CSE/ECE 343: Machine Learning Project Proposal
Student's Adaptability Level in Online Learning Classifier

1. Motivation: Since the introduction of the Covid-19 pandemic, the focus on online learning has increased tremendously. Hence, the level of adaptability of online learning in students is of great concern. Thus, creating a classifier which analyzes various parameters pertaining to a student and reflects how these constraints depict the level of adaptability in online learning.

Since all our team members started their college journey in virtual mode and have been part of online learning for two years, we all have faced varying amounts of difficulties depending upon the individual. So, we decided to explore how the different parameters associated with an individual affect their level of adaptability to online learning. Moreover, predicting such levels given an individual's data is of prime importance.

Modern machine learning techniques and visualization tools will help us create such an optimal model.

2. Related Work: Classifying the level of adaptability of students in online learning is a broad problem as there are several constraining features associated with it.

- As per the survey done in the Philippines in May 2020, school information, access to technological resources, study habits, living conditions, and self-assessment of capacity are barriers to online learning. [Ref: here]
- Studies claim that the level of adaptability depends on the gender of the student. Boys might have an advantage over girls solely based on their higher perceived ability, comfort, and engagement with computers. [Ref: here]
- A study concluded that older ones with more agreeableness, conscientiousness, and openness outperform younger ones with strong extraversion and neuroticism. [Ref: here]

3. Timeline: A tentative 12-weeks timeline:

Week 1-2 : Data Collection & Literature review.
Week 3 : Pre-processing on data (Data extraction & Visualization and validation)
Week 4 : Feature extraction, analysis, selection
Week 5 : Feature correlation, HeatMaps, ConfusionMatrix

Week 6-8 : Implementing different models
Week 9 : Analyzing performance of models
Week 10 : Hyperparameter Tuning, model overfitting and underfitting determination
Week 11 : Compile facts and make inferences
Week 12 : Report Writing

4. Individual Tasks

Tasks	Team Member/s
Data Collection	Aditya, Vaibhav
Pre-processing (Data extraction & visualization and validation)	Harshit, Vasu
Feature Extraction and analysis	Harshit, Aditya
Logistic regression, SVM, Naive Bayes	Aditya, Vaibhav
Decision Trees, Random Forests	Harshit, Vasu
K-nearest neighbours	Vasu
Hyper-parameter Tuning, model overfitting and underfitting determination	Aditya, Vaibhav
Facts compilation, Inferences, Report Writing	Harshit, Vaibhav, Aditya

5. Final Outcome: We want to have the best predictions by our ML model on the level of acceptability of online learning & make the best out of it using various ML techniques. We want to use this idea as an indicator of the student's adaptability level so that the quality of learning can be upgraded if required by changing the key features determining such a level to help students achieve quality learning.