College Admission Acceptance Chance Based on Merit and Personality

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***Abstract*— With multiple universities to choose from, students find it challenging to select a university/college that is a perfect fit for them. In addition to their scores and grades, students should be able to select colleges that are a good fit for their personality. Personality is a set of emotional, cognitive, and behavioral qualities that are uniqueto each individual and frequently remain consistent through time. This article proposes a system for curating a list of schools for the user based on their geographical choice, GPA, test results, and personality, using a personality test inspired by the Myers-Briggs personality types and an ML model for estimating the college acceptance rate.**

Key Words: College Acceptance, Personality Prediction,Myers-Briggs, Higher Education, Admissions

I. INTRODUCTION

Students typically base their college selection on their GPA and test scores. The inclusion of a personality trait intheir selection may improve their college experience.

[1] "Personality is the dynamic organization within the individual of those psychophysical systems that determine his characteristics behavior and thought" (Allport, 1961, p.28).

[2] "The characteristics or blend of characteristics that make a person unique"(Weinberg & Gould, 1999).

Both of these definitions of personality help us recognize how unique each individual is, underlining the reality that every student will benefit from a different learning environment.

The proposed system will identify the user's personality type and generate a list of universities based onGPA, test scores, University rating, and research work. The list will give a predicted acceptance chance, along with the personality type that is most likely to thrive in each university.

II. PERSONALITY PREDICTION

[3][4]Kulsum Akter Nisha, Umme Kulsum, Saifur Rahman, Md. Farhad Hossain, Partha Chakraborty, and Tanupriya Choudhury conducted a comparative analysis ofmachine learning approaches in personality prediction. According to the publication,

"Personality classification is the task of detecting a personality by different categories of measurement. It describes a pattern of thought, feeling, and features that fore-casts and illustrates an individual's actions and also influences activities of daily life, such as attitudes, desires,motives, and health."

[5]In 2020, Murphy, L., Eduljee, N.B., Croteau, K., & Parkman, S. worked on an empirical study that examined the relationship between Myers-Briggs Type Indicator (MBTI) personality types and preferred teaching methods for 507 Saint Joseph's College of Maine undergraduate students. The study is evidence that various personality types prefer different teaching methods.

[6]Numerous studies have examined the relationship between personality type and preferred teaching methods in the classroom. In 2017, Laurie Murphy, Nina B. Eduljee, Karen Croteau, and Suzanne Parkman investigated preferred teaching techniques with 73 (39 male, 34 female) undergraduate college students. The study shows that extraversion-introversion (E-I) differences have an impact on how students become engaged during classroom time, the actions or steps they take to learn and understand course content, and the way they process information.

[7]The four fundamental meta modules in Figure 1, commonly known as the Myers–Briggs Type Indicator® (MBTI), characterize an individual's preferences in four dimensions, which combine to form one of 16 possible personality types.

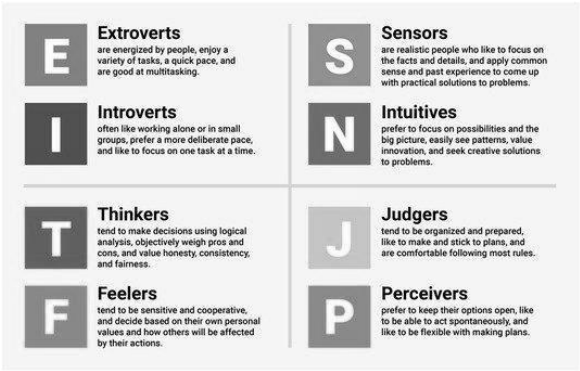


Fig. 1. Personality Keys[4]

Using the 8 keys in figure 1, the 16 Myers and Briggs' Personality Types are:

1. ENTJ - The Commander
2. INTJ - The Mastermind
3. ENTP - The Visionary
4. INTP - The Architect

5. ENFJ - The Teacher
6. INFJ - The Counselor
7. ENFP - The Champion
8. INFP - The Healer
9. ESTJ - The Supervisor
10. ISTJ - The Inspector
11. ESFJ - The Provider
12. ISFJ - The Protector
13. ESTP - The Dynamo
14. ISTP - The Craftsperson
15. ESFP - The Entertainer
16. ISFP - The Composer

Taking inspiration from these personality types and theMyers and Briggs personality test, we curated a set of questions suited for our platform's users (i.e. students looking for a university suitable for them). Further, depending on the user's answers, the user is assigned one of the four following the personality types -

1. Nerd
2. Pragmatic
3. Humanitarian
4. Artistic

III. ACCEPTANCE CHANCE CALCULATION & DATASET FOR TRAINING THE MODEL

The entire college admission process is fairly subjective.It is an amalgamation of different factors that include butare not limited to grades, standardized test scores, references, previous education, and extracurricular activities.

In fact, these factors change a lot from college to college.One example is given below :

[8]As we carefully and respectfully review every application, two questions guide our admissions team: "Who is likely to make the most of Yale's resources?" and "Who will contribute most significantly to the Yale community?" - Yale college undergraduate admissions.

Dataset used in this project is gathered from various reliable sources on the internet. To prevent/avoid biases, we have gathered the average score of students who got admission as well as rejection for each university in the California state, USA.

[11]To better understand the admission process, we referenced the paper 'College admissions in

twenty-first-century America: The role of grades, tests, and games of chance. This paper goes on to criticize the importance of standardized tests in the admission process and claims that far too much importance is given to such tests. Our findings are also consistent with this claim, as we can see from Graph 1, the GRE score is the most important feature while deciding admission chance.

