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Water Resource Planning and Management using Naive Bayes Algorithm

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ABSTRACT: Dams are the significant wellsprings of water supply to urban communities; they additionally assume an indispensable part in flood control and can help waterway route. Water assets arranging and the executives require issue goal and improved utilization of assets. It is important to execute a type of correspondence between the metering frameworks and PC models to offer help in dealing with the mind boggling frameworks. This paper proposes an incorporated demonstrating system to help with tedious and troublesome errands of dynamic by water the executives professionals and to orchestrate financial employments of water assets. Guileless Bayes Algorithm predicts populace of city from water left in dam water dispersion is accomplished. This two variables, populace and water left in dam, choose how much water should be provided to homegrown and business client so that dam should hold adequate water to dodge water emergency.

KEYWORDS: Artificial intelligence, Internet of Things, Water Distribution System.

I. INTRODUCTION

The creating eagerness on water research has been constrained by various components, for instance, ecological change, urbanization, Industrialization, Agriculture and people advancement requiring new business and development stages to manage the extended level of grouped assortment and multifaceted design of water dissemination the heads. Such change of both water deftly and usage furthermore requires an undeniably intricate and improved unique system. The progressing checking of water resources information, water level in dam information, atmosphere deciding for swirling season will benefit the water scattering the board. The basic thought of Artificial information/Machine slanting and IoT based consistent water information structure is to give exact and thorough information. The system is made idea movement. Some unequivocal water movement limits are portrayed. Water level in dam limit is described for water sum the board. A distant sensor mastermind water resources information noticing is assembled based IoT. Atmosphere deciding for blustery season, requirements of water deftly to the city similarly as plant an area. Finally, the system is delivered for water allocation the heads.

Python is a raised level, interpreted, wise and item arranged scripting language. Python is proposed to be significantly clear. It uses English watchwords as regularly as could reasonably be expected while various lingos use complement, and it has less semantic advancements than other language. Python is Interpreted-Python is set up at runtime by the interpreter. You don't need to mastermind your program prior to executing it. This resembles PERL and PHP. Python is Interactive You can truly sit at a Python instigate and associate with the go between really to make your undertakings. Python is Object-Oriented Python supports Object-Oriented style or strategy for programming that exemplifies code inside things. Python is a Beginner's Language Python is an inconceivable language for the student level computer programmers and supports the improvement of a wide extent of employments from direct substance dealing with to WWW projects to games.

II. PROBLEM STATEMENT

The water supply problems which have been identified within the Region are related to the capacities of the existing water supply infrastructure to meet forecast water supply demands and to the quantity, quality and pressure of the groundwater supplies, and the sustained ability of those supplies to meet probable future needs. Each of the identified problems is described in the following sections, along with the related planning objectives and standards and the recommended basis for resolution. The identified problems are to be specifically addressed and abated or resolved in the regional water supply plan.

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III. MOTIVATION

Now a day, there is big problem of water distribution. Ensuring real time water management and optimization becomes mandatory for resolving the constraints of water supply/demand and to comply with biodiversity requirements. The growing interest on water research has been determined by various factors such as climate change, urbanization, Industrialization, Agriculture and population growth. Such variability of both water supply and consumption also requires a more sophisticated and optimized decision-making process

IV. LITERATURE SURVEY

ChalithaKanchana et al. [1] put the chance of savvy answer for 11 controlling of water level in an incredible water movement system.
Ioan Petri, BarisYuce, Alan Kwan and YacineRezgui [2] give the idea on water improvement and catchment rule and course of action using man-made mental ability method to pass on authentic – time decision help for water the load up and catchment rule with reflection to biodiversity protection and reservation.
CHEN Zhengfa and LIU Guifeng [3] referred to about fundamental man-made thinking strategy for water resource organizing of River Basin which joins ace system, decision genuinely steady organization and adroit improvement count.
Qian ling Guo [4] looks at huge inclination and the system in working out water resources course plan. He furthermore discusses different reasoning structure sketch map.

