# Glossary

***Activation Function:***Used in deep learning models to help calculate non-linear relationships.

***Actuators:***Electro-mechanical devices like motors. They help with the movement of a robot.

***AI:*** *See Artificial Intelligence.*

***AI Winter:*** *A prolonged period, such as in the 1970s and 1980s, when the AI industry came under much pressure, such as with cutbacks in funding.*

***Artificial Intelligence:*** *Where computers can learn from experience, which often involves processing data using sophisticated algorithms. Artificial intelligence is a broad category, which includes subsets like machine learning, deep learning, and Natural Language Processing (NLP).*

***Artificial Neural Network (ANN):*** *a graph-based artificial intelligence system, implementing the universal approximator idea. Although ANNs have started as a machine learning system, focusing on predictive. analytics, they have expanded over the years to include a large variety of tasks. ANNs comprise of a series of nodes called neurons, which are organized in layers. The first layer corresponds to all the inputs, the final layer to all the outputs, and the intermediary layers to a series of meta features the ANN creates, each having a corresponding weight. ANNs are stochastic in nature so every time they are trained over a set of data, the weights are noticeably different.*

***Autoencoder:*** *an artificial neural network system designed to represent coding in a very efficient manner. Autoencoders are a popular artificial intelligence system that are used for dimensionality reduction, as well as a few other unsupervised learning applications.*

***Automated Machine Learning (AutoML):*** *Google’s AI project responsible for creating an AI that designs and implements its own AI, for computer vision purposes. Automation Fatigue: With RPA, there will be less improvement as more tasks are automated.*

***Automated Machine Learning (AutoML):*** *A digital tool or platform that allows beginners to create their own AI models.*

***Backpropagation:*** *A breakthrough in deep learning. Backpropagation allows for more efficient assigning of weightings in models. Bayes’ Theorem: A statistical measure used in machine learning that helps to provide a more accurate view of the probabilities.*

***Big Data:*** *A category of technology that involves processing massive amounts of data. Big Data is often described as having the three Vs—that is, volume, variety, and velocity.*

***Binning****: Involves organizing data into groups.*

***Categorical Data****: Data that does not have a numerical meaning but instead has textual meaning, say with describing race or gender.*

***Cerebral Cortex:*** *Part of the human brain that has the most similarities to AI. It helps with thinking and other cognitive activities.*

***Chatbot:*** *An AI system that communicates with people.*

***Clustering****: a data science methodology involving finding groups in each dataset, usually using the distances among the data points as a similarity metric.*

***Cognitive computing (CC):*** *a set of processes and methods that involves self-learning systems that use data mining, pattern recognition, natural language processing and speech recognition to mimic the way the human brain works. CC can be viewed as a special kind of artificial intelligence.*

***Computational Intelligence (CI):*** *a subclass of artificial intelligence, geared towards computational problems, such as optimization.*

***Computer cluster:*** *a collection of computers sharing resources and working together, usually as a single machine. Computer clusters are extremely useful for tackling big data problems in-house, though often, are found in data centers, forming public computer clouds.*

***Computer Vision:*** *an application of artificial intelligence, where a computer can discern a variety of visual inputs and effectively “see” a lot of different real-world objects in real-time. Computer vision is an essential component of all modern robotics systems.*

***Context:*** *a characteristic of an ND Array, whereby the data is assigned to a processing unit (a GPU), to better utilize the available computing resources.*

***Crossover:*** *a process in the Genetic Algorithms framework, whereby two chromosomes merge resulting to a new pair of chromosomes, which are candidates for the next generation.*

***Cobot****: A robot that collaborates with people.*

***Cognitive Robotic Process Automation (CRPA):*** *An RPA system that leverages AI technologies.*

***Convolutional Neural Network (CNN):*** *A deep learning model that goes through different variations—or convolutions—of analysis on data. CNNs are often used for complex applications like facial recognition.*

