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Different Clustering Pattern Algorithms using Tropical Storm Data

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***Abstract*-The main aim of this research will apply spatial temporal clustering concept in real time data set. The cluster techniques apply for hurricanes /Tropical Data in Northern Indian Ocean. The tropical data collection starts from year 2001 to 2013. In cluster analysis the group membership is unknown prior to the analysis. The clustering is applied not for all the data but only consider maximum wind of every year and minimum wind of every year. The first section cluster constrains set as maximum wind range occurs for each year. The second section describes minimum wind range from each year. The database keeps all records of data. The equations are used to give knowledge about how to cluster data retrieve from the database. The algorithms are using both clustering pattern, to cluster final data from this database. The comparison diagrams and pie chart explain briefly about cluster output result. The wind clustering percentage will be calculating different range basis. The SQL query to retrieve in the prescribed range format.**

***Keywords*— Hurricane Dataset-Clustering -Comparison-Algorithms-Range Values.**

I. INTRODUCTION

Data mining uses large quantities of data to create models. These models can provide insights that are revealing, significant, and valuable. Clustering is used to finding natural groupings in the data that are often used for identifying different ways. The field of spatial databases has been an active area of research. There are two common models of spatial information: field-based and object-based. The spatial types and operations have been made to be a part of a query language such as SQL. Databases that store information about states of the real world across time are called temporal databases. Moving objects are the object of which spatial data is changed in sequence over time. The positions of moving objects are continuously changing over time. For modelling these moving objects, consider both continuous and discrete models. Basis on above knowledge cluster data to tropical storm datasets.

II. RELATED WORK

A. *Maximum Wind Cluster*

The section deals with clustering maximum wind details are Hurricane/Tropical Data for Northern Indian Ocean from the website of http://weather.unisys.com/hurricane/. Here to cluster the flow record of maximum wind, start from the year of 2001 to 2013.

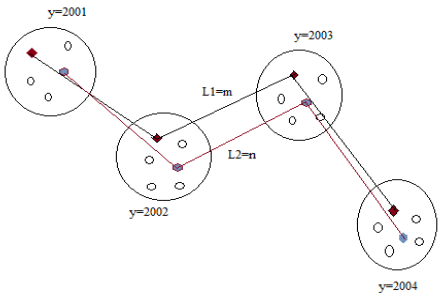
Equation:

$$\mathbf{MW_{clus}} = \mathbf{MW_{Data}} \qquad \text{--eq(1)}$$

Where MW represent maximum wind cluster; MW represent maximum wind data collection

$$\mathbf{MW_{count}} = \sum_{y=1}^{y=n} \mathbf{MW}_{max} \qquad \text{--eq(2)}$$

Where MW_{count}- represent sum of cluster maximum report values; y represent 2001 to 2013 year wind details.



L1=m denote only maximum wind;
L2=n denote only minimum wind

Fig.1 the Selection of data from Clustering Based on Wind

The figure 1 shows describes selection of data from clustering based on wind, the sample diagram of clustering, the year(y) denote 2001,2002,2003,2004 cyclone affected details, the line L1 denote only to cluster maximum wind of each year. The line L2 denotes only cluster minimum wind of each year.

B. *Minimum Wind Cluster*

This section deals with cluster the minimum wind details are Hurricane/Tropical Data for Northern Indian Ocean

from the website of http://weather.unisys.com/hurricane/. Here to apply clustering the flow record of minimum wind, start from the year of 2001 to 2013.

$$\mathbf{MW_{count}} = \sum_{y=1}^{y=n} \mathbf{W_{min}} \qquad \text{--eq(3)}$$

Where MW_{count}- represent sum of cluster minimum report values

III. DATA ANALYSIS

The table (1) shows cyclone1 hurricane flow data analyzation, Specifies the following fields, the maximum wind id set as unique identity, name specifies wind name, DStart specifies starting date of wind occurrence, Edate specifies ending date of wind occurrence, wind pressure details, wind category range and year of occurrence.

TABLE I
CYCLONE1 DATABASE TABLE

Sl.No	Attribute	Description
1	ID	Set with unique attribute
2	CName	Wind Name Occurrence
3	DStart	Wind occurrence Starting Date
4	Edate	Wind occurrence Ending Date
5	Wind	Wind Details
6	Cat	Wind Category Range
7	Year	Year of Occurrence

IV. RESEARCH FINDING

A. Cluster Algorithms

The algorithm-1 describes step1 create data base table, step2 stored all the information to the specified database table, step3 conform the stored data, step4 set constrain and the select Max (win) using group by clause.

Algorithm-1

Step1: Create database table
Step2: Stored relevant database details
Step3: Collect all the information and equation (1)
Step4: Cluster Max wind details from the year 2001 to 2013 based on equation (2)
Select Max (wind) from cyclon1 group by year
Step5: Stop

Algorithm-2

Step1: Create database table
Step2: Stored relevant database details
Step3: collect all the information and equation (1)
Step4: Cluster Min wind details from the year 2001 to 2013 based on equation (3)
Select Min (wind) from cyclon1 group by
Step5: Stop

The algorithm-2 describes step1 create data base table, step2 stored all the information to the specified database table, step3 conform the stored data, step4 set constrain and the select Min (win) using group by clause.