In spite of the fact that the utilization of DSSs to help catastrophe recuperation endeavors has given gigantic advantages, these frameworks have certain drawbacks. One of the hindrances is the failure to uninhibitedly and quickly move information among people and associations. This is on the grounds that the frameworks and advancements of various associations are extraordinary or contrary. Regardless, DSSs have defeated these impediments and are generally utilized by supervisors. Rajabifard et al. [6] utilized an insightful calamity DSS (IDDSS) as a stage to coordinate street, traffic, geographic, monetary, and meteorological information. IDDSSs are utilized in the administration of street networks during floods. To forestall risky traffic situations, they furnish the law requirement with the specific areas to set up traffic the executives focuses (TMPs) during a crisis. In 2011, Ishak et al. [7] made a calculated model of a keen DSS for store activities if there should arise an occurrence of crises, for example, hefty precipitation. This model can help store administrators settle on exact choices for delivering repository water so that there is adequate space for the delivered water, to dodge neighborhood flooding. Additionally, AI has likewise been incorporated into DSSs to build the dynamic productivity. Dijkstra's calculation can locate the most brief way between two focuses and has a few applications in different territories. This calculation has been broadly utilized in woodland fire recreations [8] and in improving the productivity of course arranging [9]. In 2011, Akay et al. [10] improved this calculation utilizing the Geographic Information System (GIS) to help firemen in deciding the quickest and most secure access courses. This framework requires various spatial information bases, including those of street frameworks and land. Obstruction frameworks have likewise been set up to recreate the situation of restricted streets; consequently, these frameworks are utilized to decide the quickest course as well as to help firemen in distinguishing unexpected situations and deciding protected and solid courses.
A. Water Leakage System Using IOT [11] In this paper, the flow of water through the domestic pipeline can be monitored, forecasted and visualize from anywhere in the world using internet through computer or smartphone. The collected data can be analyzed for making predictions to the users and also for demand management, asset management and leakage management. With the water as flowing liquid the system was tested successfully. The work can be extended to forecast data for larger communities with customer satisfaction involving low cost and better performance of the overall system. According to the author of the paper, the proposed model to forecast and monitor the consumption of water basically consisted of flow meter, micro controller and cloud infrastructure.
B. Smart Water Conservation and Management system using IOT. [12] This paper has given a brief discussion about smart water supply across a particular area by harnessing the technological usage of IOT concept, simultaneously improving the water quality of the drinking water. This idea could be implemented by various governments across the world to save water bodies from drying up caused by excess water usage. This system could also be implemented to reuse the water and also prevent water wastage. Purification and conductivity test of water also played a huge role in the welfare of public which could reduce the overall disease caused due to deficiency, thus creating a healthier society of people.

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C. An Internet of Things Based Model For Smart Water
Distributions with Quality Monitoring [13] Different sensors such as pH sensor, conductivity Sensor, temperature sensor are used for monitoring the water quality in this survey. The values from the sensor are uploaded to cloud by the raspberry PI controller through Internet channel at random interval. The reason for choosing the randomness is to avoid all the devices firing the request at the same time. These values can be monitored location wise in real time.

D. Analysis, Design and Development of an IOT Based Water Management System for Residence [14] this paper describes a water management system design and construction details. Tank1 from the reserve tank automatically turns the pump motor on / off. Tank 1 has two solenoid valves which automatically flows water in two ways. Go to one water filter tank and go to filter water and another tank2. Tank2 has a heater that on by pressing mobile apps button when it needs and turned off automatically, the temperature reaches 35 degrees Celsius and is displayed on the LCD display.

E. An IOT Based Efficient Water Management System [15] In this work, an IoT based efficient water management system, measures the water levels and water quality in storage tanks. It also manages water dispensation and report generation through an user interface. The system also allows the water source at a particular location to be managed and monitored remotely avoiding water wastage and in turn, the water crisis. The whole system is tried out in a closed setup at present.

V. PROPOSED SYSTEM

Data of population, level of dam water, quantity of water supply to domestic user and commercial user is fed as input for training in the form of excel sheet. Input data is current level of water in dam. Naïve Bayes algorithm is applied on training and input data to predict population and water residue in dam. Naive Bayes classifiers are linear classifiers that are known for being simple yet very efficient. The probabilistic model of naive Bayes classifiers is based on Bayes' theorem, and the adjective naive comes from the assumption that the features in a dataset are mutually independent.

