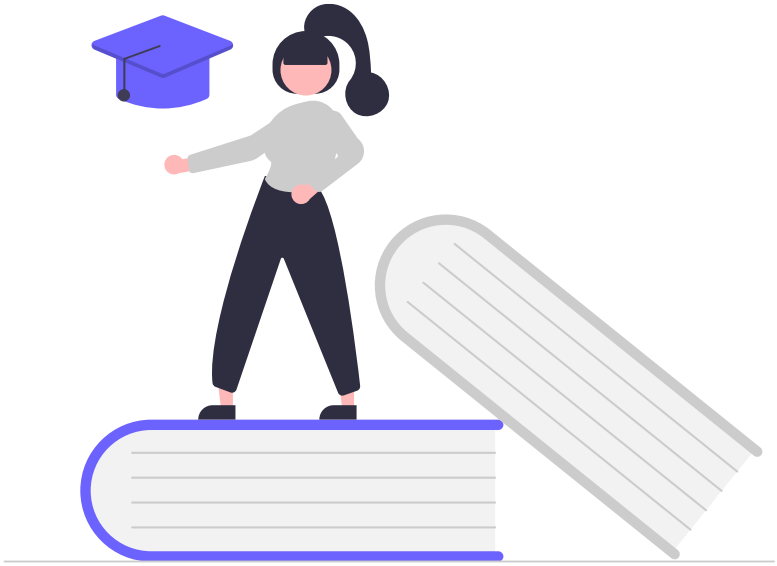

The Future of University Decision Making with Machine Learning

Project Documentation

Iyappan M – Team Leader

Jothilingam L – Team Member 1

Kabilan A – Team Member 2

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1. INTRODUCTION

1.1 Project Overview

We are currently students aiming for future studies, and we wanted to know the odds of getting admission in a university according to our scores before applying. It takes input from the user, namely, their GRE score, TOFEL score, current CGPA, SOP, LOP, and university rating and it outputs the result according to the trained Machine Learning model. In this hands-on guided project, we will train regression models to find the probability of a student getting accepted into a particular university based on their profile. This project could be practically used to get the university acceptance rate for individual students using web application and to understand regression and classification problems

