yyyy, --:--
Arrival Date
dd/mm/yyyy, --:--
December 2023
Mon Tue Wed Thu Fri Sat Sun
27 28 29 30 1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
Source
Delhi
Stopage
Non-Stop
Which Airline you want to travel?
Jet Airways
Submit
Made with ❤ by Abhishek Sharma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Jet Airways
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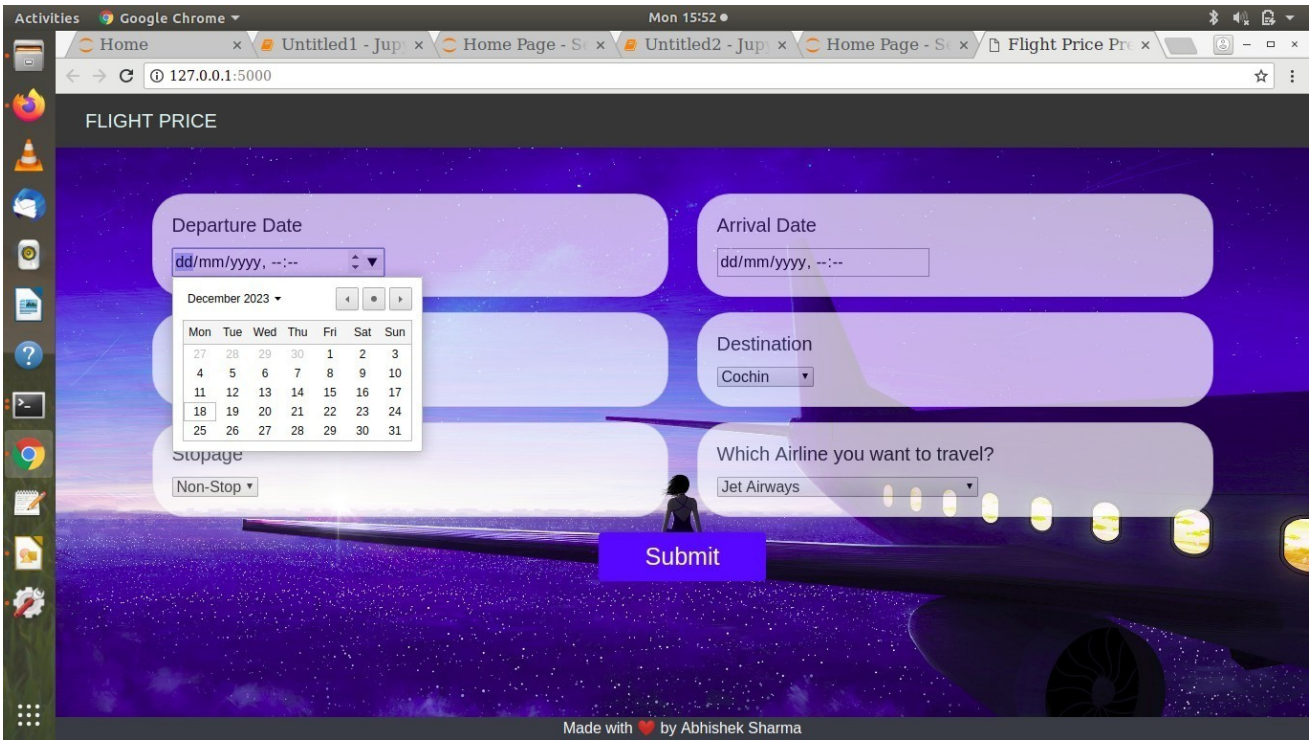


