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Prediction model for peninsular Indian summer monsoon rainfall using data mining and statistical approaches

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1 Prediction model for peninsular Indian summer
2 monsoon rainfall using data mining and statistical
3 approaches

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7 **Abstract**

8 In this paper we discuss a data mining application for predicting peninsular
9 Indian summer monsoon rainfall, and propose an algorithm that combine
10 data mining and statistical techniques. We select likely predictors based on
11 association rules that have the highest confidence levels. We then cluster the
12 selected predictors to reduce their dimensions and use cluster membership
13 values for classification. We derive the predictors from local conditions in
14 southern India, including mean sea level pressure, wind speed, and maxi-
15 mum and minimum temperatures. The global condition variables include
16 southern oscillation and Indian Ocean dipole conditions. The algorithm pre-
17 dictors rainfall in five categories: *Flood*, *Excess*, *Normal*, *Deficit* and *Drought*.
18 We use closed itemset mining, cluster membership calculations and a mul-
19 tilayer perceptron function in the algorithm to predict monsoon rainfall in
20 peninsular India. Using Indian Institute of Tropical Meteorology data, we
21 found the prediction accuracy of our proposed approach to be exceptionally
22 good.

23 *Keywords:* Closed itemsets, Association rules, Cluster membership, Dense
24 datasets, Peninsular Indian summer monsoon rainfall, Prediction

25 **1. Introduction**

26 The Indian summer monsoon is an important phenomenon that affects the
27 agriculture sector, contributes significantly to India's gross domestic product
28 (GDP), and plays a major role in socioeconomic growth. Indian summer
29 monsoon rainfall (ISMR) occurs in the months of June, July, August, and

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