TOP PREDICTION ALGORITHMS

TYPE	NAME	DESCRIPTION	ADVANTAGES	DISADVANTAGES
Linear	 Linear regression	**The "best fit" line** through all data points. Predictions are numerical.	Easy to understand -- you clearly see what the biggest drivers of the model are.	X **Sometimes too simple to capture complex relationships between variables.** X **Does poorly with correlated features.**
Linear	 Logistic regression	The adaptation of **linear regression** to problems of classification (e.g., yes/no questions, groups, etc.)	Also easy to understand.	X **Sometimes too simple to capture complex relationships between variables.** X **Does poorly with correlated features.**
Tree-based	 Decision tree	**A series of yes/no rules based on the features,** forming a tree, to match all possible outcomes of a decision.	Easy to understand.	X **Not often used on its own for prediction because it's also often too simple and not powerful enough for complex data.**
Tree-based	 Random Forest	Takes advantage of many decision trees, with rules created from subsamples of features. Each tree is weaker than a full decision tree, but **by combining them we get better overall performance.**	A sort of "wisdom of the crowd". Tends to result in very high quality models. Fast to train.	X **Models can get very large.** X **Not easy to understand predictions.**
Tree-based	 Gradient Boosting	Uses even weaker decision trees, that are increasingly **focused on "hard" examples.**	High-performing.	X **A small change in the feature set or training set can create radical changes in the model.** X **Not easy to understand predictions.**
Neural networks	 Neural networks	Interconnected «neurons» that pass messages to each other. Deep learning uses several **layers of neural networks stacked on top of one another.**	Can handle extremely complex tasks - no other algorithm comes close in image recognition.	X **Very slow to train, because they often have a very complex architecture.** X **Almost impossible to understand predictions.**