Figure.5.4.3 picture of selecting departure times

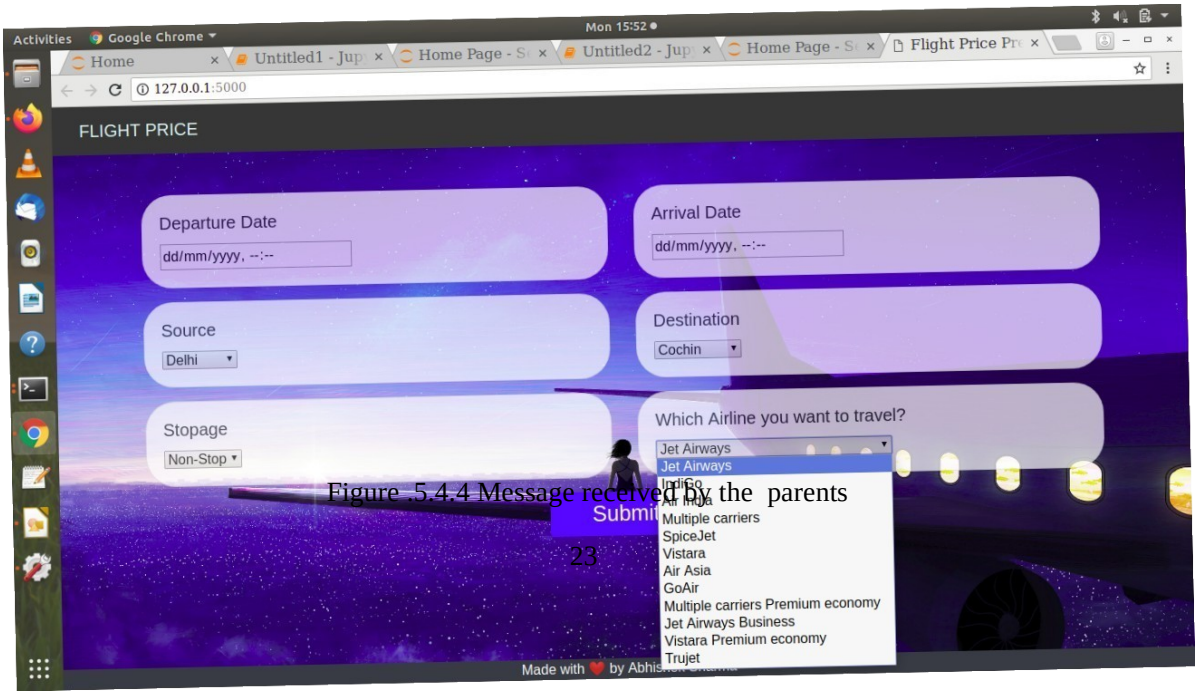
