# PAKISTANI PAHIYAH

## "JAHA MILAY SAB KUCH, JO HUM KO BHI NAHI MALOOM"

### Muhammad Sarmad Fowad (22i-2222), Zain Khalid (22I-2161)

> ℹ️ *Imagine a project sparked by the popular PakWheels platform. It's a C++ application designed to manage a comprehensive database of vehicles introduced in Pakistan since its independence in 1947.*
>
> *Think of it as a miniature version of PakWheels or a "Pakistani Pahiyah," but it's purely a Command-Line Interface (CLI) project with no graphical user interface involved.*
>
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## OVERVIEW

> ℹ️ *Our project will maintain a comprehensive database of all cars in Pakistan since 1947, covering every model from past to present, including rare and lesser-known vehicles.*

Our project's tagline, "jaha milay sab kuch, Jo hum ko bhi nahi maloom," truly captures its essence. This means it will encompass all vehicle data, from those still in production to those that ceased long before we were born. It's not just about the current or well-known cars in Pakistan but also those rare and forgotten models that even enthusiasts might not know existed here. Whether it's a classic gem that stopped production decades ago or a recent model, our database aims to cover it all.

### The Objective

> ℹ️ *Our project will provide exhaustive information about cars, from top to bottom, start to end, every inch, and even every single bolt, tailored to user requirements.*

- On a single input, the system will provide all the data about the car the user wants to find.
- It can sort data and provide output as required, based on make, model, name, class, rim size, engine, etc…
- It can perform operations like adding, editing, deleting cars, managing users, and handling client and admin operations, etc.
- Also tell the availability of the car in specific region is it present there or not, either for sale or for exhibition for the vintages car, and many more etc…
- As the project progresses, new features and functions will be added based on development and emerging ideas.

## The Opportunity

> ℹ️ *This project is a fantastic real-time opportunity for us developers. Not only can we turn it into a lucrative venture by advancing and implementing it as a website, Also it will also aid in our final exam preparation.*

    i. Offers a real-time development opportunity.

    ii. Can be turned into a profitable website venture.

    iii. Assists in preparation for final exams.

    iv. Provides practical, hands-on experience.

    v. Reinforces theoretical knowledge through application.

    vi. Useful for understanding exam-related concepts.

# OUR PROPOSAL

> ℹ️ *We will use Advance or Basic Data structure concept in order to implement PAKISTANI PAHIYAH.*

We will ***might*** use following Algorithms and Techniques in our project. These will might be used but might differ at the time of making the project.

    i. Pointers:
        a. Variables that store memory addresses of other variables.

    ii. Structures
        a. User-defined data type that groups related data items of different types.

    iii. Classes(Encapsulation, Abstraction, Inheritance, Polymorphism, Constructor, Destructor, Public, Private, Protected)

    iv. Trees (For Store, Manage Vehicles Data, Add, Search, Display, etc…):
        a. Trees represent hierarchical data such as file systems and organizational charts.
        b. Binary Search Trees (BSTs) provide O(logn) time complexity for search, insert, and delete operations.
        c. Trees can grow and shrink dynamically, adapting to changing data sizes.
        d. AVL and Red-Black trees maintain balance to ensure logarithmic height and efficient operations.
        e. B-trees and B+ trees are used in databases for efficient data management and minimal disk I/O.
        f. Trees support graph traversal algorithms like DFS and BFS for solving various problems.
        g. Splay trees manage memory allocation efficiently by keeping track of free and allocated blocks.
        h. Spanning trees in networking protocols prevent loops and ensure efficient data routing.

    v. Stack (Login system, etc…):
        a. **push()**: Adds an element to the top of the stack.
        b. **pop()**: Removes the top element from the stack.
        c. **top()**: Returns the top element of the stack without removing it.
        d. **empty()**: Checks if the stack is empty.
        e. **size()**: Returns the number of elements in the stack.
        f. **swap()**: Exchanges the contents of the stack with another stack

**Muhammad Sarmad Fowad(22i-2222)**
**Zain khalid(22i-2161)**

  vi.  Queue (Manage and process vehicle-related tasks, etc…):
- a. **enqueue()**: Adds an element to the end of the queue.
- b. **dequeue()**: Removes the front element from the queue.
- c. **front()**: Returns the front element without removing it.
- d. **rear()**: Returns the last element in the queue.
- e. **size()**: Returns the number of elements in the queue.
- f. **empty()**: Checks if the queue is empty.
- g. **full()**: Checks if the queue is full (for bounded queues).
- h. **peek()**: Returns the front element without removing it (similar to front()).
- i. **is_empty()**: Checks if the queue is empty (similar to empty()).

  vii.  Graphs, Maps:
- a. Analyze relationships between vehicles.
- b. Find shortest paths and display connections.
- c. Etc…..

  viii.  Also might use any other type of data structure to implement the specific task.

## Rationale

> ℹ️ *We chose this project because it allows us to apply all the coding techniques we've learned and gain valuable insights into the automotive industry.*

**Research-Focused Adventure:** Our mission is to gather comprehensive data about cars, leaving no stone unturned.

**Exploring Market Potential:** We'll identify and analyze real-time economic trends in the automotive industry to discover promising market opportunities.

