Smart Time-Table Scheduler using Machine Learning

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Abstract: An individual/student is involved in multiple tasks in daily life. Time management is considered to be the skills that should be mastered by all the individuals at all levels and in all walks of life. Many People use manual way of preparing timetables for each and every day which can be time consuming. They usually end up with not following the timetable. Time-Table is not a new concept, there are many timetables creation and generation software for colleges that are limited for only colleges and students. Also, with the help of advancement in technologies, using it to solve daily life problems is a boon as well. To overcome all these problems, we propose the system that takes various inputs such as profession, Hobbies and depending on these details we will form clusters and apply K-Nearest Neighbors Algorithm to give suggestions based on these clusters formed. K-Nearest Neighbors Algorithm makes clusters of the people with same profession and interests and when a new member joins similar schedule will be suggested. This Project also uses Market Basket Algorithm for Suggesting changes made by people in same cluster. The time table formed can be modified by the user at any moment making the utilization of all these resources in a way that will suit any type of person. Although we expect that the users are required to give the correct details for the expected required suggestion.

Keywords —Time-Table, KNN, Market Basket, Machine learning, Django

I. INTRODUCTION

Goals being the most important thing in aspect of growth of a person or a company, we thought of helping everyone accomplish their goals. There are many ways of accomplishing a goal. Breaking long term goal to short term goal, keeping an average of work to be done in a particular time, to keep daily goals. Whatever the method is, it's not effective without a proper schedule, most successful people have fixed timings for all the activity to do each and every work efficiently in this digital world, many such scheduling plans were made and never followed due to the lack of flexibility.

We feel flexibility is the core of scheduling as hard-wired deadlines make it difficult to follow the schedule also once the deadline is met the motivation to follow further goes away. So, we are trying to bring. Smart scheduling digital method for people who respect their goals, their time and their own value

Time-Table schedulers have been around for quite a long time. Reasons for the sudden renewed interest in Time-Table scheduler include massive advancement in artificial intelligence (AI) and Machine Learning (ML). Until now Time-table schedulers were mostly used to create time tables for schools or colleges. We plan to expand the usage of these

Time-Table schedulers for Personal and professional usage as well.

The system tries to give accurate timetable schedule for a person with particular Profession and hobbies/interests using the data of the users it already has who have the same profession as well as same hobbies/interests. This is done by using machine learning which suggests the daily schedule based on the users with same qualities and interests to give the refined and optimum results. Our website will be built using artificial intelligence and machine learning that will analyze the user profession and hobbies. This system will have a web interface that will provide an optimal schedule to the user.

II. LITERATURE SURVEY

[11] Timetable by Alexendra Liager presented the usage of android app to make timetable schedulers, the whole process is manual and user need to give input for each and every timeslot. [13] Timetable planner with alarm for study was presented by Damda to use an android app for week scheduling and comparison with other students, resulting in no free time selection and only useable at student level.[12] Automated College Time-Table Generator was made for generating automated time table at college level. It was strictly restricted for college premises. Also, [10] Web

Application for Automatic Time Table Generation and [1] Electronic Lecture Time-Table Scheduler Using Genetic Algorithm was developed to overcome lecture time-tabling that was done manually, but still it has been restricted to school and college usage. The usage of KD-KNN-LR for marriage recommendation system as well as Music Personalized recommendation system using improved KNN Clustering algorithm helped us with an idea of using KNN Clustering algorithm for our project.

III. PROPOSED METHODOLOGY

The proposed method is creating a web-application which can be used by anyone who values time. The web-application has various modules which works simultaneously to give user a time table schedule using machine learning. The software and frameworks used are Python, Django web framework, SQLite3 and web technologies. The System is divided into 3 layers which are application layer which has user and the Dashboard the basic details are then sent to machine learning algorithm and database to be stored into the dataset; this dataset will be used to make the algorithm accurate.
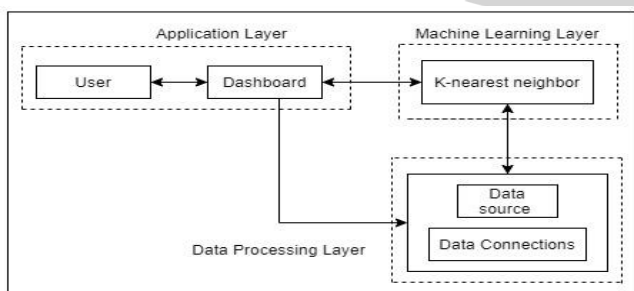

Figure 1: system architecture

According to system architecture as shown in Figure 1, The user interacts with the Dashboard which internally is connected with the Machine Learning module and the database module for the output by the machine learning module and user data from the Database module. The machine learning module is connected to database module to get the dataset to train the KNN model from the database.

The modules are as follows-

Login/Signup module - The login signup module as the name suggests is used to allow only legitimate users to access their private space and edit time-table schedule. New users can sign-up to use the web-app as shown in Figure 2
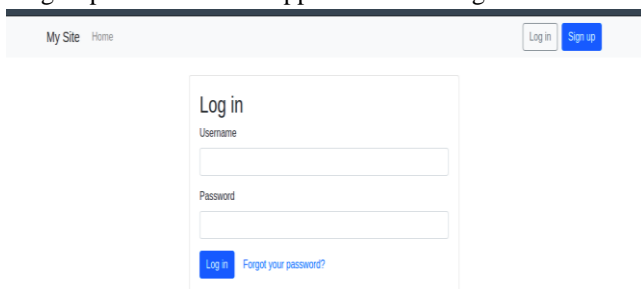

Figure 2: Screenshot of Login Page

Machine Learning module – We have used k-nearest neighbor module to cluster the dataset based upon the people's professions and hobbies and then to cluster them whenever a user joins, he will get the time table schedule recommendation using the dataset we already have. The KNN module is triggered every time a user log-in the app.