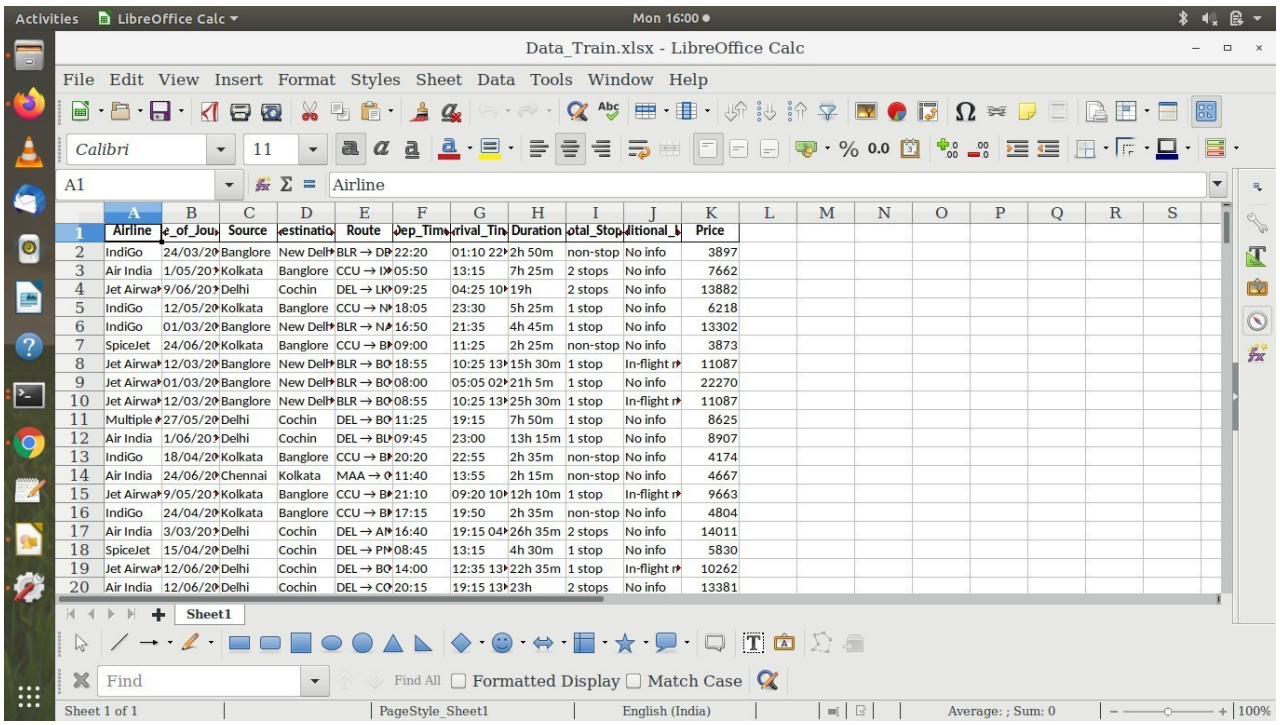
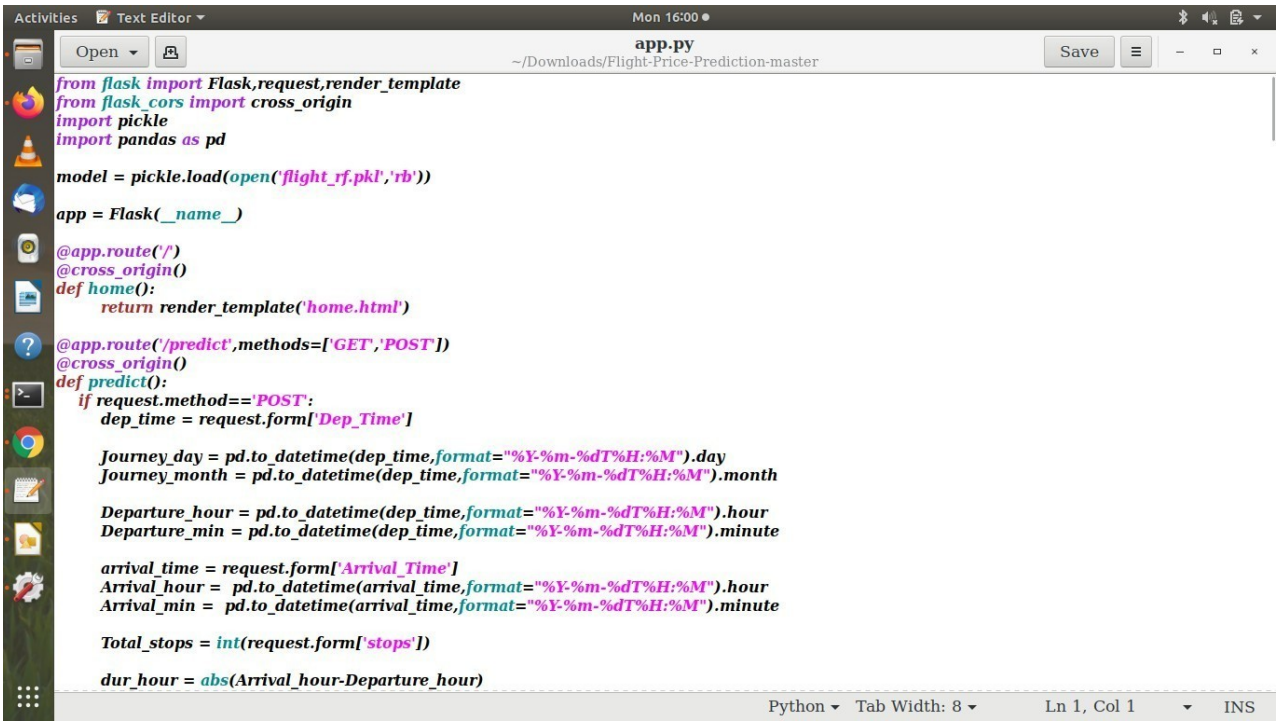


