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ARCGIS BASED SPATIAL REFERENCE FOR REMODELING OF THE ROUTE NAVIGATION IN RENTED VEHICLE

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Abstract: In recent years, the price of crude oil has risen fast, and as the price of crude oil rises, so do the cost of fuel and cars. To solve this problem, the carpooling concept is introduced, in which we share a car or a vehicle that is heading to the same destination from the same source. . When the notion of automobile polling comes into play, there are numerous approaches that come into play. Some of these ways are inefficient, while others are not scalable enough to handle a large number of users. In this study, we do car polling utilizing machine learning and the ArcGIS map navigation system, where we find the most optimal route for efficient vehicle polling and analyze how much income and gasoline we save by doing so.

IndexTerms **– Car Pooling, K-Means clustering, Euclidian distance, Arcgis**

I. INTRODUCTION

In the Recent times there are Different vehicle sharing and driving systems have been suggested and developed throughout the years, but only a handful, at least until recently, have been widely used. Most of them were not intended to be scalable originally, leaving customers with sub-user experiences as the base of their users expanded and sometimes the mobile or desktop customer access was inadequate, making them inaccessible to all the mobile customer devices and/or desktop browsers. This project covers the concepts of design, distribution and resource planning, as well as ways for viewing the map using the Arcgis map navigation library. The authors think that any future global carpooling and ride-sharing system might follow, making it highly scalable and all-round enough to effectively reach and serve a global user base. Customers may book and share rides easily. Ride-booking apps utilize GPS to find the closest available vehicle on a smartphone, thus saving users money on petrol. The user gets an estimated pickup time, vehicle description and driver picture using this online carpooling system. At the destination, the user may pay. The Main Purpose of this Project is to perform the Car pooling by using the Arcgis Based spatial reference for remodeling of route navigation in rented vehicle, where It seeks to decrease the costs of travel to daily passengers, which not only saves money but also lowers our dependence on the most important non-renewable resource we have, gasoline, which at an alarming pace is diminishing.

II. LITERATURE SURVEY

A large data approach to carpooling was suggested by Qian Shi and Xu Chen et al (2020). Massive data sets. Big data is the fuel for broad AI applications. This paper proposes a novel cooperative data buying architecture that leverages the strength of the data user population and inherently trustworthy collaborative connections. We develop a comprehensive approach that involves both the formation and selection of data purchasing groups. On top of their underlying cooperation links and the data market platform's maximum allowed group size for data sharing, individuals interested in various data buy groups are divided for budget car pooling purposes. We propose a minimum cut approach for selecting the right number of data buy groups to fully fulfill their demands under budget constraints. We examine the performance of the cooperative data buying framework using ErdosRenyi and scale-free cooperation graphs. The numbers show that the proposed structure may achieve superior performance, with gains of over 40% in total revenue and 100% in satisfied customers over the non-collaborative scenario. [1]

Mohammad Tamannaei and Iman Irandoost (2018) developed a mathematical model for vehicle pooling using a heuristic beam search algorithm. Here, we shall explain how carpooling is an eco-friendly mode of travel. It has the ability to substantially help resolve urban societal problems including transportation congestion and pollution. This article proposes a new mathematical approach to the carpooling issue. At the same time, the model reduces travel time, vehicle utilization, and vehicle delays. A precise solution method based on the Branch-and-Bound (B&B) algorithm is proposed. We present a heuristic beam search technique

based on a partial relaxation of certain fathoming criteria utilised in our suggested B&B. Computational research of Isfahan's transport network. The results show that the proposed suitable estimate technique outperforms the CPLEX software package in terms of computational solution time and number of evaluated nodes. This study's results may be utilized to create practical solutions to the carpooling issue [2]

Xiao Qiang and Yao Shuang-Shuang (2018) proposed a methodology for urban taxi carpooling vehicle based on the data field energy by using clustering algorithm. This work used a clustering method to accomplish carpooling. The problem of taxi carpooling on urban highways is solved by a clustering method based on data field energy and point spacing. The field energy of each data point in the point dataset is calculated using the data field energy function. With this method, the taxis are clustered according to the threshold value established by the product of each data point's feld values and point spacing. The compactness, separation, and Dunn validity indexes are used to compare the two algorithms. The suggested methods outperform the traditional clustering approach. The technique produces good clustering results for the taxi trajectory dataset in clusters 25, 249, 409, and 599. This algorithm may be used to cluster automobiles on city streets, providing new concepts and approaches for clustering vehicles on city streets [3]

