BUILD A STUDENT INTERVENTION SYSTEM

AS EDUCATION HAS GROWN TO RELY MORE AND MORE ON TECHNOLOGY, MORE AND MORE DATA IS AVAILABLE FOR EXAMINATION AND PREDICTION. LOGS OF STUDENT ACTIVITIES, GRADES, INTERACTIONS WITH TEACHERS AND FELLOW STUDENTS, AND MORE ARE NOW CAPTURED THROUGH LEARNING MANAGEMENT SYSTEMS LIKE CANVAS AND EDMODO AND AVAILABLE IN REAL TIME. THIS IS ESPECIALLY TRUE FOR ONLINE CLASSROOMS, WHICH ARE BECOMING MORE AND MORE POPULAR EVEN AT THE MIDDLE AND HIGH SCHOOL LEVELS.

WITHIN ALL LEVELS OF EDUCATION, THERE EXISTS A PUSH TO HELP INCREASE THE LIKELIHOOD OF STUDENT SUCCESS WITHOUT WATERING DOWN THE EDUCATION OR ENGAGING IN BEHAVIORS THAT RAISE THE LIKELIHOOD OF PASSING METRICS WITHOUT IMPROVING THE ACTUAL UNDERLYING LEARNING. GRADUATION RATES ARE OFTEN THE CRITERIA OF CHOICE FOR THIS, AND EDUCATORS AND ADMINISTRATORS ARE AFTER NEW WAYS TO PREDICT SUCCESS AND FAILURE EARLY ENOUGH TO STAGE EFFECTIVE INTERVENTIONS, AS WELL AS TO IDENTIFY THE EFFECTIVENESS OF DIFFERENT INTERVENTIONS.

TOWARD THAT END, YOUR GOAL AS A SOFTWARE ENGINEER HIRED BY THE LOCAL SCHOOL DISTRICT IS TO MODEL THE FACTORS THAT PREDICT HOW LIKELY A STUDENT IS TO PASS THEIR HIGH SCHOOL FINAL EXAM. THE SCHOOL DISTRICT HAS A GOAL TO REACH A 95% GRADUATION RATE BY THE END OF THE DECADE BY IDENTIFYING STUDENTS WHO NEED INTERVENTION BEFORE THEY DROP OUT OF SCHOOL. YOU BEING A CLEVER ENGINEER DECIDE TO IMPLEMENT A STUDENT INTERVENTION SYSTEM USING CONCEPTS YOU LEARNED FROM SUPERVISED MACHINE LEARNING. INSTEAD OF BUYING EXPENSIVE SERVERS OR IMPLEMENTING NEW DATA MODELS FROM THE GROUND UP, YOU REACH OUT TO A 3RD PARTY COMPANY WHO CAN PROVIDE YOU THE NECESSARY SOFTWARE LIBRARIES AND SERVERS TO RUN YOUR SOFTWARE.

HOWEVER, WITH LIMITED RESOURCES AND BUDGETS, THE BOARD OF SUPERVISORS WANTS YOU TO FIND THE MOST EFFECTIVE MODEL WITH THE LEAST AMOUNT OF COMPUTATION COSTS (YOU PAY THE COMPANY BY THE MEMORY AND CPU TIME YOU USE ON THEIR SERVERS). IN ORDER TO BUILD THE INTERVENTION SOFTWARE, YOU FIRST WILL NEED TO ANALYZE THE DATASET ON STUDENTS' PERFORMANCE. YOUR GOAL IS TO CHOOSE AND DEVELOP A MODEL THAT WILL PREDICT THE LIKELIHOOD THAT A GIVEN STUDENT WILL PASS, THUS HELPING DIAGNOSE WHETHER OR NOT AN INTERVENTION IS NECESSARY. YOUR MODEL MUST BE DEVELOPED BASED ON A SUBSET OF THE DATA THAT WE PROVIDE TO YOU, AND IT WILL BE TESTED AGAINST A SUBSET OF THE DATA THAT IS KEPT HIDDEN FROM THE LEARNING ALGORITHM, IN ORDER TO TEST THE MODEL'S EFFECTIVENESS ON DATA OUTSIDE THE TRAINING SET.