Figure .5.4.4 Message received by the parents



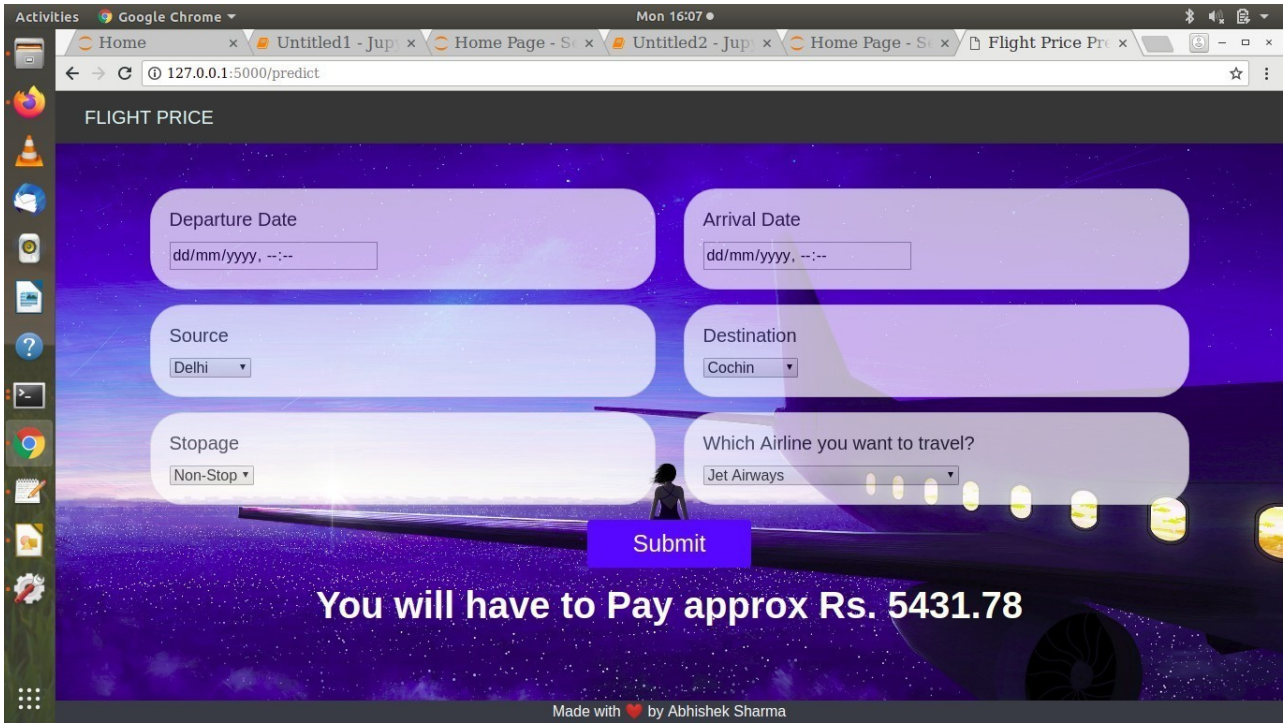
	A	B	C	D	E	F	G	H	I	J	K
1	Airline	e_of_Jou	Source	estinatio	Route	dep_Time	rival_Tin	Duration	otal_Stop	ditional_I	Price
2	IndiGo	24/03/20	Banglore	New Delh	BLR → DE	22:20	01:10 22	2h 50m	non-stop	No info	3897
3	Air India	1/05/20	Kolkata	Banglore	CCU → IX	05:50	13:15	7h 25m	2 stops	No info	7662
4	Jet Airwa	9/06/20	Delhi	Cochin	DEL → LK	09:25	04:25 10	19h	2 stops	No info	13882
5	IndiGo	12/05/20	Kolkata	Banglore	CCU → N	18:05	23:30	5h 25m	1 stop	No info	6218
6	IndiGo	01/03/20	Banglore	New Delh	BLR → NA	16:50	21:35	4h 45m	1 stop	No info	13302
7	SpiceJet	24/06/20	Kolkata	Banglore	CCU → BH	09:00	11:25	2h 25m	non-stop	No info	3873
8	Jet Airwa	12/03/20	Banglore	New Delh	BLR → BO	18:55	10:25 13	15h 30m	1 stop	In-flight r	11087
9	Jet Airwa	01/03/20	Banglore	New Delh	BLR → BO	08:00	05:05 02	21h 5m	1 stop	No info	22270
10	Jet Airwa	12/03/20	Banglore	New Delh	BLR → BO	08:55	10:25 13	25h 30m	1 stop	In-flight r	11087
11	Multiple	27/05/20	Delhi	Cochin	DEL → BO	11:25	19:15	7h 50m	1 stop	No info	8625
12	Air India	1/06/20	Delhi	Cochin	DEL → BL	09:45	23:00	13h 15m	1 stop	No info	8907
13	IndiGo	18/04/20	Kolkata	Banglore	CCU → BH	20:20	22:55	2h 35m	non-stop	No info	4174
14	Air India	24/06/20	Chennai	Kolkata	MAA → C	11:40	13:55	2h 15m	non-stop	No info	4667
15	Jet Airwa	9/05/20	Kolkata	Banglore	CCU → BH	21:10	09:20 10	12h 10m	1 stop	In-flight r	9663
16	IndiGo	24/04/20	Kolkata	Banglore	CCU → BH	17:15	19:50	2h 35m	non-stop	No info	4804
17	Air India	3/03/20	Delhi	Cochin	DEL → AM	16:40	19:15 04	26h 35m	2 stops	No info	14011
18	SpiceJet	15/04/20	Delhi	Cochin	DEL → PN	08:45	13:15	4h 30m	1 stop	No info	5830
19	Jet Airwa	12/06/20	Delhi	Cochin	DEL → BO	14:00	12:35 13	22h 35m	1 stop	In-flight r	10262
20	Air India	12/06/20	Delhi	Cochin	DEL → CO	20:15	19:15 13	23h	2 stops	No info	13381