***Data Lake:*** *Allows for the storage and processing of massive amounts of structured and unstructured data. There is often little to no need to re-format the data.*

***Data Type:*** *The kind of information a variable represents, such as a Boolean, integer, string, or floating-point number.*

***Decision Tree:*** *A machine learning algorithm that is a workflow of decision paths.*

***Deepfake:*** *Involves using deep learning models to create images or videos that are misleading or harmful.*

***Deep Learning****: A type of AI that uses neural networks, which mimic the processes of the brain. Much of the innovation in the field during the past decade has been with deep learning research.*

***Ensemble Modelling****: Involves using more than one model for generating predictions.*

***Docker:*** *a container software geared towards creating programming environments on a computer, containing all the required programs and data, so that an application can run on that computer smoothly, even if it was developed on a machine with a completely different configuration.*

***ETL (Extraction, Transformation, and Load):*** *A form of data integration that is typically used in a data warehouse.*

***Ethics Board:*** *A committee that evaluates the issues of AI projects.*

***Expert System:*** *An early type of AI application that emerged in the 1980s. It used sophisticated logic systems to help understand certain areas like medicine, finance, and manufacturing.*

***Explainability:*** *The process of understanding the underlying causes of a deep learning model.*

***Embedding:*** *a low-dimensional representation of a given set of data. Embeddings are quite common in deep learning systems, particularly in autoencoders and in representing words in Natural Language Processing tasks.*

***Epoch:*** *an iteration in the training phase of an Artificial Neural Network.*

***Error function:*** *the function used for assessing the deviation of predicted values of a machine learning model from the actual values (target variable). In artificial neural network models, the error function needs to be continuous.*

***Extreme Learning Machines (ELMs):*** *a new type of artificial neural networks that are extremely fast to train and exhibit decent performance in predictive analytics problems. Their key characteristics is that most of the connections have random weights, apart from those of the last layer (outputs), which are optimized during the training process.*

***False Positive:*** *When a model prediction shows that the result is true even though it is not.*

***Feature:*** *This is a column of data.*

***Feature Engineering:*** *See Feature Extraction.*

***Feature Extraction:*** *Describes the process of selecting the variables for an AI model.*

***Feed-Forward Neural Network:*** *A deep learning model that processes data in a linear direction through the hidden layers. There is no cycling back.*

***Feature selection:*** *the data science process according to which the dimensionality of a dataset is reduced through the selection of the most promising features and the discarding of the less promising ones. How promising a feature is depends on how well it can help predict the target variable and is related to how information-rich it is.*

***Filter:*** *a process in convolutional neural networks whereby features are created from an image by scanning it through a moving window (e.g., a 3x3 matrix).*

***Fitness function:*** *an essential part of most artificial intelligence systems, particularly optimization related ones. It depicts how close the system is getting to the desired outcome and helps it adjust its course accordingly. In most AI systems the fitness function represents an error or some form of cost, which needs to be minimized, though in the general case it can be anything and depending on the problem, it may need to be maximized.*

***Framework****: a set of tools and processes for developing a certain system, evaluating it, and deploying it. Most AI systems today are created using a framework. A framework is usually accompanied by a library/package in the programming languages it supports. In the deep learning case, for example, a framework can be a programming suite like MXNet, that enables a variety of DL related processes and classes to be utilized.*

***Fusion:*** *usually used in conjunction with feature (feature fusion), this relates to the merging of a set of features into a single meta-feature that encapsulates all, or at least most, of the information in these features. This is a popular method of dimensionality reduction, and it is an integral part of every deep learning system.*

***Fuzzy Inference System (FIS):*** *an AI system based on Fuzzy Logic, geared towards making predictions using inference rules. A FIS is quite useful particularly when interpretability is a concern. However, it is limited to lower dimensionality datasets.*

