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Advanced Water Management System using Android

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Abstract: ***In this fast-paced world people are not able to give attention to their daily work like the water management in their house, taking care of their pets etc. In many cities, corporation water comes after two to three days and it has one fixed timing of two hours only. At the same time you are out of the city or want to go out you can't because someone should be present at the house at the same time to fill the water tanks. On that problem statement we design one system in which you can operate all the cocks, motor from anywhere through Android. There is one thing that in this fast world everything has got smarter so we are trying to give a very smart solution by the use of technology. Which is easy to manoeuvre and access. So that everyone will be benefited by it. We have used the existing technology to get the solution.***
Keywords: Atmega, ESP-32, IOT, Water management.

I. INTRODUCTION

In many cities, corporation water supplies after two or three days and it has one fixed timing of two hours only. At the same time, you are out of the city or want to go out you can't because someone should be present at the house at same time to fill the water tanks. On that problem statement we design one system in which you can operate all the cocks, motor from anywhere through Android. The task of maintaining the daily household work has become more advanced in this era and many types of devices are there for it and here we have made a system in our own way to tackle the problem.

Water Management System is an automated system for water to make life easy and comfortable via use of android. Now I would like to take the case study of our country. In the metropolitan or the urban area most of the people are working people. And they are on their duties from morning to evening. And the water timing in the cities collided with their duty rims so that they were not able to get their tanks or reservoirs full. Also, if there is a pet in their house who needs to be fed at the right time then another problem adds to this water problem.

Also, sometimes it's dangerous to control the motors and the borewell with the help of switches because if a child touched it then it would be very difficult. Similar cases are there in villages and the rural or the semi urban areas. In fields water and the electricity time is irregular so they have to go to the fields according to that time, and mostly the fields are away from the house so it's become difficult. So, to conquer this problem of time management and the impossible reach to the place we have provided a solution using the hardware and the software. It will make them comfortable and carefree about the work.

For this we have gone through the several existing systems and the research papers so that we can improvise the existing system. Like one of the main problems is long distance control.

Because if we are out of place then also, we should be able to control the system. And so many little issues we have tried to clear in a cost-efficient manner so that it would be afforded by everyone. And this is what the meaning of technology is: it should be easy to access and cost efficient.

II. LITERATURE REVIEW

Numerous significant research studies and experimental projects using different data mining techniques have been carried out, proving the importance and necessity of these technologies in the management of water resources.

The Evolutionary Polynomial Regression (EPR) method, developed by Orazio G. et al., makes use of a polynomial structure with exponents selected by an evolutionary search to produce symbolic expressions. In order to predict the frequency of pipe burst failure in the water delivery system, he conducted a case study on the UK water distribution system. He identified a number of characteristics, including pipe age, material, and diameter, soil corrosivity, weather, traffic loads, internal pressure, and others, but it is very challenging to gather this information. Then in 2003 Savic et al. used a classification strategy to analyse the same dataset.[1].

Elia G. P. chose a decision tree because it is a popular decision-assistance tool and is straightforward and simple to comprehend. They employed the classification and regression trees (CART) method to predict the weather. They used the free data mining software WEKA to create the decision tree using data collected from Hong Kong between 2002 and 2005. (Waikato Environment for Knowledge Analysis). The database was built using year, month, average pressure, cloud cover, relative humidity, average precipitation, and temperature data. They converted the data so that it could be used in WEKA, a graphical user interface that has algorithms and visualisation tools for data analysis and predictive modelling. They were very accurate in predicting the average temperature for the upcoming months. [2].

In order to forecast the amount of rainfall that will fall in a specific place over the course of the following year, M. Kannan et al used the regression method using the Karl Pearson Correlation Coefficient. During the winter, they received data from the Statistical Department of Tamil Nādu in Chennai covering five years (September, October, and November). They discussed employing weather forecasting techniques to foresee rain. Empirical and dynamic methods can be used interchangeably in theory. The empirical method is based on historical rainfall data and its relationships to meteorological and oceanic causes. Examples of frequently used prediction techniques include fuzzy logic, artificial neural networks, and regression.[3]

In the dynamic method, predictions are made using physical models and are subsequently carried out using numerical rainfall forecasting. To predict impending precipitation [3], they adopted an empirical strategy. The results show that, as a rough estimate, the predicted values are lower than the computed values.

Pinky S.D. used data mining techniques to predict Assam's monthly rainfall. Over a six-year period, she used multiple linear regression to examine data from the Regional Meteorological Centre in Guwahati, Assam (India).

