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Faculty of Engineering  
Department of Mechanical Engineering

**MC2202 – Programming for Mechatronic Systems**  
**Continuous Assessment Project Report**

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# **INTRODUCTION**

## ❖ Project Overview:

This python-based programming project aims to develop a ticket billing machine specifically designed for a local transportation system. The machine allows passengers to book tickets between predefined locations, calculate the fare based on the distance, process payments, and provide change if necessary. Additionally, the system collects customer feedback through a rating system, enhancing the user experience and providing insights for further improvements.

## ❖ Purpose and Goals:

The primary goal of this project is to automate the ticket booking and payment process, thereby reducing manual work and minimizing human error. The system aims to streamline ticket purchases, making it quick, easy, and efficient for users. The feedback functionality is incorporated to gather customer satisfaction levels, which could help improve the quality of service in the long term.

## **SYSTEM DESCRIPTION**

### **❖ Key Functions of the System:**

- **Location Selection:**

The system offers a selection of locations, allowing users to choose their start and end destinations. The fare is calculated based on predefined distances between these locations.

- **Fare Calculation:**

A function calculates the ticket price dynamically based on the selected start and end points, using a dictionary of distances. This ensures accurate fare computation and transparency in pricing.

- **Payment Processing:**

After calculating the fare, users enter the payment amount. The system checks if the payment is sufficient and provides the calculated change if there is any excess. This function ensures a smooth and error-free payment process.

- **Feedback Collection:**

The system includes a review section where users can rate their experience on a scale of 1 to 5 stars. This feedback functionality helps gauge customer satisfaction and could be used for service quality improvement.

- **Form Reset:**

A reset button allows users to clear all entered data and start over. This is useful for multiple transactions, as it quickly resets the form to the default state.

❖ **Specific Functions Used:**

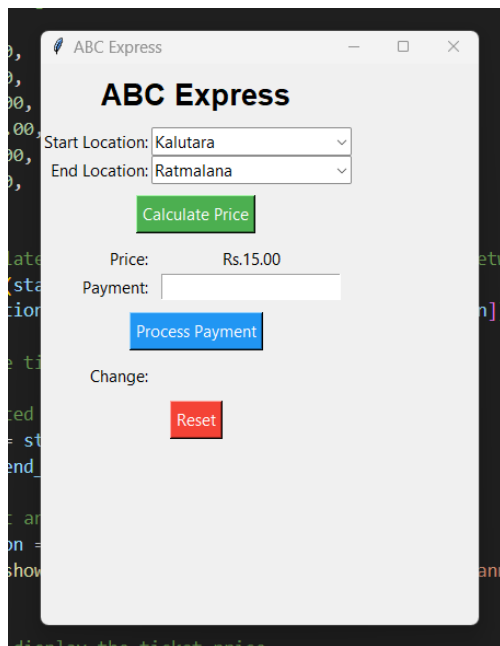
- **calculate\_price()**: Calculates the fare based on the distance between the start and end locations.
- **book\_ticket()**: Validates the locations selected, calculates the fare, and displays it.
- **process\_payment()**: Validates the payment, calculates change if payment exceeds the fare, and prompts a success message.
- **show\_review\_section()**: Displays the rating options after payment is successfully processed.
- **submit\_review()**: Collects the user rating and provides a confirmation message.
- **reset\_form()**: Clears all inputs, resetting the form for a new transaction.

## EVIDENCE OF FUNCTIONALITY

### Demonstrating Functionality:

- **Fare Calculation**

The user selects different start and end points, the fare displayed dynamically changes based on the distance. This demonstrates that the fare calculation function works as intended. Example screenshots given below.



ABC Express

Start Location: Kalutara

End Location: Ratmalana

Calculate Price

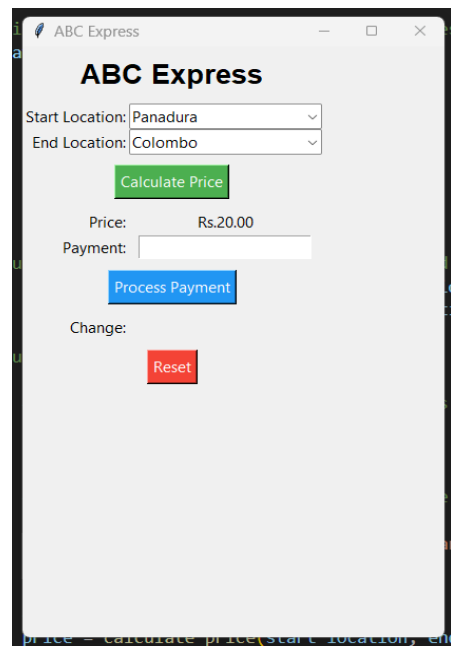
Price: Rs.15.00

Payment:

Process Payment

Change:

Reset



ABC Express

Start Location: Panadura

End Location: Colombo

Calculate Price

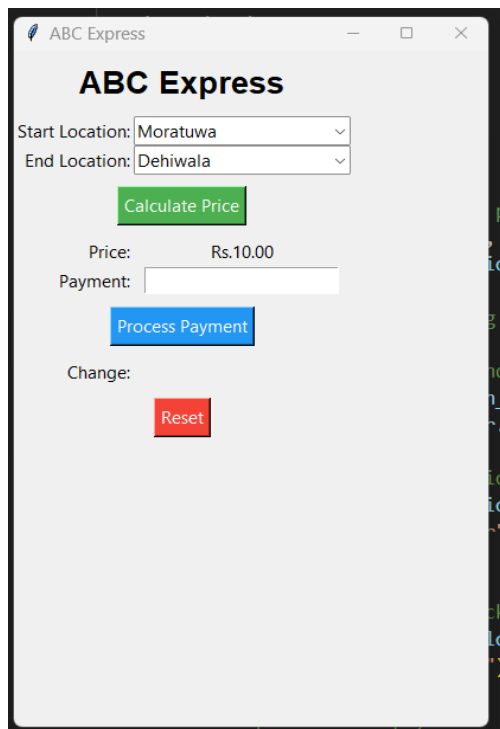
Price: Rs.20.00

Payment:

Process Payment

Change:

Reset



ABC Express

Start Location: Moratuwa

End Location: Dehiwala

Calculate Price

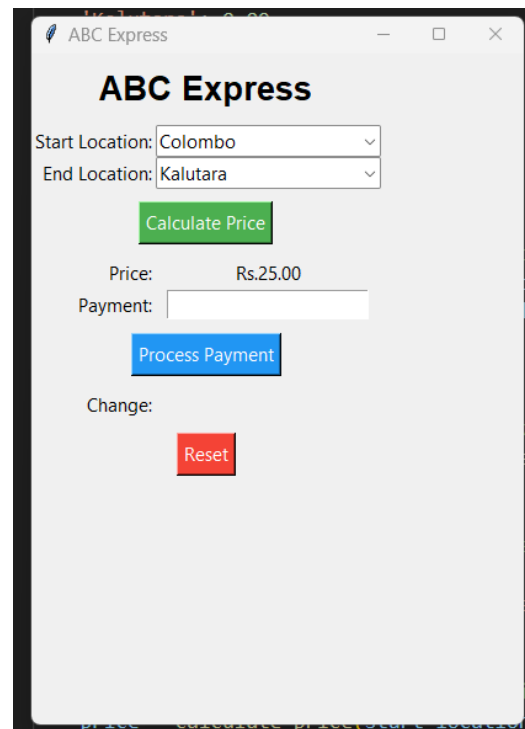
Price: Rs.10.00

Payment:

Process Payment

Change:

Reset



ABC Express

Start Location: Colombo

End Location: Kalutara

Calculate Price

Price: Rs.25.00

Payment:

Process Payment

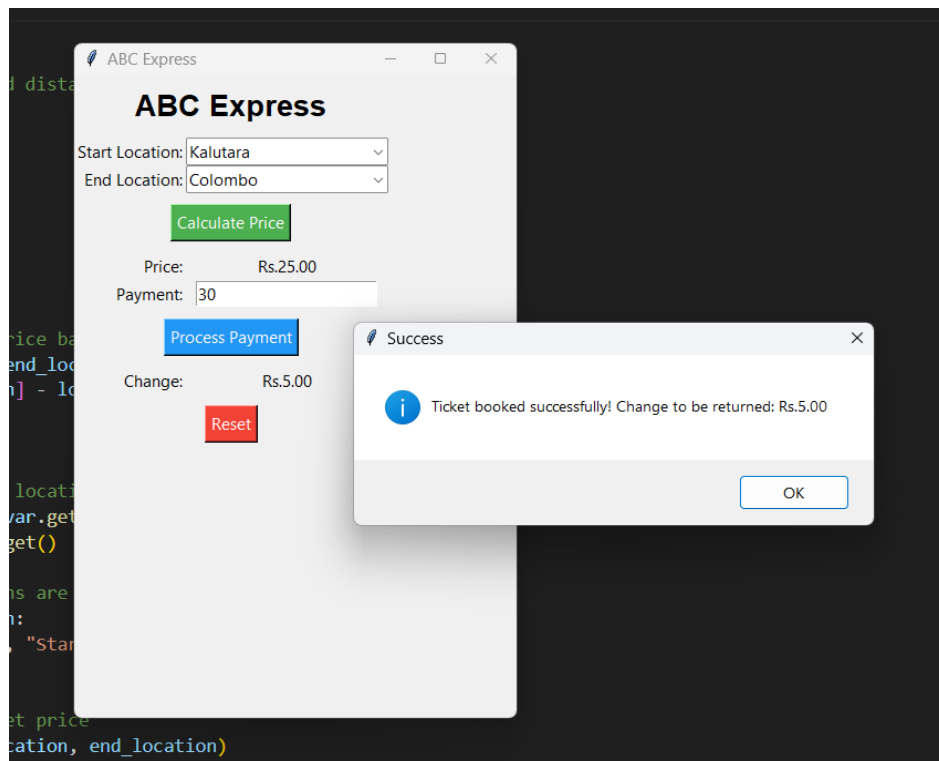
Change:

Reset

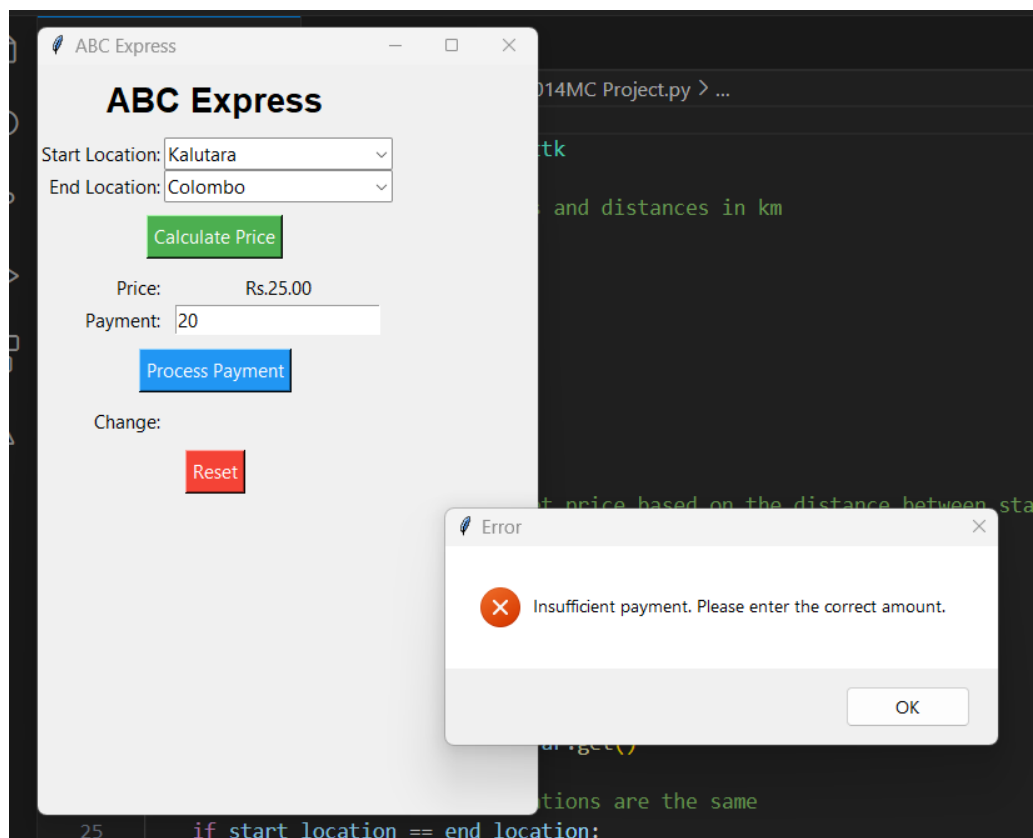
- **Payment Processing**

After Calculating the fare, the user should enter the amount that have to be paid.