Although standardized tests have been criticized, they arestill one of the most important admission factors and mustbe given importance while predicting the acceptance chance.

Standard Scaling Technique - we have used to avoid overfitting of the data, We have different ranges of value eg 0-5, 260-340, 0-120 because of this the model becomes biased. hence we use scaling to remove the biases of the model.

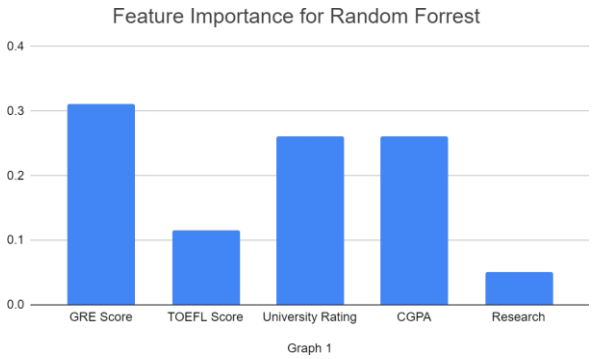
[9]In the paper 'Research on Recommendation of Insurance Products Based on Random Forest', the authors comparedRandom Forest, ID3 (Decision Tree), C4.5, Nave-Bayes, and Nearest-neighbor algorithms and concluded that the prediction errors of the random forest algorithm are the lowest.

The success rate of each personality type at each university is also very important in determining the right choice for the user. [10]Taking inspiration from the paper, Role of the Big Five personality traits in predicting collegestudents' academic motivation and achievement, we were able to come up with better results by factoring success rate into our dataset.

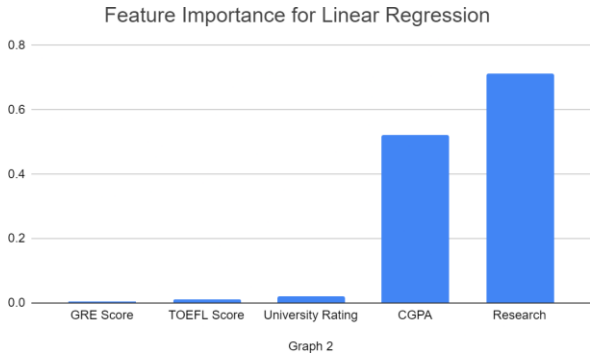
Similarly, we compared 4 different algorithms for trainingand testing the data:

1. Simple Linear regression
2. Artificial Neural Network
3. Decision Tree
4. Random Forest

Out of these models, Random Forest gives the best result to fit our requirements, which is higher weightage on GREscore, TOEFL score, university rating, CGPA, and Research as seen in Graph 1 and Graph 2.



Graph 1



Graph 2

Proposed System:

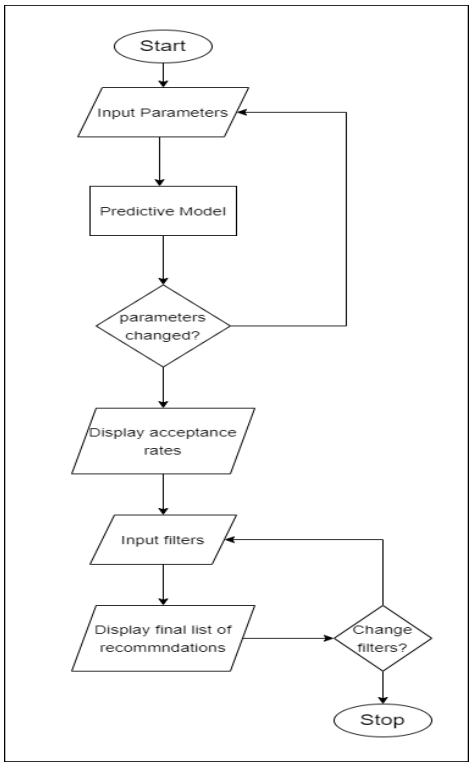


Fig. 2. Proposed System

IV. DEVELOPMENT TOOLS

Python provides simplicity, consistency, flexibility, and access to great libraries and frameworks for our machine learning (ML) models and platform independence.

To create a usable tool, we decided to build a flask application. This allowed us to have a RESTful architecture, which subsequently enabled us to create an interactive and responsive interface with the help of industry-standard front-end tools like HTML, CSS, and Javascript (primarily jQuery).

Using flask, we can also create a REST API for our backend code, allowing it to be integrated into otherwebsites or applications.

V. MARKET RESEARCH

Although there are several products in the market that predict admission rates based on a student's GPA, test scores, and extracurriculars, there are no current systems that provide the user with a curated list of universities along with the personality types that thrive in the university's learning environment.

Several existing products also show a bias toward users who use various services provided by them throughout the application process, while charging the users a substantial fee.

VI. FUTURE ENHANCEMENTS

The suggested system is designed from the standpoint of astudent; a similar system may be designed for universities.It will let the admissions committee learn about the applicants' personalities as well as their academic and professional accomplishments. It will assist institutions in admitting students who are a good fit for them.

VII. CONCLUSION

A student is much more than just his/her grades, the added feature of personality will enable students to choose from universities that have a teaching environment that is favorable for their personality.

The primary goal of this application is to give students the correct university for their unique personality type. A student may get into multiple universities with their academic and professional profile, but that does not mean that each of those universities is a good option. This further causes even more confusion and indecisiveness which is what we aim to mitigate.

The system's outcomes, however, do not guarantee admission or rejection at any university; rather, the systemshould be used for compiling a list of suitable universities.Additionally, the system will assist users in understanding where they stand in comparison to other applications.

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