University of Science and Technology of Hanoi

ICT Department


# Project Report

# Train Management System

Group 11

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# 1 Introduction

## 1.1 Overview

Nowadays, the train is one of the most important transportation all around the world. Therefore, the need of making a logical, easy-to-control system for all activities related to the railway is fundamental across the countries.

Train Management System is a system implemented for the integrated management and monitoring of suburban train movements and signaling, as well as planning train routes and diversions.

## 1.2 The Importance of Train Management System

In real situations, the Train Management System can help administrators and customers in:

- Keeping all information up-to-date.
- Editing details about trains/clients timely (for administration purpose).
- Making a logical system for better management, from both administrators and clients sides.

## 1.3 Requirements

In this project, the scope for Train Management System will be Vietnam Railway.


Figure 1: Vietnam Railway Map

The Train Management System will be used for two particular objects: Administrators and Customers:

#### 1.3.1 Administrators

- Administrators can search for every train-related information such as name of the trains, all stations across Vietnam, schedules, and so on.
- Administrators can access all information about clients (e.g. Name, ID/Passport Number, Email/Phone Number, Reservation Code, Train Placements, etc.). They can also do several functions like change, delete, or rearrange those information if needed.

#### 1.3.2 Customers

- Customers will have access to see available trains that suit there need.
- From Train Management System, Customers can buy tickets.
- Customers can check their purchased tickets.

# 2 Structure

## 2.1 Approach

In this project, the following tools will be used:

- **Programming Language:** Python
- **Database:** SQLite
- **Backend Server:** Django
- **UI Module:** Tkinter

## 2.2 Database Schema

The database of this project contains six tables: **Station, Schedule, Route, Train, Seats,** and **Ticket**. Here is the detailed presentation in each table.

| Table | Description |
|---|---|
| Station | Contain the detailed information of the stations(FK: StationId) |
| Schedule | Contain the detailed information of every trip(FK: ScheduleId) |
| Route | Contain the detailed information related to train route(FK: RouteId) |
| Train | Contain the detailed information of every train(FK: TrainId) |
| Seats | Contain the detailed information of every seat in the train(FK: SeatsId) |
| Ticket | Contain the detailed information of the ticket for each trip(FK:TicketId) |

The image below is the Database Schema of Train Management System.