If the entered value is more than the fare, the change will be displayed.

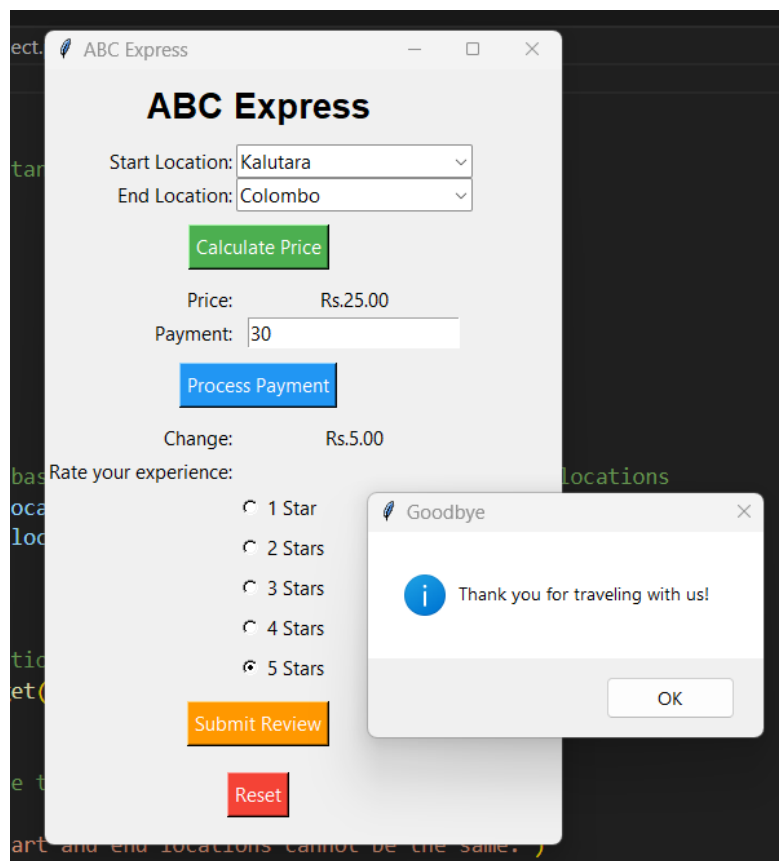
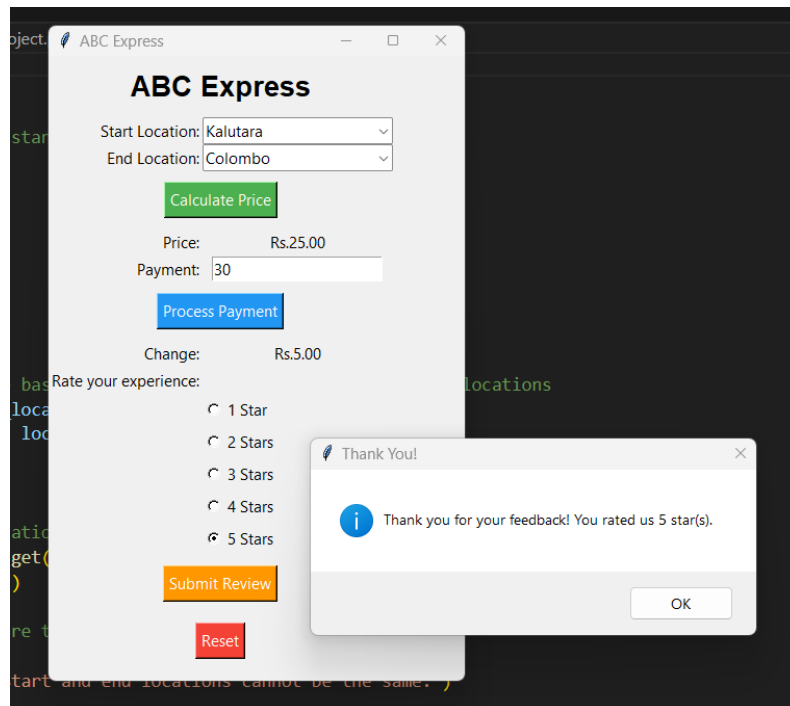


If the given amount is less than the fare, an error message will be displayed.



