

**NORTH SOUTH UNIVERSITY**

Project Report of

# Programming language I Lab (CSE115.20L)

**Submitted to**

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Toll System

1. **Introduction**

The Toll System is a console-based application built using C language that helps automate the process of collecting toll fees.

It is an easy-to-use interface where drivers can pay their tolls based on vehicle type and destination.

It also provides useful tools for managing toll operations. Such as:

* closing specific exits
* keeping track of collected income
* maintaining detailed records

1. **Background**

Traditional toll collection systems often rely on manual fee collection, which can lead to calculation errors, delays and inefficiencies. With the help of programming, a simple C-based application can be built to act and work as a substitute for this manual fee collection.

1. **Purpose and Benefits**

The primary purpose of the Toll Management System is to provide a reliable and automated toll collection process. Benefits of using the system:

* Eliminating manual calculation errors.
* Ensuring accurate toll payments through validation loops.
* Allowing administrators to control and monitor toll operations.
* Maintaining a persistent record of vehicles and income via file storage.
* Serving as a learning project for applying programming concepts to real-world scenarios.

1. **System Features**

**Some of the Features included in the system:**

* **Vehicle Toll Calculation:** Calculates toll using the formula.
* **Payment Validation:** Ensures users cannot proceed until full toll payment is completed.
* **Exit Management:** Admin can open or close exit points.
* **Admin Login:** ID and password protected with limited attempts.
* **History Tracking:** Saves vehicle counts and total income in a text file.
* **Exit Functionality:** Displays current date and time when the system is closed.

1. **Advantages**

Some of the noticeable advantages of using this toll system:

* Reduces human error in toll calculation.
* Improves efficiency by automating payment validation.
* Provides persistent storage of toll data for accountability.
* Allows administrators to manage toll operations flexibly.
* Demonstrates practical application of C programming fundamentals.

1. **Limitations**

* Console-based system only. No graphical interface available.
* Vehicle types and toll formula are fixed and not configurable.
* File storage is simple text-based.
* Limited to single-user operation at a time.
* Exit names and distances are predefined.

1. **Topics Covered**

* C **Programming Fundamentals** – loops, conditionals, arrays, and functions are used.
* Structures – for storing admin credentials.
* File **Handling** – saving toll history and income persistently.
* Menu**-Driven Programming** – multiple menus for users and admins.
* Validation **& Error Handling** – checking payments and login attempts.

1. **Future Work**

* Develop a **graphical interface** for better usability.
* Add support for **RFID-based vehicle detection** or license plate recognition.
* Replace text file storage with a **database system** for scalability.
* Add features such as **discounts, monthly passes, or VIP accounts**.
* Implement **multi-user/network support** for managing multiple toll plazas.
* Enhance security with **encrypted credential storage**.