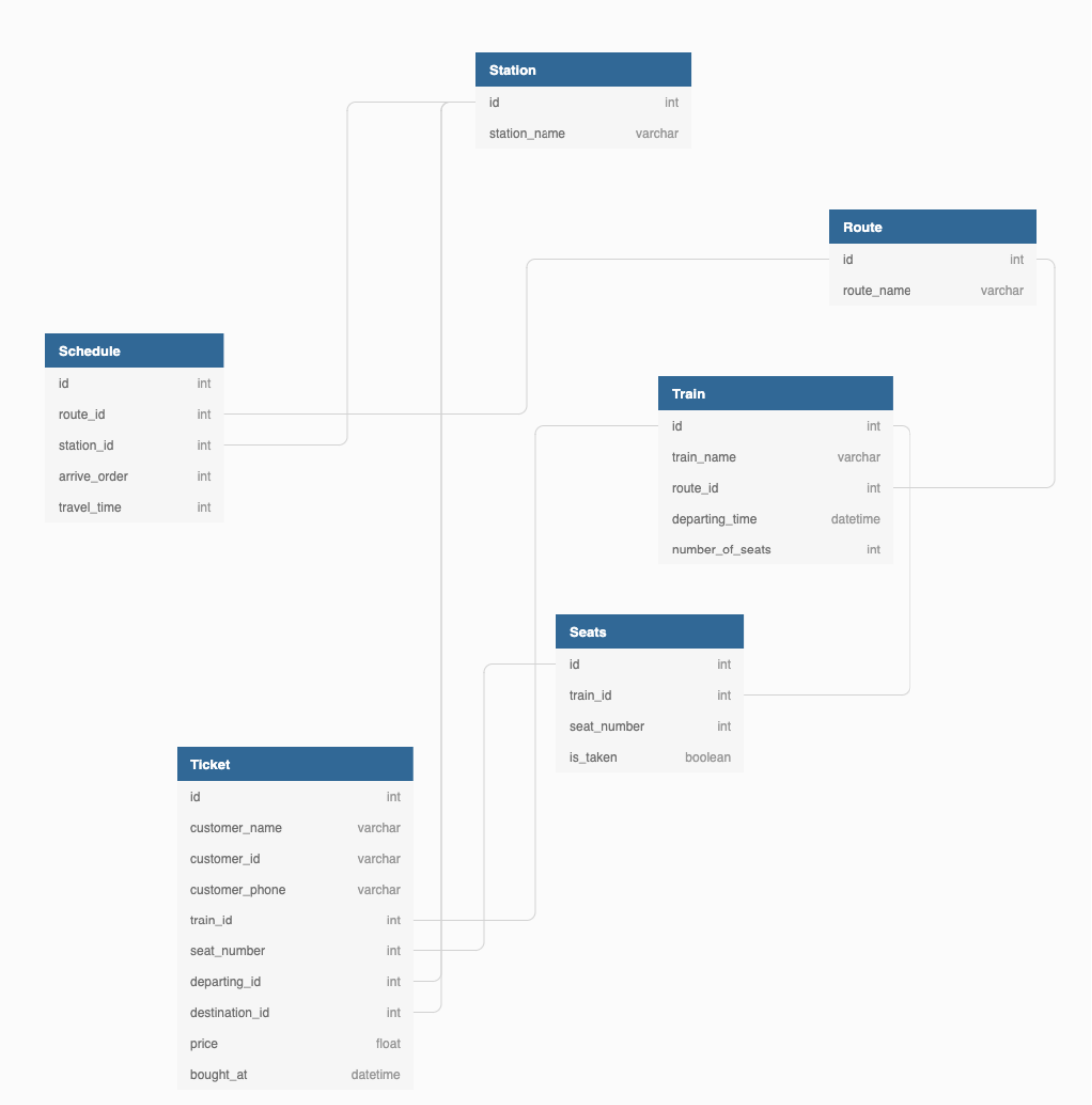


Figure 2: Database Schema

## 2.3 Features

The project contains a total of screens which are **Home, Find Ticket, Reservation Information** and **Admin.**

- **Home:** Give the general information about railway.
- **Find Ticket:** Function for customers to check for their suitable train route.
- **Reservation Information:** Function for customers to check for their ticket code.
- **Admin:** Management system for administrators.

### 2.3.1 Home

Home screen shows some general information about railway.

### 2.3.2 Find Ticket

The action on this function can be described as below:

- When clicking on **Find Ticket**, customers can search for a suitable route by choosing the starting and destination station. They also can check for one-way or round-trip, as well as the day they want to go.
- After choosing all the needed information, the system will bring them to the list of suitable trips. After choosing the trip they want to go, customers can choose the seat
- Next, they will add their personal information, the payment method.
- After finishing all steps above, the process of buying the ticket is done.

### 2.3.3 Reservation Information

The action on the function **Reservation Information** can be described as below.

- Customers can search for their reservation information by using their ID or Passport Number.
- The results will show as a table of their personal information, as well as their reservation on every trip before.

### 2.3.4 Admin

Before going to the main administration screen, the managers have to log in with the proper username and password. The administration screen is divided into 2 main parts: **Dashboard** and **Train Information**

- Dashboard
  - After logging in, the **dashboard** will be shown at first, with the general information of every train, which can help administrators to have a big view of what is happening right the time they're on.
  - When clicking on a particular train, they can have the access to view all information related, and some immediate function will be served for editing.
- Train Information
  - When clicking on **Train Information**, the administrators have two options: **Train** and **Customer**. They can choose one of them to edit.
  - For the **Train** option, administrators can have several functions (e.g. editing, searching, deleting, or adding) the information about the train (e.g. the order of seats, the starting time, destination, etc.). They also can add new trains or delete existing trains when needed.
  - For the **Customer** option, administrators can also have many functions to access and control the particular information of customers.