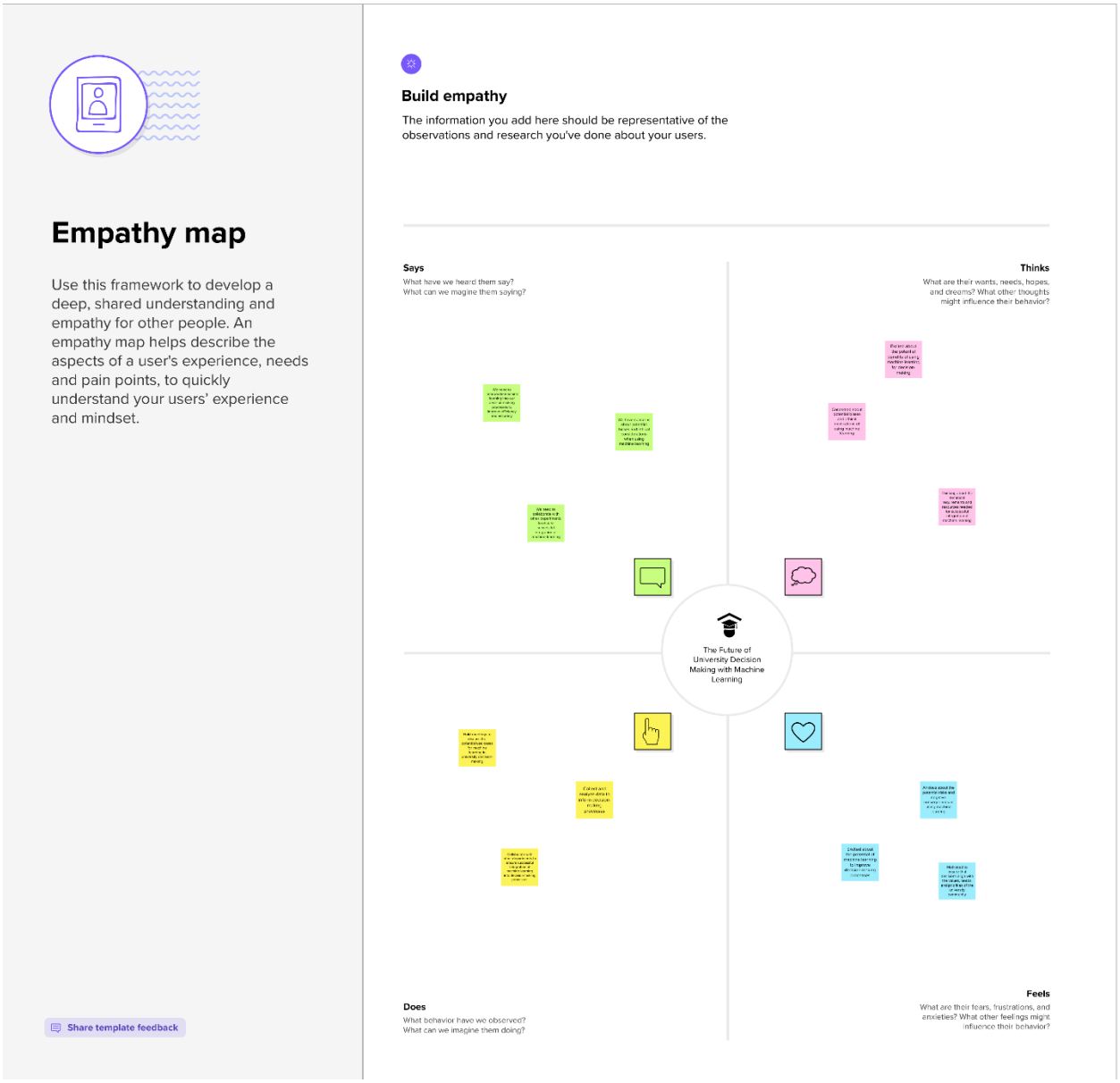
- To grab insights from data through visualization.
- Applying different ML algorithms to determine the probability of acceptance in a particular university.
- Evaluation metrics
- Build a web application using the Flask framework.

