

Machine Learning Problem Identification and Types			
Domain	Problems	Difficulty Level (Easy-Medium-Hard)	Type
Healthcare	Mental Health Monitoring: Extensive Analysis and case studies from psychological evaluations can serve as data that can be used to map a mixture of symptoms and descriptions to mental state. A simple example: Sad, anxious, empty can be mapped to Depression. (Difficult to solve)	Hard: Data collection and formatting for the ML algorithm is easy, however it will be difficult to achieve high accuracy because mental health can be a case to case situation and will most likely require a vast and unique data set to build a 'smart' machine.	Classification
Healthcare	Early Disease/Condition Diagnosis: Using medical data from a disease such as description and symptoms can be used to build an accurate machine for early diagnosis to increase chances of prevention. (Difficult to solve)	Hard: This ML problem can vary for every case depending on the complexity of the condition. For Example: Cancer detection can be a very difficult task since early detection data is probably small in quantity and accuracy.	Classification
Education	Career/Course Selection: Many young students can be confused on their educational path and future. Using a student's performance history in a multitude of courses and character traits, a ML algorithm can be built to recommend future courses and career paths. (Can be solved)	Easy: All schools already have student performance data recorded and can also perform trait evaluations through the inspection of teachers. It is also fairly easy to find a correlation between career paths and performance/ traits. Ex: Strong math and english, confident and outgoing: may be recommended to business courses/career.	Cluster (cluster similar individual/career performances and traits into groups)
Education	Accommodative Learning System: For students looking to improve in a subject such as math, an adaptive online system can be created that follows a teaching and testing regiment which will adapt the levels and difficulty based on every answer given. (Can be solved)	Easy: It can follow a simple check to see if a certain difficulty of questions are being successfully completed before moving on to the next level.	Reinforcement
Banking	Personalized Credit Limit: Usually credit limits are adjusted on request or if a credit score / financial situation improves. This process can be automated with an optimized credit score based on financial profile and credit history (using data from other cases). (Can be solved)	Easy: Banks will have an abundance of data that can be used for the training of an algorithm.	Regression
Banking	Dynamically Optimize Interest rate for Loans or Mortgages: Interest rate can be a deterring factor in terms of attracting	Medium: Even with the data available the difficulty will be in terms of finding a balance	Regression

	borrowers. A machine can be built to find an Interest rate that is optimal based on previous borrowers that will keep attraction high.	between attracting borrowers vs managing risk.	
E-Commerce	Personalized Product Recommendation: Widely utilized based on things such as browsing history, but can also be created for local trends for product browsing. Ex: finding data that supports higher fishing rod sales near a lake area, thus giving more fishing rod recommendations in the lake area. (Can be solved)	Hard: Collecting data and trends from locations on products may be very difficult. Therefore it will be difficult to create an adaptable machine.	Clustering (clustering based on location, age, product, history etc.)
E-Commerce	Countering Diminishing Customer Engagement: Customer activity and purchase decline can correlate with cancellation and an overall high risk customer. Inspecting features such as activity, purchases, and browsing can help prevent loss of a customer through personalized offers, promotions or engagement. Ex: detecting low netflix activity, therefore sending promotions or show recommendations to prevent cancellation. (Can be solved)	Easy: Few number of features to examine, which are clear cut in terms of their relationship with customer engagement.	Classification
Gaming	In Game Enemy movement: Having games with intelligent enemies can make that game more challenging therefore making it more fun. The enemies will react based on a certain move that the user makes. (Can be solved)	Hard: It is very difficult to create an in game enemy for new generation games that should be able to react to a hundred different possible moves. Let alone creating multiple unique enemies with their own moveset. It is very difficult to make an in-game enemy seem intelligent and hiding its patterns.	Reinforcement
Gaming	Dynamic Gaming Style Adjustment: A new genre of gaming in this generation is choice based gaming. To achieve progress in this genre, games can adapt from simple text choices to gameplay style choices. Examining a user's gameplay choices within an environment to decide the type of gameplay moving forward in the game. Ex: if a user makes stealthy moves and completes missions with stealth, provide a continued stealth approach rather than a more guns blazing style. (Can be solved)	Medium: Clustering a multitude of choices with a certain game style or choice can be medium difficulty because of the varying amount of choices and styles and the complexity of the game.	Classification (In terms of stealth vs non stealth, for many choices may be cluster)