## 2.4 Results

### 2.4.1 Administrators

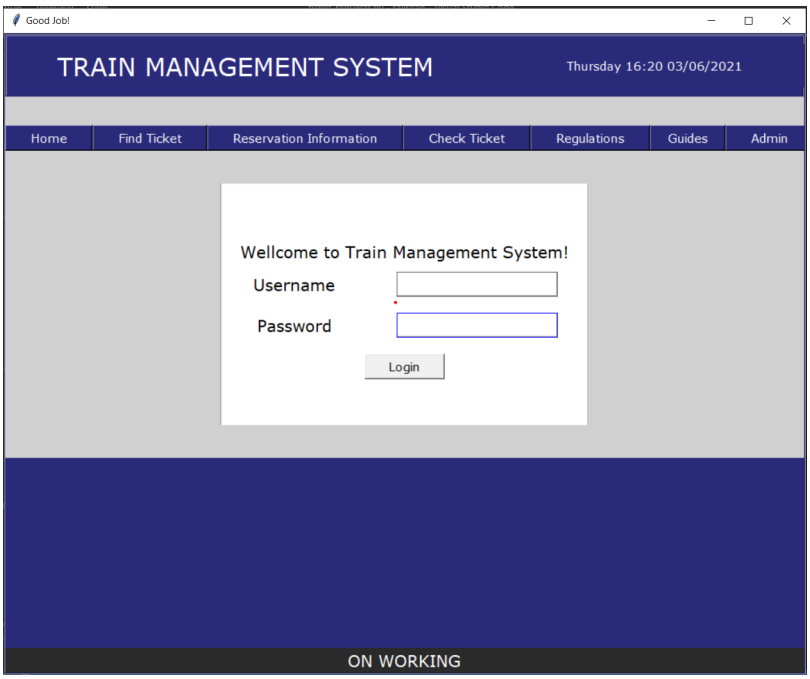


Figure 3: Log In Session

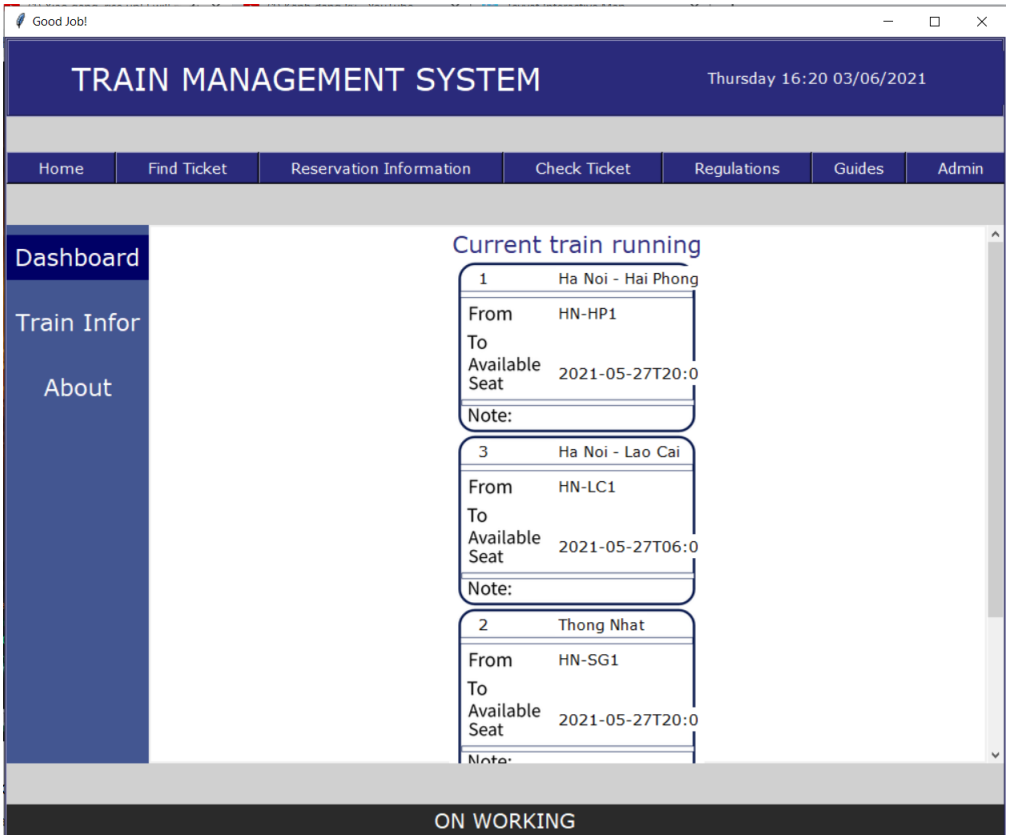


Figure 4: Dashboard

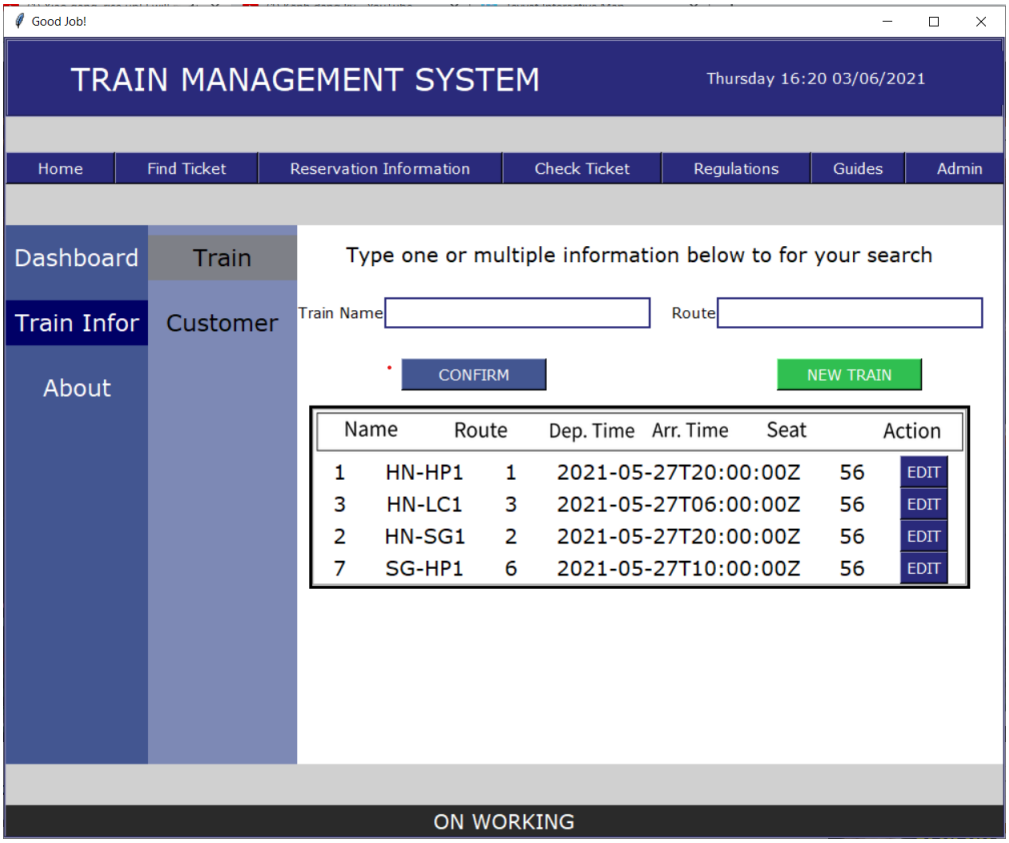