V. EXPERIMENTAL RESULT

The Table II show the details of MAX(wind) cluster from cyclone data 2001 to 2013.The year 2001 Maximum Wind 65,2002 the maximum wind 135,2003 maximum wind 65 and so on the above information filter from other details from the database using clustering Technique.

TABLE II
CLUSTERING MAXIMUM WIND DETAILS

S.no	Year	Max(wind)
1	2001	65
2	2002	135
3	2003	65
4	2004	140
5	2005	115
6	2006	115
7	2007	140
8	2008	90
9	2009	85
10	2010	65
11	2011	115
12	2012	50
13	2013	55

The table III show the details of MIN(wind) cluster from cyclone data 2001 to 2013.The year 2001 Maximum Wind 35,2002 the maximum wind 55,2003 maximum wind 25 and so on the above information filter from other details from the database using clustering Technique.

TABLE III
CLUSTERING MAXIMUM WIND DETAILS

S.No	Year	Min(wind)
1.	2001	35
2.	2002	55
3.	2003	25
4.	2004	35
5.	2005	35
6.	2006	35
7.	2007	45
8.	2008	35
9.	2009	35
10.	2010	40
11.	2011	35
12.	2012	35
13.	2013	35

The table IV and Figure(2) described clustering comparison report of maximum and minimum cyclone the year of 2001 to 2013.A filter the maximum and minimum wind details from database cyclone. To apply the cluster in this detail out of thirteen details of maximum wind the year 2004 and 2007 it highest maximum wind occurs. The lowest maximum wind 2012.

A filter the maximum and minimum wind details from database cyclone. To apply the cluster in this detail out of thirteen details of minimum wind the year 2002 and 2007 it highest minimum wind occurs. The lowest minimum wind 2003.

TABLE IV
CLUSTERING COMPARISON OF MAXIMUM AND MINIMUM WIND DETAILS

S.no	Year	Max(wind)	Min(wind)
1	2001	65	35
2	2002	135	55
3	2003	65	25
4	2004	140	35
5	2005	115	35
6	2006	115	35
7	2007	140	45
8	2008	90	35
9	2009	85	35
10	2010	65	40
11	2011	115	35
12	2012	50	35
13	2013	55	35

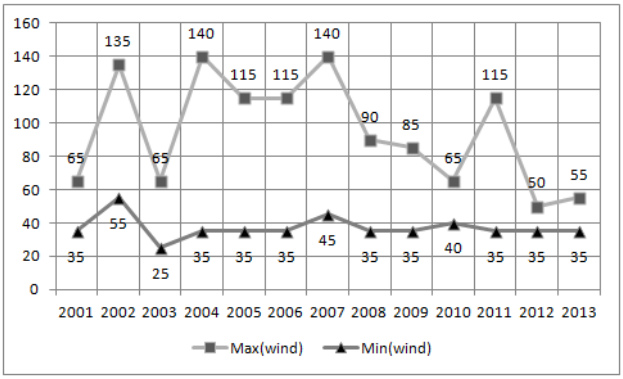


Fig.2 The Cluster Output Result

TABLE V
CLUSTERING ANALYSING REPORT

S.No	Maximum wind range	(%)	Minimum wind range	(%)
1	>100	39	>50	08
2	>70 to <=100	15	>40 to <=50	08
3	<70	46	<40	84

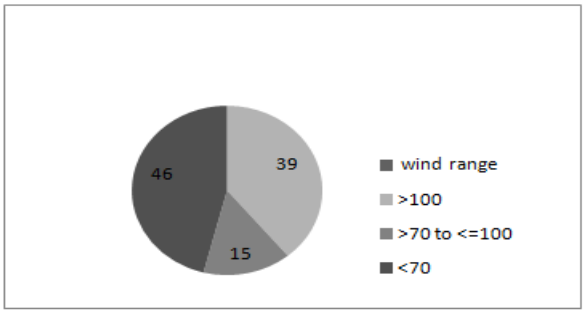


Fig.3 the Cluster Percentage Report of Maximum Wind

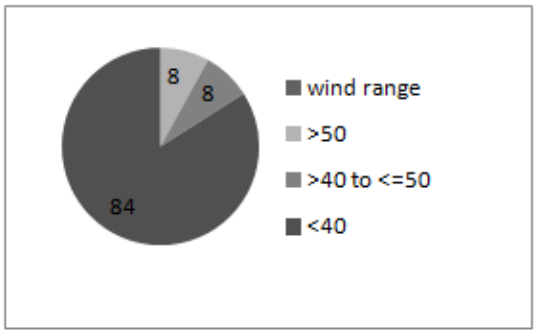


Fig.4 the Cluster Percentage Report of Minimum Wind

The table V, figure(3) and figure(4) describe clustering data analyzation of Maximum and minimum of percentage basis. The above 100 Maximum range 38 percentage, above 70 below 100 the maximum range is 15 and rests of the percentage below 70 percentages the Maximum wind range 46**.** The above 50 minimum wind range 8 percentage, above 40 below 50 the minimum range is 8 percentage and rest of below 40 the percentage of minimum wind range 84.

V. CONCLUSIONS

This paper to describe two different ways of clustering, the first section discussed maximum wind clustering. This will gave knowledge of how to cluster specific constrains object. The second section described about minimum wind data clustering of hurricane data, each wind specifies pressure detail range is different. The cluster output only displayed based on the highest and lowest wind pressure details only. The final report counts
all entries and calculates percentage in that specification.

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