1.2 Purpose

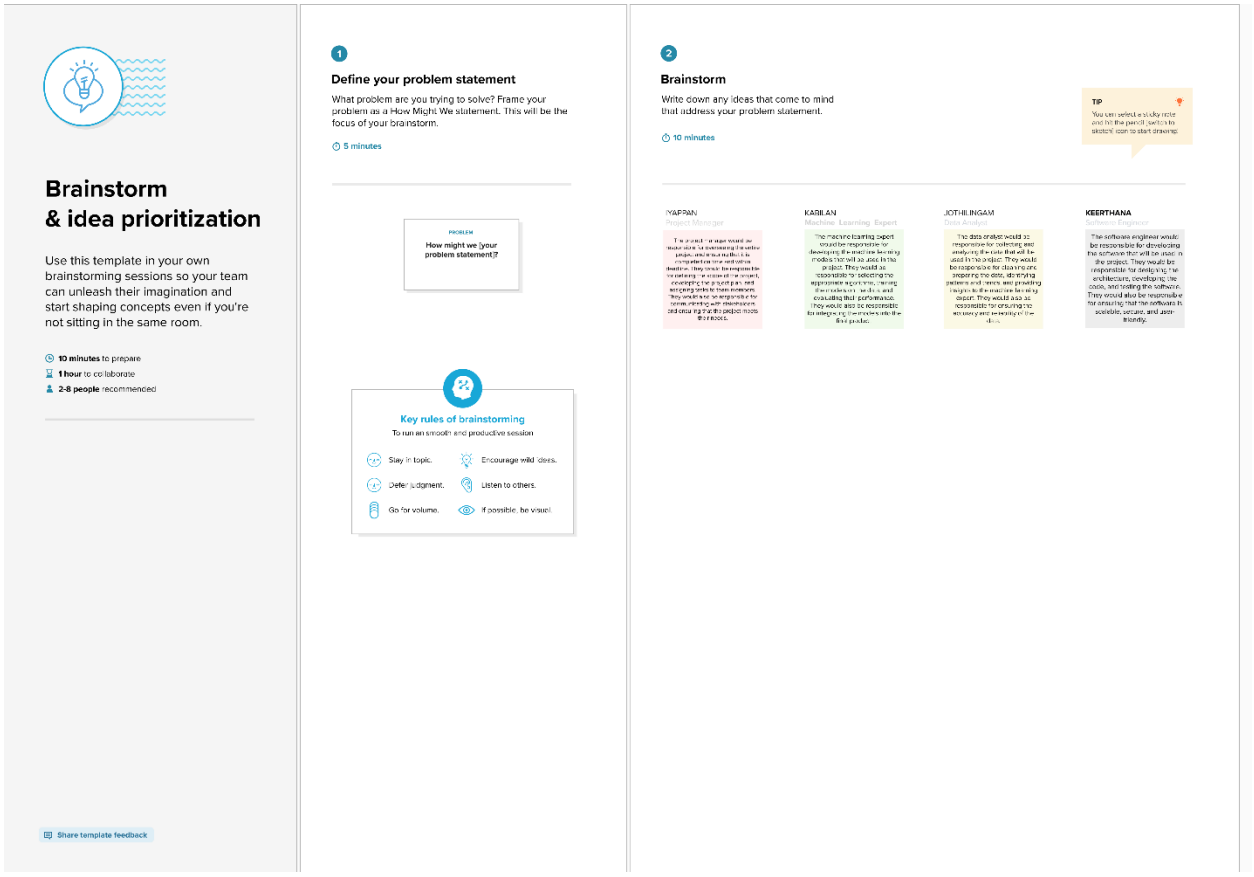
- Students are often worried about their chances of admission to university.
- The aim of this project is to help students in shortlisting universities with their profiles.
- The predicted output gives them a fair idea about their admission chances to a particular university.
- This analysis should also help students who are currently preparing or will be preparing to get a better idea.

2. Problem Definition & Design Thinking

2.1 Empathy Map



2.2 Ideation & Brainstorming Map



Brainstorm
& idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

10 minutes to prepare
1 hour to collaborate
2-8 people recommended

Share template feedback

1
Define your problem statement
What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.
5 minutes

PROBLEM
How might we [your problem statement]?

Key rules of brainstorming
To run an smooth and productive session
Stay in topic.
Encourage wild ideas.
Defer judgment.
Listen to others.
Go for volume.
If possible, be visual.

2
Brainstorm
Write down any ideas that come to mind that address your problem statement.
10 minutes

TIP
You can select a sticky note and hit the pencil [switch] to sketch. Icon to start drawing.