III. COMPONENTS

A. Hardware Requirements

1) Servo Motor.
2) Water Pump.
3) ESP-32 Module.
4) Arduino MEGA.
5) LED’s (GREEN, RED, YELLOW)
6) Resistors
7) Zero PCB Board and pin headers
8) Battery
9) WiFi Connection
10) Relay Module 5v

B. Software Requirements

1) Arduino IDE
2) Arduino cloud.
3) Android studio

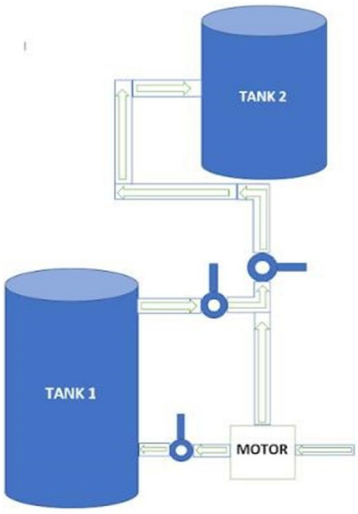
If one want to design own app to control system)

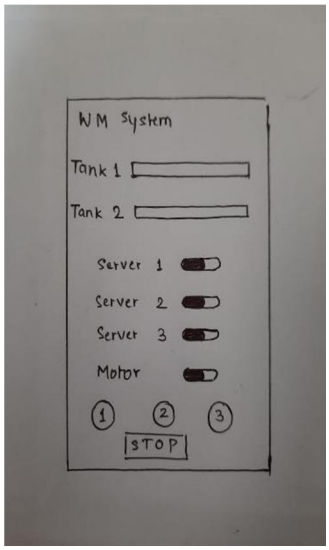
IV. METHODOLOGY

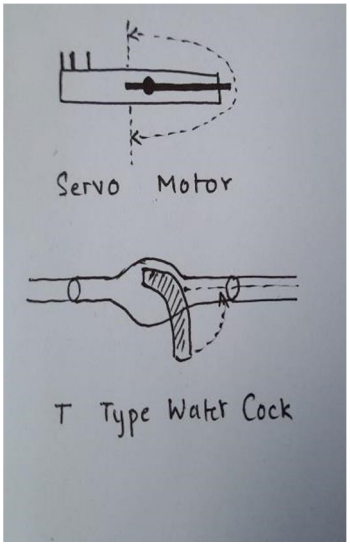
Basically, we are doing this project to access water cock from anywhere and for saving water wastage. For that purpose, we design one system in which we design 2 sensors for sending water level of the tank to the Arduino and that sensor data will be sent to ESP32 module through Serial communication. Then that data will be sent to a web server/app. So, you can get to know the level of the water tank from anywhere. Then as you may know generally T-Shape water cock are used to operate the ON-OFF operation of flow of water so we are going to connect Servo motor of high torque to that cock so whenever you want to turn ON/OFF the cock you can rotate it through Servo by sending commands from Arduino to servo.

A. Working

In many cities corporation water comes after 2/3/4 days so these locality people store water in big quantity. As you see the working prototype diagram below, there are 2 tanks main tank is tank - 2 (upper) .so when the water in tank 2 over then we will transfer water from tank - 1 to tank – 2 through motor. And when corporation water comes at that time, we have to fill both the tanks.







According to diagram

1) Case -1:- (at the time of corporation water)

At that time we have to fill both the tanks (initially all the cocks are off) so, consider Servo-1 connected to lower cock, Servo-2 connected to middle cock , Servo-3 connected to upper cock. If you want to fill tank-1 then send command through your mobile as ON so Servo2 will rotate through 90 degrees and cock will turn ON next turn MOTOR ON. Then the water will fill in Tank-1. Now at the time of filling Tank-2 keep motor ON and send command Servo2 OFF from your android so Servo-2 will be rotate by 90 degree means middle cock will turn off and send command Servo-1 ON the upper cock will rotate by 90 degree means that will turn ON so all water will transfer to Tank-2. By this method we can fill water storage from anywhere so there is no need for someone to stay in our house to fill water in tanks.

2) Case- 2: - (corporation water is not available so we have to transfer water from tank-1 to tank2 using android)

For that purpose, we have to keep the middle one cock OFF and lower & upper will be ON. Just send commands as Servo-1 & Servo-3 ON from your android so that ESP-32 will receive that signal and it will send it to Arduino then Arduino sends command to Servo rotate by 90 degree then lower and upper cock will turn ON. Next is turn the motor ON so that Water will transfer from Tank-1 to Tank-2.