Pengpeng Chen, Hongjin Lv, Shouwan Gao et.al had proposed the has a methodology on the car polling by using big data of real time taxi Recommendation System . Carpooling is becoming a more important traffic alternative since it may increase service options, reduce traffic congestion, and reduce overall car emissions. Although several recommendation algorithms recently suggested taxicab carpooling services, they do not completely comprehend the concept. This paper offers a unique recommendation system named VOT that gives a passenger with either an empty or occupied taxicab. It directs people to the nearest empty taxi. Otherwise, VOT uses algorithms to compare and cluster occupied taxicabs to suggest a nearby location to passengers. We enhance huge data processing efficiency by using Spark, a fast large data processing framework. This research examines VOT using GPS data from 14747 taxicabs. The results suggest that a range of less than 900 M may achieve 90.29 percent. Transportation of all passengers is considerably decreased (47.84 percent on average). Non-rush hour decreased overall mileage beats comparable systems by 35%. VOT and others have comparable detour ratios, even enhanced during hurry hours [4]

III. PROPOSED MODEL

The primary objective of this project is to create a utility that enables consumers to manage a simple and rapid mode of transportation. The consumer receives an approximate pickup time and a description of the approaching vehicle using this online carpooling system. The proposed system also provides the revenue usage graph of the each car vendor and it provides the map view navigation by Arcgis map library. In figure 1 specifies the Simple Architecture of Proposed System. Using the ArcGIS platform, we have developed a web application to perform car pooling. We have gathered data from two car vendors, Ola and Uber, then preprocessed the data in that we are preprocessed the data based on the location and next we Performed the Region classification based on the Mysore, Mandya , Ramanagara, Bangalore cites and next performed a clustering operation by employing the k means clustering algorithm. Finally, we performed car pooling operations by utilizing the Euclidian distance between the source and destination, we also view the revenue graph that is the revenue is generated by the each vendor

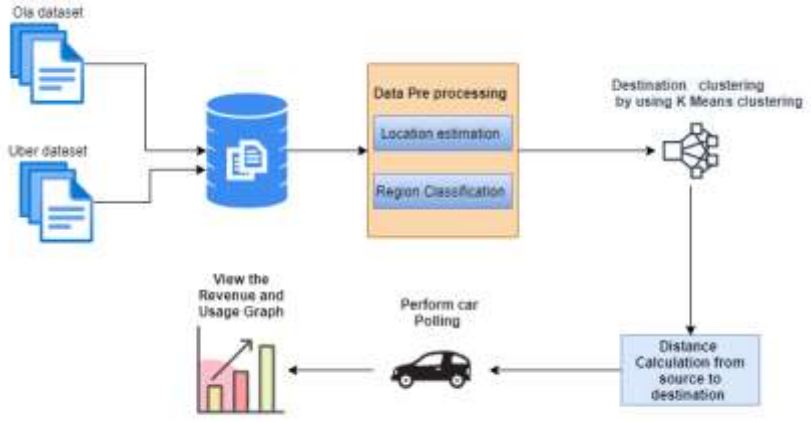

Figure 1 simple Architecture of Proposed System

RESEARCH METHODOLOGY

Dataset: In this proposed system we had used the ola and the uber dataset for the arcgis Based Spatial reference for the remodeling of route navigation in rented vehicle. Where it consist of the around 70 thousand dataset of the different regions like Mysore, Mandya , Ramanagara, Bangalore cities where in the dataset the Uber consist of the 23,568 and ola consist of 15,358 rows of dataset for performing the car Polling using Arcgis.

Data preprocessing: In the data preprocessing Includes the data location estimation where the dataset is divided based on the user location where the location will be fetch by the exact location of the system based on the GPS Location of the system after the location estimation we are performing the region Classification where data will be classified based on the region that is entered by the user to perform the car pooling.

Algorithm used

K-means clustering: The K-means is an iterative algorithm which divides the data packet into several non-overlapping sub-groups (clusters). It tries to retain data points in clusters as similarly as possible while keeping as varied (remote) clusters as possible. It clusters data points such that its squared distances are not as much in the centre of the cluster as feasible (arithmetic mean of all the data points in that cluster). The lower the variation across clusters, the more uniform the data points inside the cluster

Pseudo code of k means

PSUEDOCODE OF K MEANS

1. Species the Number K of Cluster to assign
2. Randomly initialize k centroids
3. **Repeat**
   Expectation: Assign each point to its closest centroid .
   Maximization: compute the new centroid (mean) of each cluster
4. **Until** the centroid position don't change

The steps to perform the K Means are

- In Step one First we have to Specify how many number of desired number of clusters that is K. let us consider K is the how many number of clusters that we have to perform the clustering.
- Next we have to assign the data points randomly.
- Next we have to Calculate cluster centroids from the data points Next we have to Recalculate cluster
- Next we have to Repeart steps 4 and 5 until no more progress is possible: Similarly, we will continue the fourth and fifth steps till global optimum is reached. When no more for two consecutive repetitions, data points will be switched between two clusters. If not expressly stated, it will signal the end of the algorithm.

Euclidean distance: As its name implies, the Euclidean distance formula provides the distance between two locations (or) the straight line distance. Let us take it for granted (x1,y1)(x1,y1) and (x2,y2) are two points in a two-dimensional plane. Here is the Euclidean distance formula.