- **Feedback Collection**

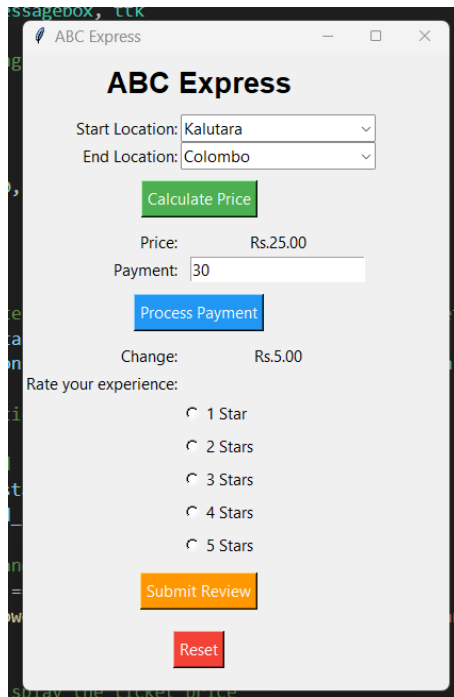
After a successful payment, users can select a star rating and submit their feedback. This highlights the system's ability to collect user ratings.



- **Form Reset**

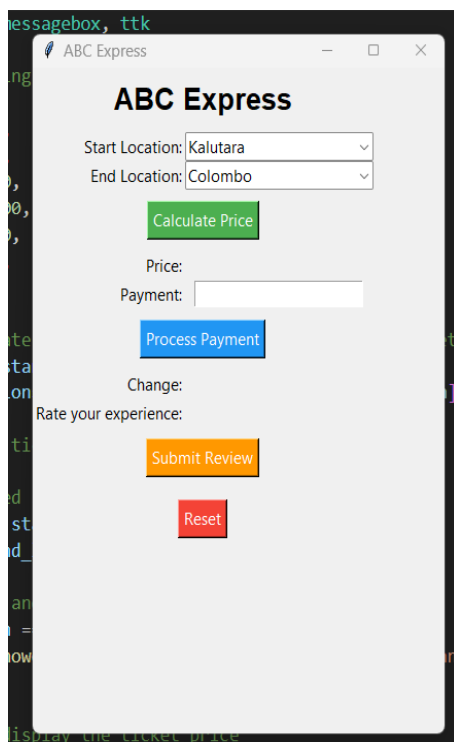
The reset functionality demonstrates how the form clears itself, resetting all fields to their default values. This ensures that the reset function operates as expected.

Before press the Reset button;



The screenshot shows a web application window titled "ABC Express". It contains the following elements: "Start Location:" with a dropdown menu showing "Kalutara", "End Location:" with a dropdown menu showing "Colombo", a green "Calculate Price" button, "Price:" with the value "Rs.25.00", "Payment:" with an input field containing "30", a blue "Process Payment" button, "Change:" with the value "Rs.5.00", "Rate your experience:" with radio buttons for "1 Star", "2 Stars", "3 Stars", "4 Stars", and "5 Stars", an orange "Submit Review" button, and a red "Reset" button at the bottom.

After pressing the Reset button;



The screenshot shows the same "ABC Express" web application window after the "Reset" button has been pressed. The "Start Location:" dropdown still shows "Kalutara" and the "End Location:" dropdown still shows "Colombo". The "Calculate Price" button is still green. The "Price:" label is present, but the input field is now empty. The "Payment:" input field is also empty. The "Process Payment" button is still blue. The "Change:" label is present, but the input field is now empty. The "Rate your experience:" section with its radio buttons is still present. The "Submit Review" button is still orange. The "Reset" button is still red.



## **CONCLUSION**

This project successfully demonstrates the application of Python programming in automating a ticket billing system for a local transportation setup. By implementing key functions like location selection, fare calculation, payment processing, and feedback collection, this system provides a streamlined experience for users while reducing manual work and the possibility of human error. The project achieved its primary goal of making ticket purchasing quick, efficient, and user-friendly. Additionally, the feedback system offers a valuable tool for assessing customer satisfaction, which could inform future improvements in service quality. Overall, this project exemplifies how programming solutions can enhance operational efficiency and customer satisfaction in public transportation.