***Fuzzy Logic****: a term coined by Lotfi Aliasker Zadeh in 1965, referring to a unique way of processing information which, unlike classical logic, also involves partial truths (instead of just the conventional black-and white logical paradigm). Fuzzy logic uses degrees of truth as a mathematical model of vagueness and allows for all intermediate possibilities between digital values of YES and NO, much like how a human will assess the nature of a situation in full color and multi-polar fashion, rather than a bi-polar, monochrome way. Fuzzy logic is a well-established part of artificial intelligence.*

***Generative Adversarial Network (GAN):*** *Developed by AI researcher Ian Goodfellow, this is a next-generation deep learning model that helps to create new outputs like audio, text, or video.*

***GPUs (Graphics Processing Units):*** *Chips that were originally used for high-speed video games because of the ability to process copious amounts of data quickly. But GPUs have also proven to be adept at handling AI applications.*

***Hadoop****: Allows for managing Big Data, such as by making it possible to create sophisticated data warehouses.*

***Gene:*** *an element of a chromosome, in a Genetic Algorithms optimization model. Genes are coded as bits and they represent a characteristic, referred to as a trait.*

***Genetic Algorithms (GAs):*** *a family of optimization algorithms resembling the process of gene selection, combining, and mutation. They are well-suited for problems involving discreet variables, though they can be applied to continuous variables also. GAs is a well-established artificial intelligence methodology that finds many applications in data science, such as feature selection.*

***Genetic Programming (GP****): an artificial intelligence methodology based on genetic algorithms, but geared towards finding an optimal mathematical function, to approximate a mapping of a particular variable.*

***Genome****: the set of all the chromosome data in a Genetic Algorithms system. Genome and population are often used interchangeably in this context.*

***Hidden Layers****: The distinct levels of analysis in a deep learning model.*

***Hidden Markov Model (HMM):*** *An algorithm that is used to decipher spoken words.*

***Hyperparameters****: Features in a model that cannot be learned directly from the training process.*

***HDFS****: abbreviation for Hadoop Distributed File System, a framework for storing and accessing data over a computer cluster, in an effective and efficient manner.*

***Heuristic:*** *an empirical metric or function that aims to provide some useful tool or insight, to facilitate a method or project of data science or artificial intelligence.*

***Hive:*** *an open-source project of Apache Foundation. It is software that facilitates reading, writing, and managing large datasets residing in distributed storage using a variant of SQL called HiveQL.*

***HiveQL:*** *query language of Hive.*

***Instance:*** *This is a row of data.*

***IDE (Integrated Development Environment):*** *a system designed for facilitating the creation and running of scripts as well as their debugging. Jupyter is a popular IDE for data science applications.*

***Interpretability****: the ability to understand a data more thoroughly model’s outputs and derive how they relate to its inputs (features). Lack of interpretability is an issue for deep learning systems.*

***Jupyter Notebook****: A web-based app that makes it easy to code in Python and R to create visualizations and import AI systems.*

***K-Means Clustering:*** *An algorithm that is effective for grouping similar unlabeled data.*

***K-Nearest Neighbor (k-NN):*** *A machine learning algorithm that classifies data based on similarities.*

***Kaggle:*** *a web site that hosts data science competitions and provides many useful datasets.*

***Keras****: is an immensely popular high level deep learning API that can run on top of TensorFlow, CNTK, and Theano.*

***Kohonen’s Maps:*** *see Self-Organizing Maps.*

***Lemmatization:*** *A process in NLP that removes affixes or prefixes to focus on finding similar root words.*

***Lidar (Light Detection and Ranging):*** *A device—which is usually at the top of an autonomous car—that shoots laser beams to measure the surroundings.*

***Linear Regression****: Shows the relationship between certain variables, which can help with predictions for machine learning systems.*

***Machine Learning:*** *Where a computer can learn and improve by processing data without having to be explicitly programmed. Machine learning is a subset of AI.*

***Metadata****: This is data about data—that is, descriptions. For example, a music file can have metadata like the size, length, date of upload, comments, genre, artist, and so on.*