The formula for Euclidean distance says:

$d = \sqrt{[(x22 – x11)^2 + (y22 – y11)^2]}$

Where,

- (x11, y11) are the coordinates of one point.
- (x22, y22) are the coordinates of the other point.
- d is the distance between (x11, y11) and (x22, y22).

IV. RESULTS AND DISCUSSION

In Our Proposed Work we are Performed the arcgis based car pooling where we performed the car pooling to the user to the specific destination where it gives the recommend the car pooling after that we can join that pooling which shows the pickup latitude, pick up longitude how much kilometer the specific user is traveled and the how much money he has to pay at last we can view the map where the user is performed the car pooling that shows in the figure 2 and it also predicts the how many rides can be made up to next 5 years that shows in the figure 2 and Figure 3 respectively

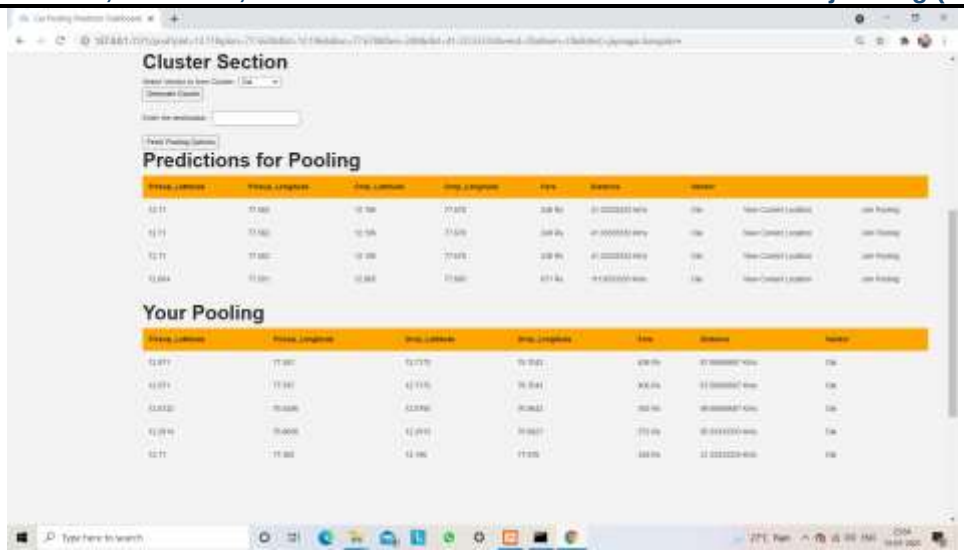

Figure 2 shows the performing of the car pooling

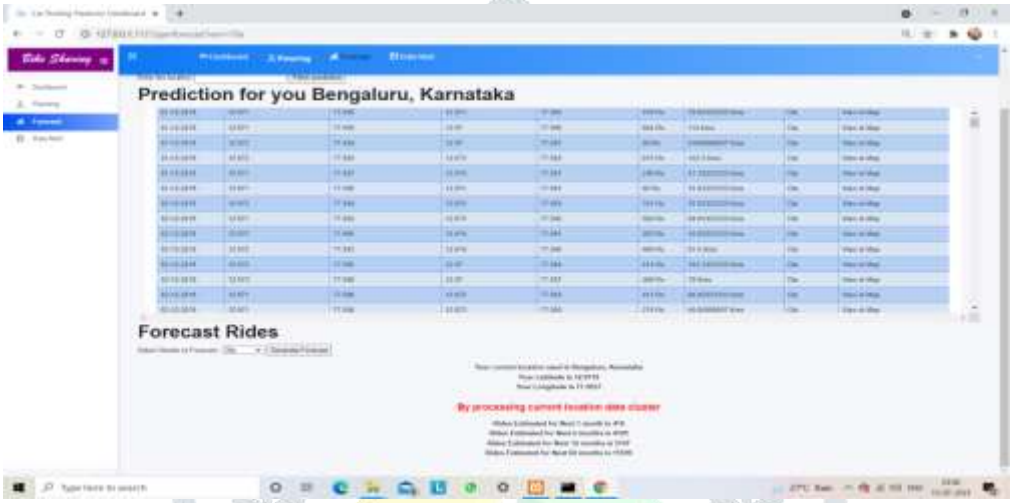

Figure 3 Shows the Ride Forecast up to next 5 Years

V. CONCLUSION

We had performed a methodology for car pooling By utilising Arcgis, we had suggested vehicle pooling It is a very effective technique of decreasing pollution and car congestion in cities. It is also an ecologically sound method of travel. It also gives them the chance to meet new people. As a consequence of public transit delays and private car delights, nowadays most individuals prefer to go by private vehicle. Pre-registration ensures that only recognised persons access the vehicle and therefore trusts. And we calculate the number of car polling predictions for the next five years, and also the location of car collection by using Arcgis map navigation. Registered passengers are assigned specific days during which they should drive their own car, so that they do not experience any difficulties during their regular journey.

VI. ACKNOWLEDGMENT

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