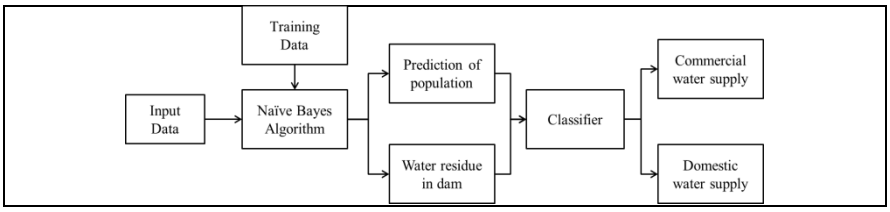

Fig 1. Proposed system

Water residue in am is the quantity of water or level of water in dam will be available on particular date. This is useful to avoid water crisis in future. From population and residue water system decides how much water should be supplied to commercial and domestic user today to avoid water crisis in near future.

VI. ALGORITHM

Algorithm used in system
1. Accept inputs from user (present date, monsoon date, available water, use of water per person)
2. Calculate population growth and industrial by using Asthmatic regression.
3. Calculate water to use (WTU) and water to reserve (WTR).
4. Calculate day wise population growth .
5. Calculate day wise industrial growth .
6. Determine allocated water (AW) to domestic and industrial use.
7. If water to use (WTU) is less than allocated water (AW) then go to step 9 .
8. If water to use (WTU) is more than allocated water (AW) then keep on deducting allocated water till WTU becomes less than allocated water AW.
9. Generate excel sheet to get good visual analysis.

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VII. EXPECTED OUTCOME

Here as we can see,the user has to enter present date and then you the until next monsoon the water availability will be calculated and displayed,the water needed for per person in liters will be calculated.The prediction/the calculation/the exact working at naive bayes algorithm is here that's what make this module the core part of our project.

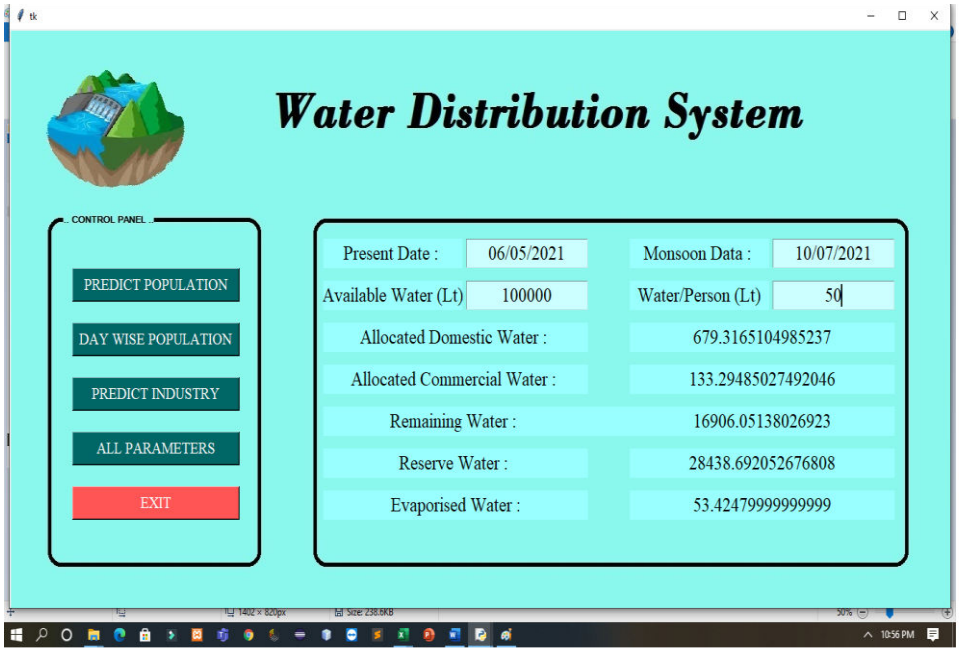
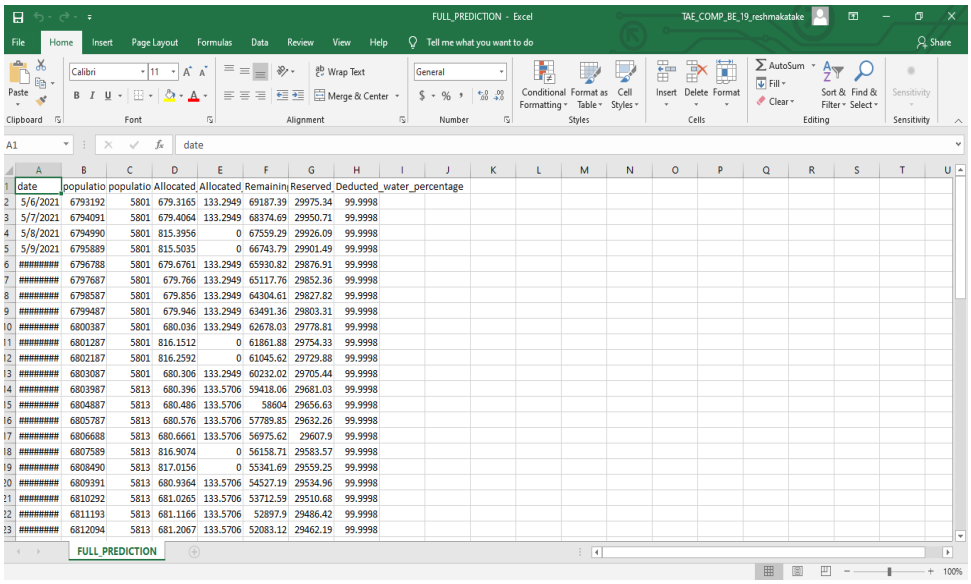