Figure 5: Train Information - Train Part

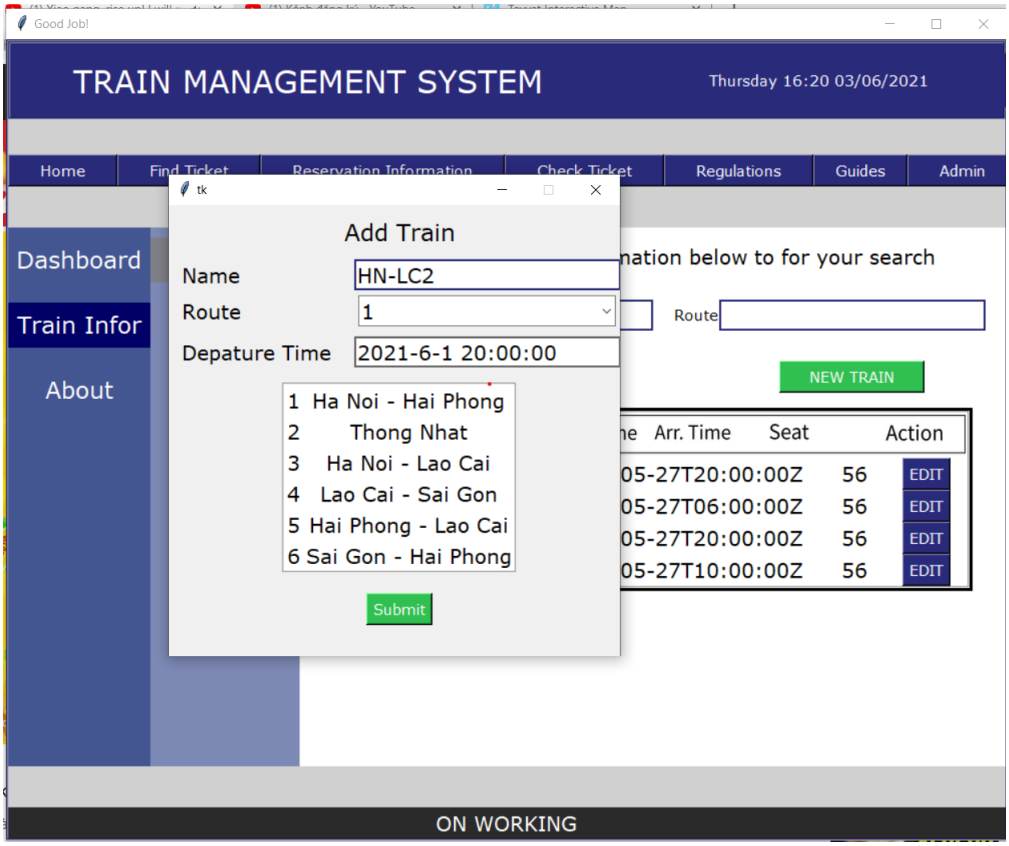


Figure 6: Create New Train

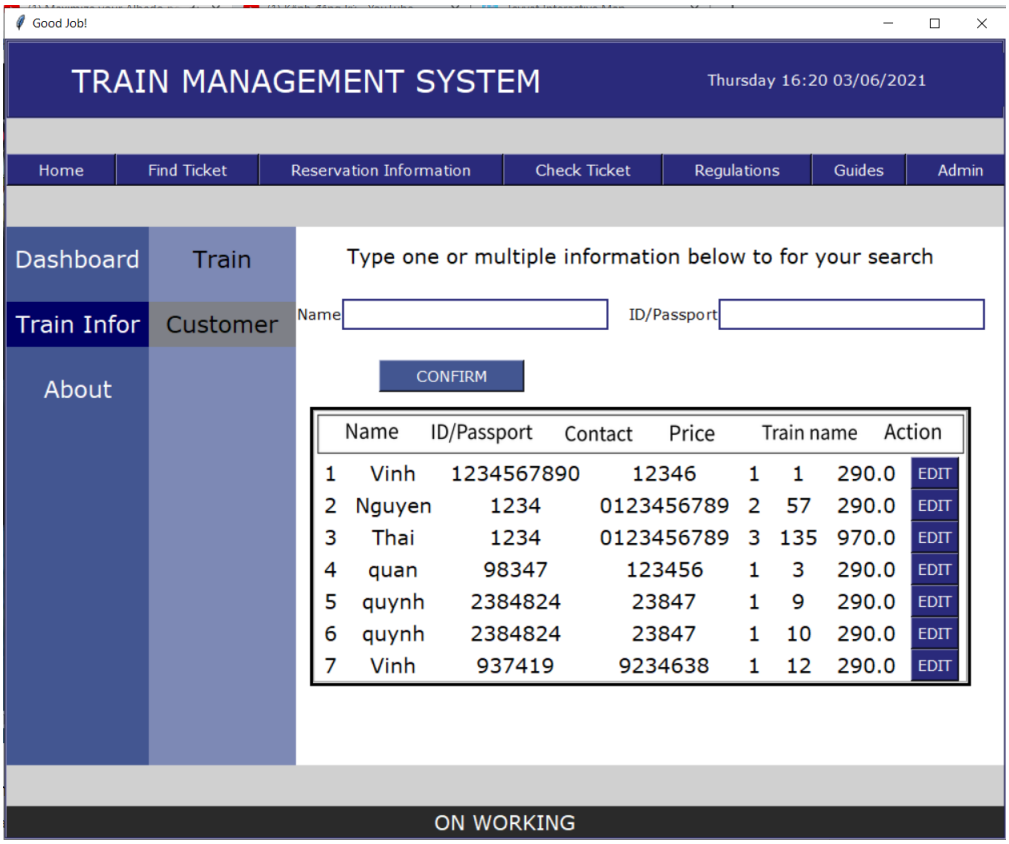


Figure 7: Train Information - Customer Part

### 2.4.2 Customers

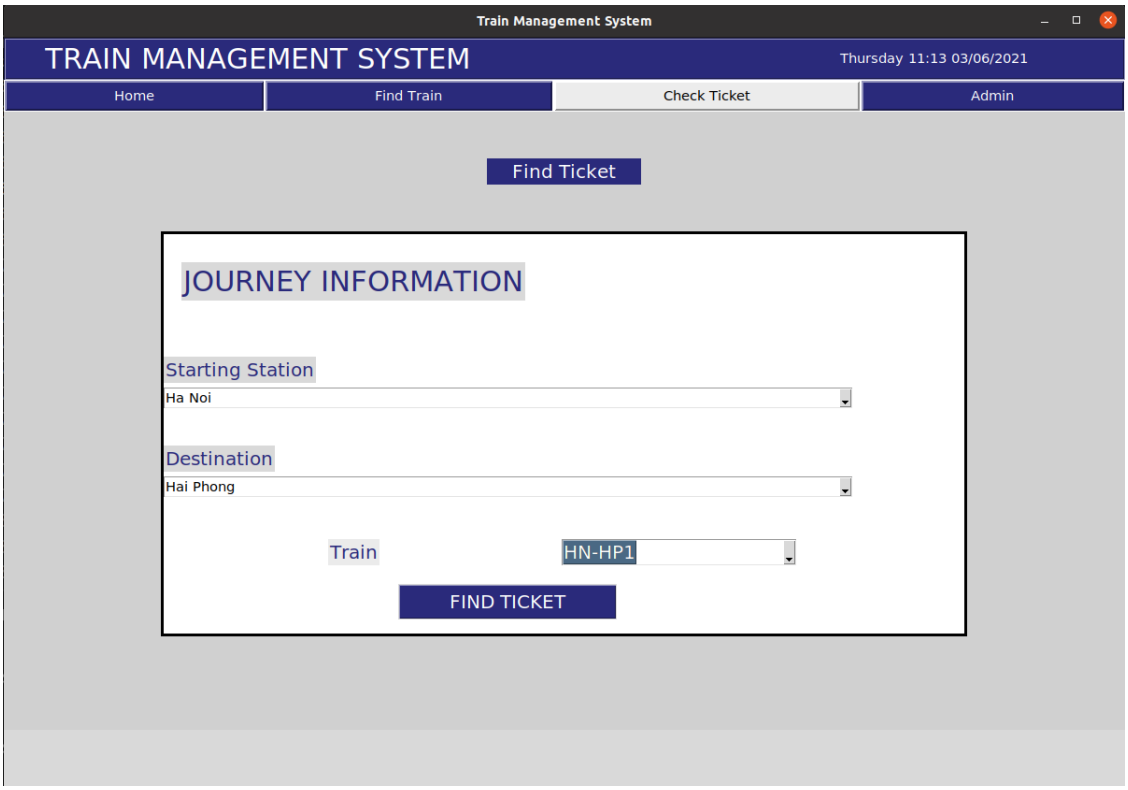