YAPPAN
Project Manager

KABILAN
Machine Learning Expert

JOTHILINGAM
Data Analyst

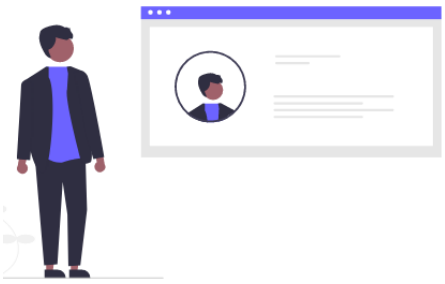
KEERTHANA
Software Engineer

3. Result

University Admission Predication

Get Started

3.1 Input & Result for Chance



Please Enter Your Details

Iyappan M

300

100

University Rating

1 2 3 4 5

8

7

8

Research

Reserch No Reserch

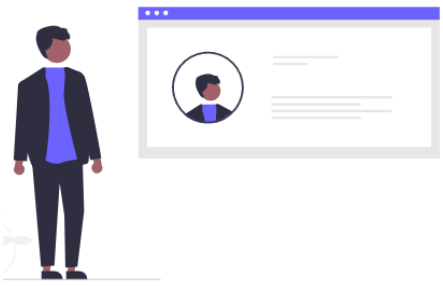
Predict

Congrats, Iyappan M

You have a chance

Return Home >

3.2 Input & Result for No Chance



Please Enter Your Details

Iyappan M

200

100

University Rating

1 2 3 4 5

5

7

3

Research

Reserch No Reserch

Predict

4. Advantages

- Improved accuracy: Machine learning algorithms can process large amounts of data quickly and accurately, making them well-suited for tasks such as predicting student performance or identifying potential research opportunities.

- Efficiency: By automating certain decision-making processes, universities can save time and resources that can be allocated to other important tasks.

- Personalization: Machine learning algorithms can help universities tailor their services and programs to individual students' needs and preferences, leading to a more personalized educational experience.

- Data-driven decision-making: Machine learning algorithms can help universities make decisions based on objective data, rather than relying on subjective opinions or biases.

- Continuous improvement: Machine learning algorithms can learn and improve over time as they process more data, leading to increasingly accurate and effective decision-making.

- Better resource allocation: By analyzing data on student performance and needs, machine learning algorithms can help universities allocate resources more effectively, such as providing additional support to struggling students or identifying areas where additional research funding may be needed.

5. Disadvantages

- Bias: Machine learning algorithms are only as unbiased as the data they are trained on. If the data used to train the algorithm is biased or incomplete, this could lead to biased decision-making.

- Lack of transparency: Machine learning algorithms can be complex and difficult to interpret, making it challenging to understand how certain decisions are being made. This can make it difficult to explain decisions to stakeholders or hold decision-makers accountable.

- Limited human involvement: Relying too heavily on machine learning algorithms could lead to reduced human involvement in decision-making processes, which could have negative impacts on transparency and accountability.

- Privacy concerns: Using machine learning algorithms to process sensitive personal information can raise privacy concerns, particularly if the algorithms are not properly secured or if the data is mishandled.

- Cost: Developing and implementing machine learning algorithms can be expensive, requiring specialized expertise and significant computing resources.

- Technical limitations: Machine learning algorithms may not be well-suited for certain types of decision-making tasks, such as those that involve complex ethical or social considerations.

- Unintended consequences: The use of machine learning algorithms could lead to unintended consequences, such as reinforcing existing biases or creating new ethical dilemmas.

6. Applications

This project can be useful for various stakeholders involved in higher education, including university administrators, policymakers, and researchers. Specifically, the insights and information provided in this project can be used to:

- Inform university decision-makers about the potential benefits and challenges of using machine learning in various aspects of university operations, such as admissions, enrollment, curriculum development, and student support.
- Help policymakers better understand the implications of machine learning for higher education and develop policies and regulations that promote ethical and responsible use of the technology.
- Provide researchers with a foundation for exploring the impact of machine learning on higher education and developing new applications for the technology.
- Serve as a resource for students and educators interested in understanding how machine learning is changing the landscape of higher education and what opportunities and challenges this presents.

7. Conclusion

In conclusion, machine learning has the potential to revolutionize decision-making in universities, providing a range of benefits such as improved accuracy, efficiency, personalization, and data-driven decision-making. However, there are also several significant disadvantages to consider, including issues of bias, lack of transparency, limited human involvement, privacy concerns, cost, technical limitations, and unintended consequences.

To ensure that machine learning is used in an ethical and effective manner, universities should carefully consider these disadvantages and implement appropriate safeguards and oversight mechanisms. This might include, for example, ensuring that algorithms are trained on unbiased and representative data, providing transparency around decision-making processes, involving human decision-makers in key decisions, and prioritizing privacy and security in data handling.

Ultimately, machine learning is not a panacea, and universities must carefully consider the potential risks and benefits of using this technology in their decision-making processes. By taking a thoughtful and cautious approach, universities can harness the power of machine learning to improve outcomes for students, faculty, and staff, while also ensuring that ethical and transparency standards are maintained.

