



University of Tehran General Department of Skill

Final Report on the Experiential Learning Course

Project Title: Parking Management System

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Vision of the University of Tehran General Department of Skill

University of Tehran General Department of Skill recognized as an effective and successful academic unit among universities nationwide, aims to establish optimal communication with industry and society. This initiative seeks to enhance the employability of university students and graduates, improve their skills and capabilities, and provide appropriate guidance for entering the labor market.

Mission of the University of Tehran General Department of Skill

University of Tehran General Department of Skill was established in accordance with the nation's comprehensive science and technology plan. It utilizes educated social and human capital, along with support from both domestic and international organizations, to enhance the knowledge and skills of university students, undergraduates, and graduates. The Directorate seeks to empower these individuals to enter the labor market and address societal needs while simultaneously fostering job and professional opportunities through a demand-oriented approach that facilitates employment

The main objectives of the University of Tehran's "General Department of Skill

- 1-Identification of talent among university students and graduates
- 2-Facilitating the empowerment of university students and graduates to adequately prepare them for entry into the labor market
- 3-Enhancement of both quantitative and qualitative aspects of employment-related events
- 3-Fostering partnerships with organizations and encouraging their engagement to deliver services that align with the actual demands of the labor market.
- 4-Delivering educational and advisory services to students in socioeconomically disadvantaged regions
- 5-Observing the employment outcomes of students and alumni from the University of Tehran
- 6-Facilitating the acquisition of cultural, social, and vocational skills for university students and graduates

Title: Parking Management System

Main Aims:

- 1.To manage and track vehicles entering and exiting a parking facility
- 2.To accommodate different types of users with varying privileges and pricing structures:
 - - VIP Users (20% discount on parking fees)
 - - Normal Users (standard rates)
 - - Daily Users (special rates for long-term parking)
3. To calculate parking fees based on the duration of stay
4. To maintain a database of parked vehicles and their owners

Key Features:

- User classification system
- Real-time entry and exit tracking
- Automated cost calculation
- Support for multiple pricing models
- Capacity management (default limit of 100 spaces)
- Detailed information display for each parking session

The project was developed using C++ and QML within the Qt framework, focusing on achieving cross-platform functionality. It leverages modern C++ features, such as multithreading, to build a robust and easily maintainable parking-management system.

The system is beneficial for the following:

- Commercial parking facilities
- Shopping centers
- Office buildings
- Any facility requiring organized parking management with different user categories

Overall Project Structure:

This is a parking management system implemented in C++ using the Qt Framework. The system manages different types of parking users (VIP, Normal, and Daily) with various features and pricing models.

Main Components:

1. User Class Hierarchy

- Base User class with basic user information
- VIPUser: Premium users with special privileges and discounts
- NormalUser: Regular registered users
- DailyUser: Temporary parking users

2. Parking Management Classes

- ParkingManagement: Main controller class
- ParkingVIP: Manages VIP parking spaces
- ParkingNormal: Handles regular parking
- ParkingDaily: Manages daily/temporary parking

Key Functionalities:

1. User Management

- - User Registration
- - Multiple car registration (for VIP users)
- - Entry/exit tracking- Cost calculation

2. Parking Operations

- - Space allocation
- - Entry/exit management
- - Duration tracking
- - Fee calculation

3. Reporting System

- - General reports
- - Current occupancy reports
- - User listings
- - Income tracking

4. File Operations

- - Reading/writing user data
- - Maintaining parking records
- - Transaction logging

Usage Flow:

1. System initialization with floor and space numbers
2. User selection (VIP/Normal/Daily)
3. Vehicle entry/exit processing
4. Payment handling
5. Report generation

Special Features:

1. VIP Users

- Can register multiple vehicles
- Get discounted rates
- Special privileges

2. Regular Users

- Standard parking rates
- Basic registration

3. Daily Users

- Hourly rates
- No registration required
- Temporary access

This system provides a comprehensive solution for managing different types of parking users using various pricing models and access controls.

Final Result:

We developed a program with a graphical interface using QML to improve the user experience. Additionally, all user information and parking capacity details were temporarily stored in an Excel file (.xls). xlsx). This arrangement ensures that when the next vehicle arrives at the parking lot, the driver is informed of the available space. Moreover, both VIP and Daily users can access their monthly charges.

For future phases of the project:

it is advisable to consider the development of a socket to facilitate the connection between two distinct computers, thereby enabling the exchange of information.

Thanks for your attention