Figure 8: "Find Ticket" function for Customers

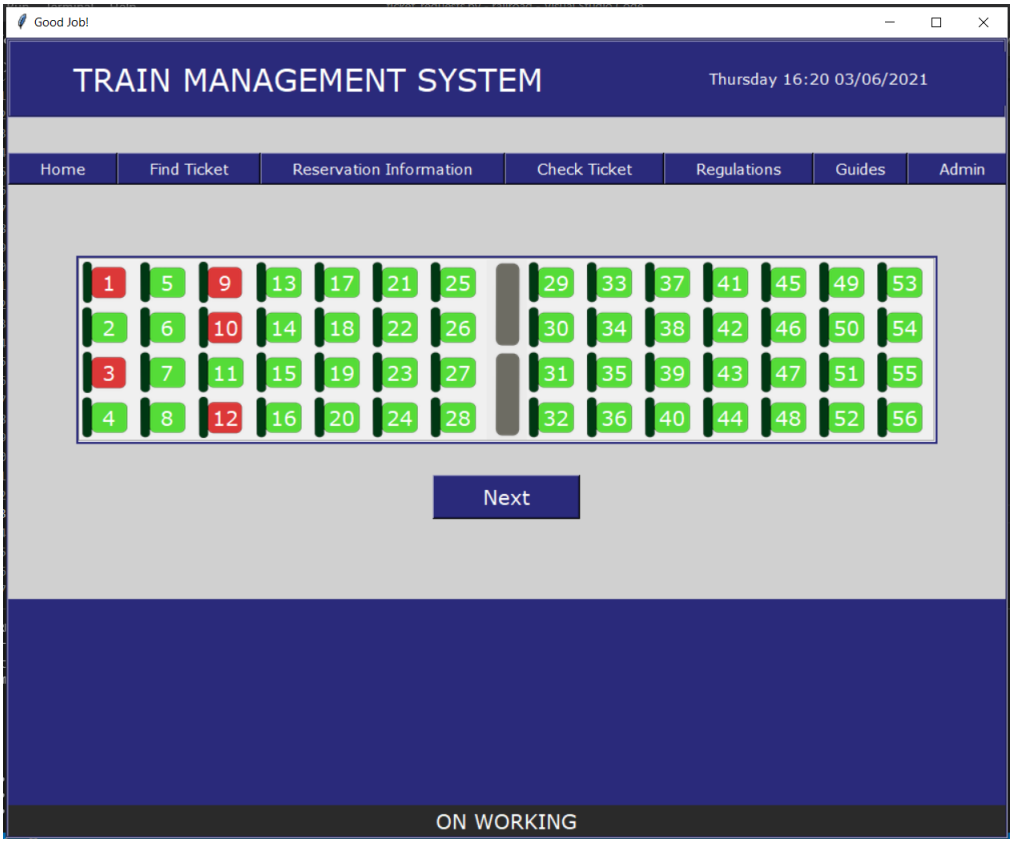


Figure 9: The screen for choosing seat

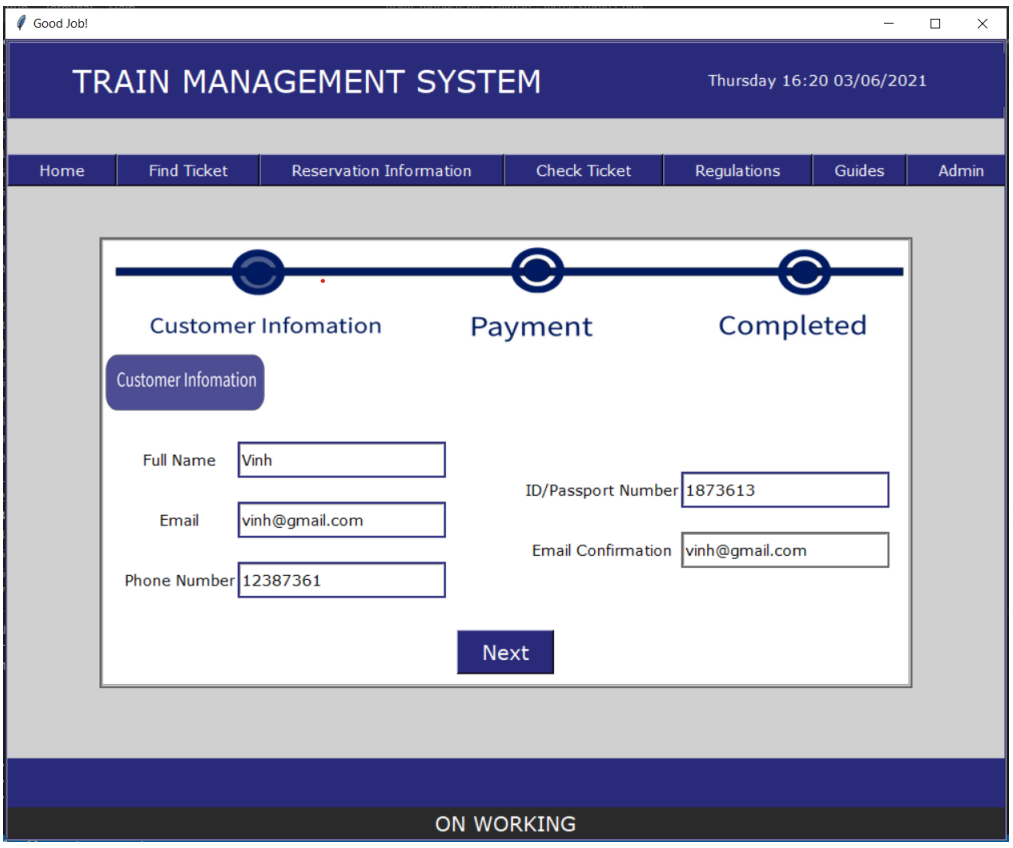


Figure 10: Filling Customer Information

# 3 Conclusion and Future Improvements

## 3.1 Conclusion

The report has shown details of the project Train Management System. At the moment, the application can manage well the data in administration, as well as serve clients in a proper way. The application runs smoothly with no bugs found yet; however, there are a lot of things that we can do in the future.

## 3.2 Future Improvements

There are many things that we can do more, such as better user interface, or faster application, etc. Some additional features can be developed in the future, such as giving back the ticket for the customer or having some staff-related function for administrators.