B. Flowchart

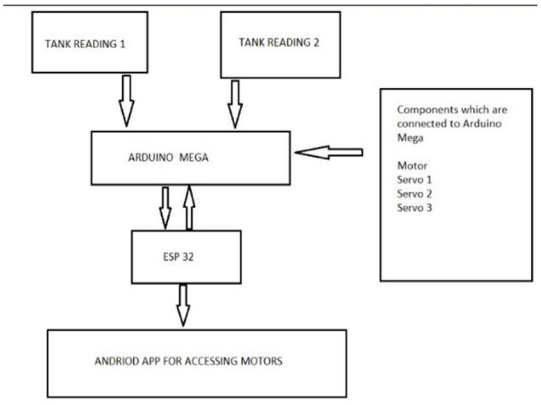


Fig 1 : Flowchart of the Model

Fig 1: Flowchart of the model

V. RESULT AND DISCUSSION

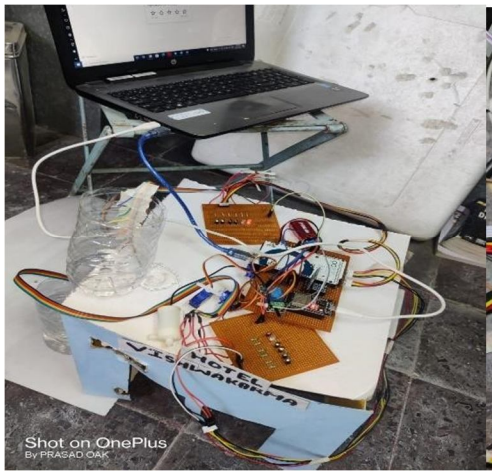


Fig.1:- complete model

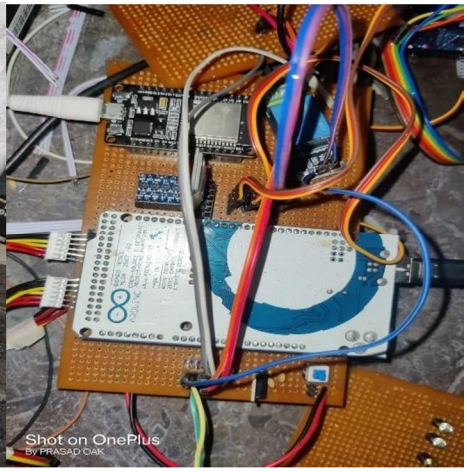


Fig 2: circuit

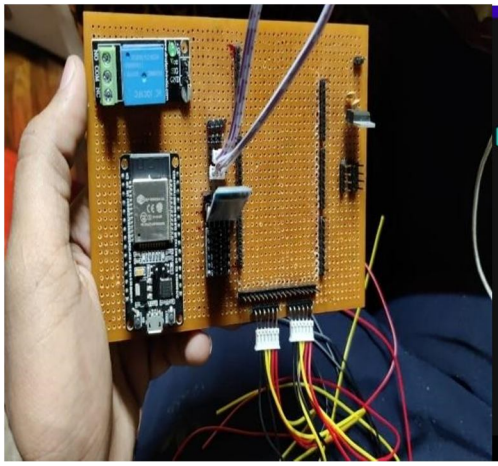


Fig.3 – circuit design

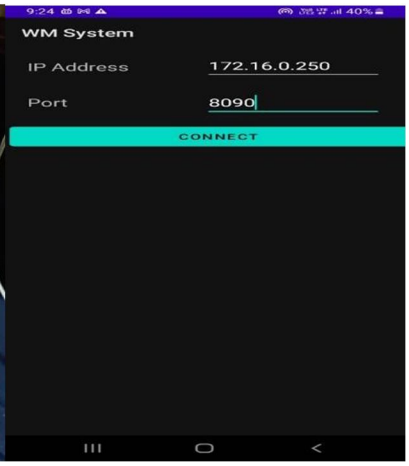


Fig 4 : Applications first window

Fig 5: App's page where all controls of circuit are shown

VI. LIMITATIONS

Our system may lead to some syntactical errors. The system may crash down due to failure of the software platform running at present time. Loss of internet connection may disconnect your connection. The system may lead to malware attacks.