Figure .5.4.5 List of datasets




```
from flask import Flask,request,render_template
from flask_cors import cross_origin
import pickle
import pandas as pd

model = pickle.load(open('flight_rf.pkl','rb'))

app = Flask(__name__)

@app.route('/')
@cross_origin()
def home():
        return render_template('home.html')

@app.route('/predict',methods=['GET','POST'])
@cross_origin()
def predict():
    if request.method=='POST':
        dep_time = request.form['Dep_Time']

        Journey_day = pd.to_datetime(dep_time,format="%Y-%m-%dT%H:%M").day
        Journey_month = pd.to_datetime(dep_time,format="%Y-%m-%dT%H:%M").month

        Departure_hour = pd.to_datetime(dep_time,format="%Y-%m-%dT%H:%M").hour
        Departure_min = pd.to_datetime(dep_time,format="%Y-%m-%dT%H:%M").minute

        arrival_time = request.form['Arrival_Time']
        Arrival_hour =  pd.to_datetime(arrival_time,format="%Y-%m-%dT%H:%M").hour
        Arrival_min =  pd.to_datetime(arrival_time,format="%Y-%m-%dT%H:%M").minute

        Total_stops = int(request.form['stops'])

        dur_hour = abs(Arrival_hour-Departure_hour)
```