8. Future Scope

- Explainable AI: As machine learning algorithms become more complex, there is a growing need for explainable AI, which can help stakeholders understand how decisions are being made. Future research could focus on developing more transparent and

interpretable algorithms that can provide clear explanations for their decisions.

- Personalization: As the demand for personalized education continues to grow, machine learning algorithms could be used to provide more tailored support and guidance to individual students. Future research could explore how machine learning can be used to identify and address specific student needs, such as identifying early warning signs for academic struggles or recommending courses and extracurricular activities based on student interests.

- Ethics and bias: As the use of machine learning becomes more widespread, it is essential to ensure that the algorithms are used in an ethical and unbiased manner. Future research could explore ways to reduce bias in data and algorithms and ensure that machine learning is used in a way that is fair and transparent.

- Collaboration: Machine learning can facilitate collaboration between different stakeholders in the university community, such as faculty, students, and administrators. Future research could explore how machine learning can be used to support collaborative decision-making processes and promote a culture of transparency and accountability.

- Automation: As universities continue to face budget constraints and resource limitations, machine learning could be used to automate certain tasks and processes, such as grading or scheduling. Future research could explore the potential benefits and challenges of using machine learning for automation in universities.

Appendix

app.py

```
import numpy as np
from flask import *
import pickle
from tensorflow.keras.models import load_model
from jinja2 import Environment, FileSystemLoader

env =
Environment(loader=FileSystemLoader("D:\\Pyenv\\Submit\\University_Admission_Pred
ication\\Flask\\templates"))

app = Flask(__name__)

model =
pickle.load(open("D:\\Pyenv\\Submit\\University_Admission_Predication\\Training\\
university.pkl", "rb"))

@app.route('/')
def index():
    template = env.get_template('home.html')
    return render_template(template)

@app.route('/details')
def home():
    template = env.get_template('details.html')
    return render_template(template)

@app.route("/predict", methods = ["POST","GET"])
def predict():
    min1 = [290.0, 92.0, 1.0, 1.0, 1.0, 6.8, 1]
    max1 = [340.0, 120.0, 5.0, 5.0, 5.0, 9.92, 2]

    values_list = list(request.form.values())
    fname = values_list[0]
    req_values = values_list[1:8]

    k = [float(x) for x in req_values]
    print(k)
    p = []
```

```
    for i in range(7):
        l = (k[i]-min1[i])/(max1[i]-min1[i])
        p.append(l)
    prediction = model.predict([p])
    print(prediction)
    output = prediction[0]
    if output== False:
        template = env.get_template('noChance.html')
        return render_template(template, name=fname)
    else:
        template = env.get_template('chance.html')
        return render_template(template, name=fname)

if __name__ == "__main__":
    app.run(debug=True)
```

chance.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>University Admission Predication</title>
    <link rel="stylesheet" href="../static/css/chance.css">
    <link rel="shortcut icon" href="../static/img/favicon.ico" type="image/x-
icon">
</head>
<body>
    <div class="content">
        <div>
            <img src="../static/img/partying.svg" alt="Result">
        </div>
        <div class="data">
            <h1>Congrats,  <span class="uname">{{name}}</span> </h1>
            <h2 class="result">You have a chance</h2><br>
            <a href="/" class="btn">Return Home ></a>
        </div>
    </div>
</body>
</html>
```

nochance.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>University Admission Predication</title>
    <link rel="stylesheet" href="../static/css/chance.css">
    <link rel="shortcut icon" href="../static/img/favicon.ico" type="image/x-
icon">
</head>

<style>
</style>
<body>
    <div class="content">
        <div>
            <img src="../static/img/fail.svg" alt="Result">
        </div>
        <div class="data">
            <h1>Sorry,  <span class="uname">{{name}}</span> </h1>
            <h2 class="result">You have No chance</h2><br>
            <a href="/" class="btn">Return Home ></a>
        </div>
    </div>
</body>
</html>
```