VII. FUTURE SCOPE

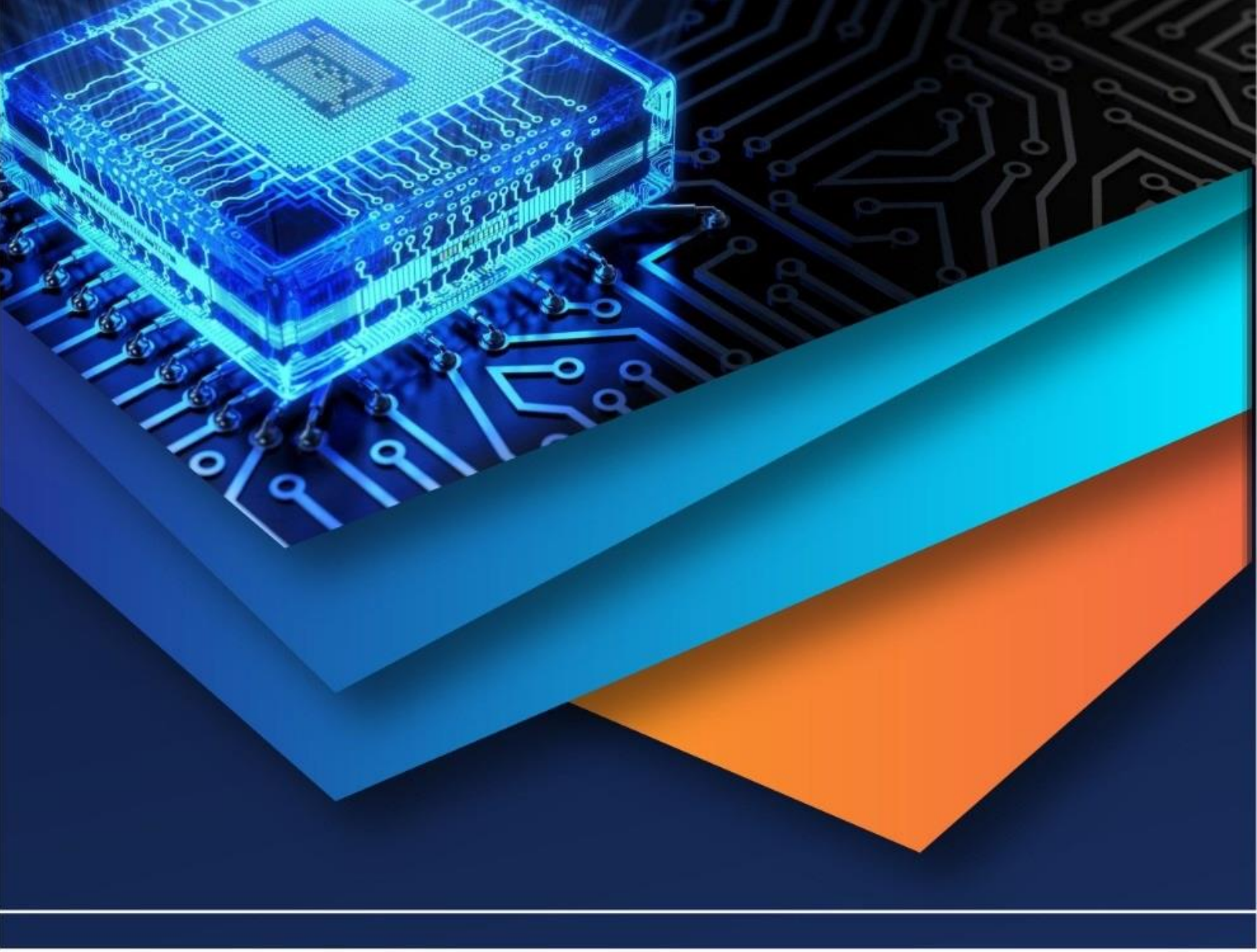
In the future counting theory may become more advanced with its counting technique. Making it a more user friendly system for solving mathematical problems.Creating new technologies for solving with support of counting theory. Online calculators may be one of the good aspects in including all the counting techniques so easy and efficient calculations.

VIII. CONCLUSION

This work was to seek out learning problems in counting theory and to means deficiencies with which the traditional established teaching approaches for these concepts. An important aim is to find the ways for meaningful learning and to make the teaching and learning more effective and useful in all aspects. We mainly looked at four concepts namely permutation, combination, inclusion-exclusion principle and rule of sum to show the deficiency of students and also provided possible reasons for that. A large chunk of problems is very easily solved by counting theory techniques which nowadays help to solve problems. We also suggest a more effective and meaningful way of teaching these concepts using concept maps. Linking these concepts to pure math can make things better. In addition, emphasize that when inferring by counting arguments, it is necessary to relate the new conclusion to the statement of the problem.

REFERENCES

[1] Giustolisi, Orazio, Dragan A. Savic, and Daniele Laucelli. "Data mining for management and rehabilitation of water systems: the evolutionary polynomial regression approach." Risiken bei der Bemessung und Bewirtschaftung von Fließgewässern und Stauanlagen 27 (2004): 285296.
[2] Petre, Elia Georgiana. "A decision tree for weather prediction." Universitatea Petrol-Gaze din Ploiesti 61, no. 1 (2009): 77-82.
[3] Kannan, M., S. Prabhakaran, and P. Ramachandran. "Rainfall forecasting using data mining technique." (2010).
[4] Dutta, Pinky Saikia, and Hitesh Tahbilder. "Prediction of rainfall using data mining technique over Assam." Indian Journal of Computer Science and Engineering (IJCSE) 5, no. 2 (2014): 85-90.
[5] Khandelwal, Neha, and Ruchi Davey. "Climatic assessment of Rajasthan's region for drought with concern of data mining techniques." Concern 2, no. 5 (2012).



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