

INF 551 Project - Final Report

By -

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Used Car Inventory System:

The project deals with building a used car inventory system. The system allows the users to browse through a list of used cars based on various car attributes and select the car of their choice for purchase. The system was implemented as a web application.

Project Motivation and Goal:

The motivation of the project came from the fact that a lot of people buy used cars in the United States but there are only a few number of websites which contain a complete used car inventory where the users can browse through a list of used cars and select a car based on their preferences. Our project aims to fill this void and present a complete, user-friendly used car inventory system.

Architecture of the application:

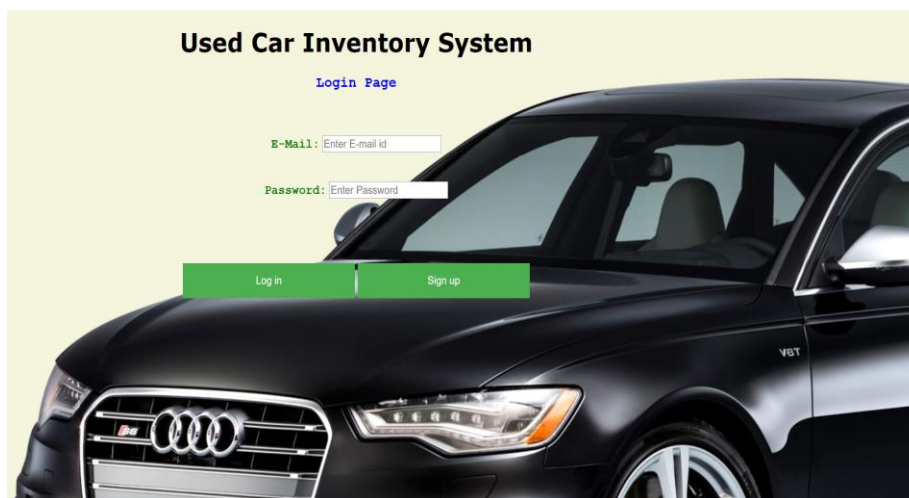
- Key Components:

1. User Interface
2. Search Interface & Engine
3. Cloud Database

The user interface consists of four webpages, namely user login/signup page, main search page, advanced search page and saved search page.

Screenshots of the webpages -

User Login / Signup Page:



Main Search Page:

Used Car Inventory System
Search Page

Search Term:

Specific Search

* All Search Keys ☐ Make ☐ Year ☐ Vehicle Style ☐ Vehicle Size

Search Results

id	Make	Model	Year	Price	Market Category	Vehicle Style	Vehicle Size	Transmission Type	Wheel Type	Doors	City Mileage
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[Saved Search Terms](#)

[Advanced Search](#)

Advanced Search Page:

Used Car Inventory System
Advanced Search Page

Faceted Search

Search Term:

[Saved Search Terms](#)

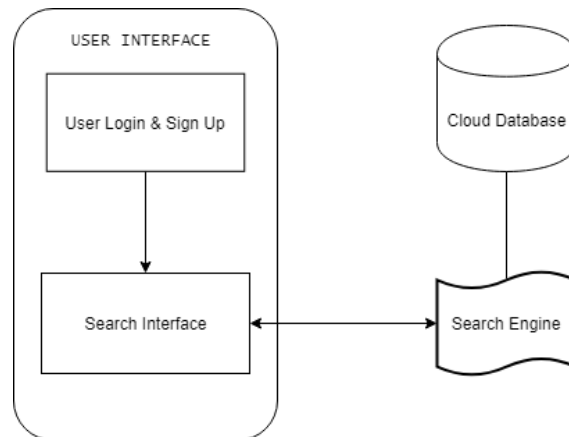
Saved Search Page:

Used Car Inventory System
Saved Search Page

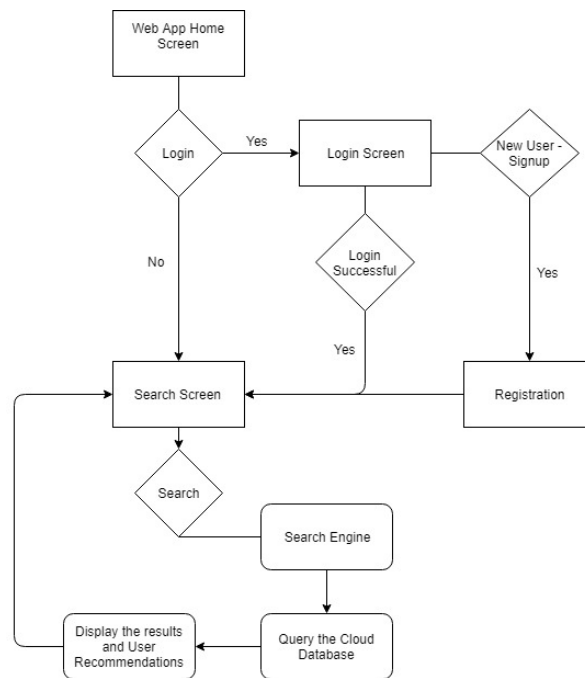
List of saved search terms for: abc@usc.edu

Search Term
bmw

- Architecture Diagram:



- Design Flow Diagram:



Languages used – HTML, CSS, JavaScript, Python

Dataset:

The dataset used in building the system was obtained from Kaggle. It contains over 10,000 cars with various car attributes like Make, Model, Price, Year, and Mileage. Firebase Realtime Database is the cloud database used in the project. The data was present in Comma Separated Value (CSV) format and we converted it into JSON format for storing it in Firebase. The data is loaded in Firebase using a Python script. Inverted Indexes were created in the database for various important fields. Firebase JavaScript client SDK is added and configured into our application.

Screenshot of the dataset:

Make	Model	Year	Engine Fuel Type	Engine HP	Engine Cylinders	Transmission Type	Driven_Wheels	Number of Doors	Market Category	Vehicle Size	Vehicle Style	highway MPG	city mpg	Popularity	MSRP
BMW	1 Series M	2011	premium unleaded (required)	335	6	MANUAL	rear wheel drive	2	Factory Tuner,Luxury,High-Performance	Compact	Coupe	26	19	3916	46135
BMW	1 Series	2011	premium unleaded (required)	300	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Convertible	28	19	3916	40650
BMW	1 Series	2011	premium unleaded (required)	300	6	MANUAL	rear wheel drive	2	Luxury,High-Performance	Compact	Coupe	28	20	3916	36350

Implementation:

1. **Signup/Login:** When a new user signs up, a new record is created in Firebase under “users.json” which contains his e-mail id and password. For login, the input values entered by the user is checked with all the records present in “users.json” and if a match is found, the user is logged in. If a match is not found, the appropriate error message is thrown.
2. **Main Search Page:** The page contains a keyword search box. When the user enters keywords, the search engine takes them and queries the database. The output of the query is obtained from the database and displayed to the user. The search is performed by tokenizing the keywords and querying the indexed attributes in the database for each keyword. The users can save their previous searches. They also have the option of performing a specific search using few important car attributes. In specific search, the database will be queried only on the particular attribute the user selects.
3. **Advanced search page:** This page is for performing advanced faceted search. There are 3 facets on the attributes Vehicle Size, Year, Number of doors. The user can filter the search results after initial search by using the respective facets. Array data structure in JavaScript is used to keep track of the selected facets.
4. **Saved search page:** The users can view and delete their saved search history in this page. Each saved search is stored in the database as User ID and Search Term pairs. These pairs are retrieved for each user by comparing the User ID.

Challenges encountered:

The following challenges were encountered in the project:

- Formulating the dataset to be used in the system.
- Implementing the web application.
- Formulating the search facets and implementing them.

Advantages of Firebase:

- Firebase stores data in JSON format which is very flexible.
- It is a real time database.
- It is secure and easy to access.

Disadvantages of Firebase:

- It is not an SQL database.
- Querying and indexing functionalities are limited.

Responsibilities:

1. Application Interface - Balasubramanian Thiagarajan
2. Database Integration - Abhishek Bhatt
3. Search Engine - Abhishek Bhatt and Balasubramanian Thiagarajan