Fig.3.PredictedOutcomeof Input Parameters



date	population	population	Allocated_	Allocated_	Remaining	Reserved_	Deducted_	water_percentage
5/6/2021	6793192	5801	679.3165	133.2949	69187.39	29975.34	99.9998	
5/7/2021	6794091	5801	679.4064	133.2949	68374.69	29950.71	99.9998	
5/8/2021	6794990	5801	815.3956	0	67559.29	29926.09	99.9998	
5/9/2021	6795889	5801	815.5035	0	66743.79	29901.49	99.9998	
########	6796788	5801	679.6761	133.2949	65930.82	29876.91	99.9998	
########	6797687	5801	679.766	133.2949	65117.76	29852.36	99.9998	
########	6798587	5801	679.856	133.2949	64304.61	29827.82	99.9998	
########	6799487	5801	679.946	133.2949	63491.36	29803.31	99.9998	
########	6800387	5801	680.036	133.2949	62678.03	29778.81	99.9998	
########	6801287	5801	816.1512	0	61861.88	29754.33	99.9998	
########	6802187	5801	816.2592	0	61045.62	29729.88	99.9998	
########	6803087	5801	680.306	133.2949	60232.02	29705.44	99.9998	
########	6803987	5813	680.396	133.5706	59418.06	29681.03	99.9998	
########	6804887	5813	680.486	133.5706	58604	29656.63	99.9998	
########	6805787	5813	680.576	133.5706	57789.85	29632.26	99.9998	
########	6806688	5813	680.6661	133.5706	56975.62	29607.9	99.9998	
########	6807589	5813	816.9074	0	56158.71	29583.57	99.9998	
########	6808490	5813	817.0156	0	55341.69	29559.25	99.9998	
########	6809391	5813	680.9364	133.5706	54527.19	29534.96	99.9998	
########	6810292	5813	681.0265	133.5706	53712.59	29510.68	99.9998	
########	6811193	5813	681.1166	133.5706	52897.9	29486.42	99.9998	
########	6812094	5813	681.2067	133.5706	52083.12	29462.19	99.9998	

Fig.4.PredictedOutcomeStored In Excelsheet

The final outcomes of all inputs parameters are stored in excel file.