Figure .5.4.6 image of app.pyl



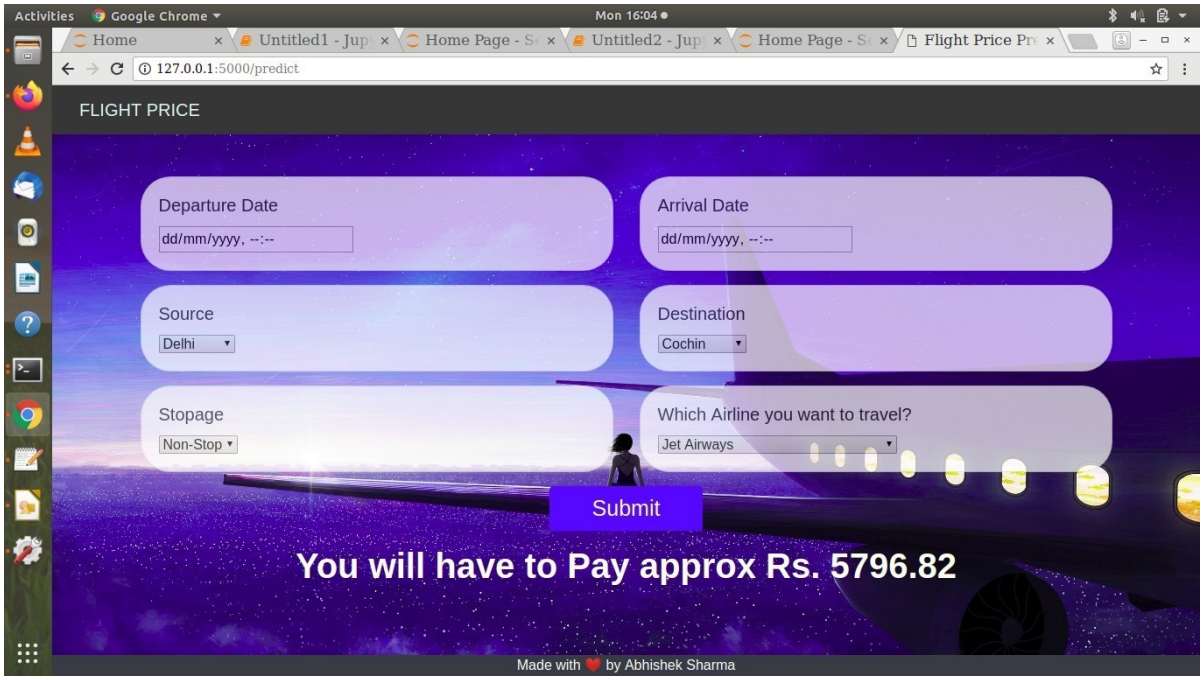


Figure of approx flight price prediction

CHAPTER 6
CONCLUSION & FUTURE SCOPE

6.1 Conclusion Of Project:

We are conclude that the online flight price prediction project in Machine learning can be a valuable tool for travelers.by levering historical Flight data,weather information,and other relevant factors,the project can Accurately predict flight prices in real-time.
The machine learning models used in the project are trained to analyze And interpret data,enabling them to make informde decisions about book Thier flights.

This application improves provide travellers with a reliable tool for Making informed decisions about their flights.

At the end it is concluded that we have made effort on this points

- A description of the background and context of the project and its relation to work already done in the area.
- Made statement of the aims and objectives of the project.
- The description of Purpose, Scope, and applicability.
- We define the problem on which we are working in the project.
- We describe the requirement Specifications of the system and the actions that can be done on these things.
- We understand the problem domain and produce a model of the system, which describes operations that can be performed on the system.

- ➢ We included features and operations in detail, including screen layouts.
- ➢ Finally the system is implemented and tested according to test cases.

6.2 Future Scope

In a nutshell, it can be summarized that the future scope of the project circles around maintaining information regarding:

- ❖ We can add printer in future.
- ❖ We can give more advance software for FLIGHT PRICE PREDICTION including more facilities.
- ❖ We will host the platform on online servers to make it accessible worldwide.
- ❖ Integrate multiple load balancers to distribute the loads of the system.
- ❖ Implement the backup mechanism for taking backup of codebase and database on regular basis on different servers.

The above-mentioned points are the enhancements which can be done to increase the applicability and usage of this project. Also, as it can be seen that now-a-days the players are versatile, i.e. so there is a scope for introducing a method to maintain the Safety of the Students Enhancements can be done to maintain all the aspects.

We have left all the options open so that if there is any other future requirement in the system by the user for the enhancement of the system then it is possible to implement them. In the last we would like to thanks all the persons involved in the development of the system directly or indirectly. We hope that the project will serve its purpose for which it is develop there by underlining success of process.

CHAPTER 7
REFERENCES

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