**Aligning with DSA Excellence:** Our goal is to achieve excellence in Data Science and Analytics by aligning our findings with this mission.

## Execution Strategy

Our execution strategy incorporates proven methodologies, extremely qualified personnel, and a highly responsive approach to managing deliverables. Following is a description of our project methods, including how the project will be developed, a proposed timeline of events, and reasons for why we suggest developing the project as described.

  i.  We will gather date some have been gathered*( Serial Number | Make | Model | Launch Year | Launch Price | Discontinue Year | Discontinue Price | Number Sold | Engine Size | Class | Rim Size | Fuel Type | Drivetrain | Transmission Type | Horsepower | Torque | Body Style | Number of Doors | Color Options | Top Speed | Acceleration (0-60 mph) | Fuel Efficiency (City/Highway) | $CO_2$ Emissions | Safety Rating |*

**Muhammad Sarmad Fowad(22i-2222)**
**Zain khalid(22i-2161)**

*Warranty Period | Technology Features | Interior Materials | Cargo Capacity)*

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- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
- | ---
| Suzuki | Mehran | 1989 | PKR 90,000 | 2019 | PKR 700,000 | 500,000 | 0.8L | Hatchback | 12" | Gasoline | FWD | Manual | 40 hp | 59 Nm | Hatchback | 4 |
ite, Silver, Red | 130 km/h | 23 seconds | 13/17 km/L | 120 g/km | 1 star | 1 year/20,000 km | Basic Radio, Air Conditioning | Cloth | 100 L
| Honda | Civic | 1995 | PKR 600,000 | Still in production | - | 200,000 | 1.5L | Sedan | 15" | Gasoline | FWD | Automatic | 130 hp | 114 lb-ft | Sedan |
| White, Black, Gray | 180 km/h | 10 seconds | 12/15 km/L | 160 g/km | 3 stars | 3 years/100,000 km | Navigation, Cruise Control | Leather | 400 L
| Toyota | Corolla | 2000 | PKR 800,000 | Still in production | - | 300,000 | 1.6L | Sedan | 16" | Gasoline | FWD | Automatic | 120 hp | 154 Nm | Sedan |
| Silver, Black, Blue | 200 km/h | 12 seconds | 11/14 km/L | 140 g/km | 4 stars | 3 years/100,000 km | Advanced Infotainment, ABS | Fabric | 450 L
| Suzuki | Alto | 2005 | PKR 500,000 | Still in production | - | 250,000 | 1.0L | Hatchback | 13" | Gasoline | FWD | Manual | 67 hp | 90 Nm | Hatchback |
| White, Red, Green | 140 km/h | 15 seconds | 14/18 km/L | 110 g/km | 2 stars | 2 years/50,000 km | Basic Radio, Power Windows | Cloth | 150 L
| KIA | Sportage | 2019 | PKR 4,500,000 | Still in production | - | 50,000 | 2.0L | SUV | 17" | Gasoline | AWD | Automatic | 155 hp | 192 Nm | SUV | 4 |
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ii.      Read file data and storing it.
iii.     Make the login system.
iv.     Divide the functions for different logins.
v.      Implanting those function.
vi.     Making header files if needed.
vii.    Finding corner cases.
viii.   Implement code on hard scenarios and cases.
ix.     Do robust run of the code.

## Technical/Project Approach

> ℹ️   *Pakistani Pahiyah: From classics to clunkers, we've got a database full of surprises!*

## Resources

> ℹ️   *Multiple resource will be the part like our previous assignments and Worldwide many more other source will be the part of this project.*

All the code available on the slides, online source and many other legal sources will be the part of this project in order to compile the whole, code.

# EXPECTED RESULTS

> ℹ️   *Every car in Pakistan has a story, and we're here to tell it all, bolts and all!*

Following result ***might*** be the outcome of executing the code.(This will might differ as project moves on)

## Admin

- Add, Delete, Edit any specific item or specification.
- Make any new advancement related to the other users.
- Also can implement all functions of simple user.

## User

- Sort Date on base of any specification.
- Find specific data related car.
- Find car based on model number, chassis number, year, price, capacity and many much more.
- Also implement many other more functions, Etc….

  We follow our tagline "JAHA MILAY SAB KUCH, JO HUM KO BHI NAHI MALOOM".

## Other Benefits

> ℹ️ *Pakistani Pahiyah: If it has wheels and a history, it's in our Console!*

Enhancing this can help us in our upcoming courses and Projects.

# CONCLUSION

> ℹ️ *Pakistani Pahiyah: Because even our grandpa's first car deserves a spot in the spotlight!*

The "Pakistani Pahiyah" project is a comprehensive C++ application managing a detailed vehicle database in Pakistan since 1947. Embracing the tagline "jaha milay sab kuch, jo hum ko bhi nahi maloom," this CLI tool provides exhaustive information on all car models, including rare ones. Using advanced data structures and algorithms. Serving as a valuable resource for enthusiasts and researchers, the project offers practical development experience and holds potential for future expansion and commercialization.

Thank you for your consideration,

Name: Muhammad Sarmad Fowad(22i-2222)
Title:   Pakistani Pahiyah