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VIII. CONCLUSION

The proposed system is completely founded on forecast. Estimation of water supply is relied upon forecast esteem. So it is fundamental to upgrade forecast exactness. Result for expectation of populace is contrasted and forecast of Ontario Tech University for the equivalent. The normal % deviation is near - 3 % over the time of 80 years anticipated information. Notwithstanding expectation of populace and industry some more boundaries are considered for better estimation like disintegrated water, hold water, necessity of water per individual on week days and end of the week, Requirement of water of industry every day insightful and so forth In this framework change in populace and industry is viewed as every day insightful. These everything make this sys-tem more solid and precise for choice help of water dissemination. The vital idea of this framework is uniform allowance in water supply on everyday schedule considering day by day populace change and industry development over the time of next storm. The precision of result in derivation of water is extremely high.

REFERENCES

1. ChalithaKanchana, ThilinaJayaweera, Sarindajayasinghe, DhamsaraJayawardana, NalinWickramrachchi. “Intelligent Water Management System with Remote Access and Monitoring”, 2013 IEEE First International Conference on Artificial intelligence, modeling & Simulation.
2. Ioan Petri, Barisyuce, Alan kwan, YacineRezgui. “An intelligent analytics system for real-time catchment regulation and water management”. IEEE TRANSACTIONS ON INDUSTRIAL INFORMATICS, VOL. 14, No. 9, DEC 2017, PP:3970-3981
3. CHEN Zhengfa, LIU Guifeng. “Application of Artificial Intelligence Technology in Water Resources planning of River Basin”, 2010 IEEE International Conference of Information Science and Management engineering
4. Qian ling Guo, “The application of AI in working out Water Resources Distribution Plan”, 2011 IEEE 2nd International conference on Artificial Intelligence
5. Shifeng Fang, Li Da Xu. An Integrated System for Regional Environmental Monitoring and Management Based on Internet of Things[J], IEEE TRANSACTIONS ON INDUSTRIALINFORMATICS, VOL. 10, NO. 2, MAY 2014,PP:1596-1605.
6. Chen Tao, Xu Ling, Su Guofeng, Yuan Hongyong, Huang Quanyi, Architecture for Monitoring Urban Infrastructure and Analysis Method for a Smart-safe City. 2014 Sixth International Conference on Measuring Technology and MechatronicsAutomation.pp:151-154.
7. Tomás Robles, Ramón Alcarria, Diego Martín. An Internet of Things based model for smart water management. 2014 28th International Conference on Advanced Information Networking and ApplicationsWorkshops.pp:821-826
8. Yongzhi LIU, Wenting ZHANG, Xinmin CUI, Guodong ZHANG, Gaoxu WANG, City Pipe Network Intelligent Service Based on GIS and Internet of Things. 2014 7th International Conference on Intelligent Computation Technology and Automation.pp:936-939.
9. ThiyagarajanManihattyBojan, Umamaheswaran Raman Kumar,ViswanathanManihattyBojan,An Internet of Things based Intelligent Transportation System. 2014 IEEE International Conference on Vehicular Electronics and Safety (ICVES).pp:174-179.
10. Ke Wang, Wenxue Ran, Gang Wu.Application of Pan in content networking technologies on Ecological Real-time Monitoring of Plateau Lakes. 2011 4th International Congress on Image and Signal Processing.pp:2467-2472.
11. Mrs. Sarswathi V, Internatioal Journal of Innovative Research in Engineering and Management (IJIREM), volume-5, issue-2, march-2018.
12. AnirudhDas.B, K.S.Srivatsava, Pradeep Doss. “Water utiliry monitoring and control using IOT based approach” IJECT volume9, Issue-2, april-june 2018.
13. Joy shah, International journal of innovative research in science,engineering and technology. Volume-6, Issue-3, march2017.
14. Sangeetasarkar, Susmithasikder, Saifulislamashik, Ayesha siddika, Global scientific journals, GSJ: volume-6, Issue-10, october 2018.
15. N.Yazhini, Faustina Joan S P, International conference on advancements in computing technologies, ICACT 2018: volume-4, Issue-2

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