Dashboard Module - All the user interaction takes place on dashboard where he can make new time-table, edit already existing timetable, make connections delete connections also can view his/her connections timetable schedule. The dashboard shows the user's time-table schedule as shown is Figure 3 and the connection's schedule us shown in Figure 4.
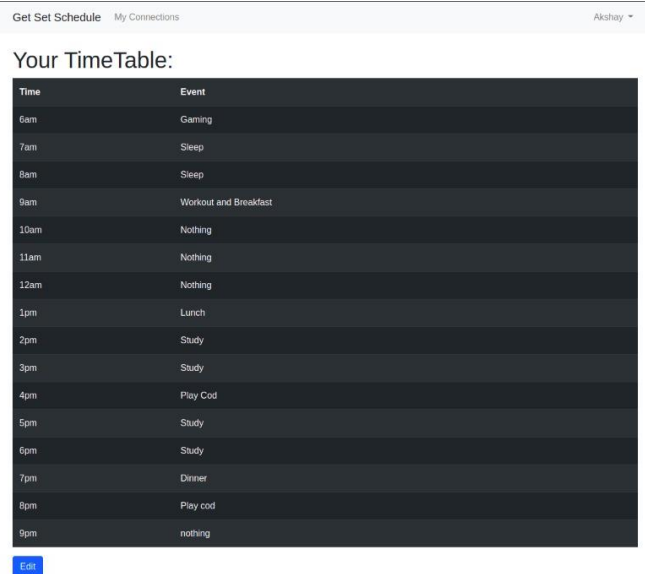

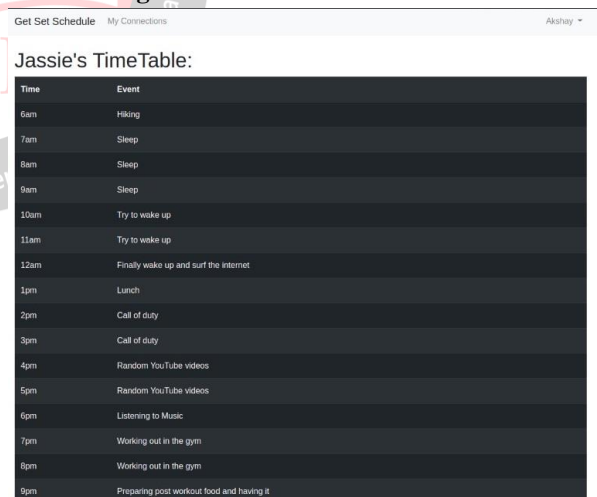**Figure 3:** Screenshot of Dashboard

Figure 4: Screenshot of Connection's Schedule

Database Module - This module is responsible for storing of all the user data as well as the time-table dataset once the user saved his or her schedule his/her time table will be added to the dataset to make our machine learning module accurate.

IV. RESULT ANALYSIS

We put our model to the test on variety of professions and hobbies and it performed admirably well. There was no exact

existing system so we compared our outcomes with [1] Electronic Lecture Time-Table Scheduler Using Genetic Algorithm which uses genetic algorithm which is limited to lecture time-table schedule only. On the contrary, we used KNN algorithm and a clustering approach. Figure 5 shows the comparison between proposed system at topside and Electronic Lecture Time-Table Schedular Using Genetic Algorithm at downside.
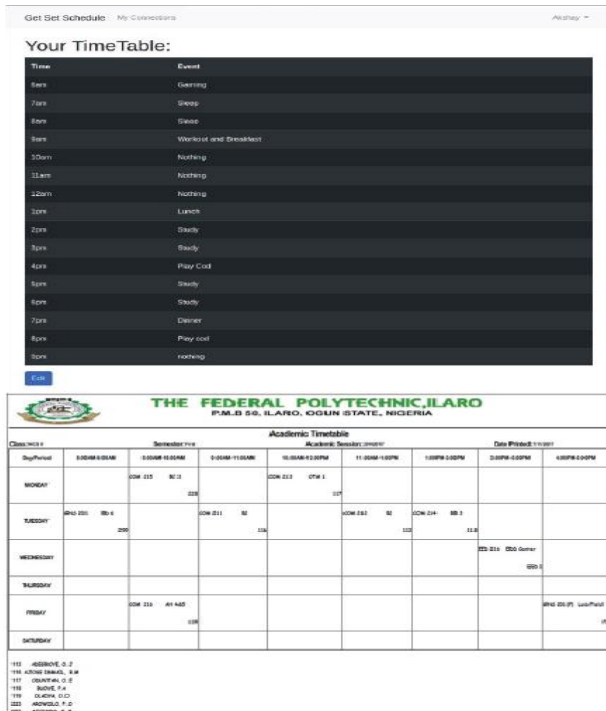

Figure 5: Result of Proposed System vs Existing System

V. CONCLUSION

The overall system performance is well having few anomalies due to small datasets. But the system is able to accept the inputs of user, to be specific inputs as hobby and profession. Also, it has been not only limited to the school friends or college classes but to each and every working and non-working professional. The dashboard is easy to access by the users. The system is robust as it works effectively for being used by individuals of various domains delivering a good quality of services through a new possible way by schedule recommendations of similar professions and hobbies. It is user friendly and the system gives a quick and expected response for clusters that are present. As for new users' input, if the cluster was not present new cluster were formed. The efficiency and accuracy of machine learning algorithm will be increased by storing users' input resulting in new cluster formation and adding dataset for training the machine learning module.

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