***Methodology:*** *a set of methods and the theory behind those methods, for solving a particular kind of problem in a certain field. Methodologies of data science include classification, regression, etc. while for artificial intelligence, we have methodologies like deep learning, autoencoders, etc.*

***Model Maintenance:*** *the process of updating or even upgrading a data model, as new data becomes available or as the assumptions of the problem change.*

***Multi-Layer Perceptron (MLP):*** *a deep learning system that comprises of a series of layers of neurons, much like a normal ANN, but larger. It is often referred to as a feed-forward network and it is the first system in the deep learning family to have been developed. MLPs are great for various standard data science problems, such as classification and regression.*

***Mutation:*** *a process in the Genetic Algorithms framework, according to which a random gene changes its value at random, with a given probability.*

***MXNet****: a deep learning framework developed by Apache. MXNet is linked to Amazon, although it can run on any cloud computing service. Its main API is called Gluon, and it is part of the main package of MXNet. There are several such packages in different programming languages, each one an API for that language. MXNet can support more programming languages than any other AI framework.*

***Naïve Bayes Classifier****: A method of machine learning that uses Bayes’ theorem to make predictions, but the variables are independent from each other.*

***Named Entity Recognition:*** *In the NLP process, this involves identifying words that represent locations, persons, and organizations.*

***Natural Language Processing (NLP):*** *A subset of AI that deals with how computers understand and manipulate language.*

***Neural Network:*** *A sophisticated AI model that mimics the brain. Neural network has various layers that attempts to find unique patterns that involve multiple layers of analysis.*

***Normal Distribution****: A plot of data that looks like a bell and the midpoint is the mean.*

***NoSQL System:*** *A next-generation database. The information is based on a document model to allow for more flexibility with analysis as well as the handling of structured and unstructured data.*

***Ordinal Data****: A mix of numerical and categorical data, such as an Amazon.com rating for a product.*

***Overfitting:*** *Where a model is not accurate because the data is not reflective of what is being evaluated or there is a focus on the wrong features.*

***Optimization:*** *an artificial intelligence process, aimed at finding the best value of a function (usually referred to as the fitness function) given a set of restrictions. Optimization is key in all modern data science systems. Although there are deterministic optimization algorithms out there, most of the modern algorithms are stochastic.*

***Optimizer:*** *an artificial intelligence system designed to perform optimization.*

***Pearson Correlation:*** *Shows the strength of a correlation—from 1 to -1. The closer it is to 1, the more accurate the correlation.*

***Phonemes:*** *The most basic units of sound in a language.*

***Predictive Analytics****: Involves using data to make forecasts.*

***Parallelizable:*** *an attribute of many systems and algorithms, whereby distinct parts of them can be split among various CPUs or GPUs, working in parallel. This brings about a boost in performance that is often essential for AI processes. A parallelizable system is also more easily scalable.*

***Particle Swarm Optimization (PSO):*** *a fundamental optimization algorithm, with several variants. Some claim that all swarm intelligence optimizers are based on PSO, since it is the simplest optimization algorithm of this category. PSO is geared towards continuous variables, though there is a variant of it for discrete ones. PSO has a variety of applications in all sorts of problems, involving many variables (large search space).*

***Perceptron:*** *a rudimentary AI model and a fundamental component of an artificial neural network. When it comes to classification, a single perceptron can only manage quite simple problems as it fails to generalize non-linear class boundaries.*

***Personally Identifiable Information (PII):*** *information that can be used to pinpoint a particular individual, thereby violating his/her privacy. PII is an important ethical concern in data science and may not be so easy to tackle since it often relies on combinations of variables.*

***Pipeline****: also known as workflow, it is a conceptual process involving a variety of steps, each one of which can comprise of several other processes. A pipeline is essential for organizing the tasks needed to perform any complex procedure (often non-linear) and is very applicable in data science (this application is known as the data science pipeline).*

***Population:*** *the totality of the elements involved in an optimization system, involving several solutions used at the same time. In some systems it is referred to as a swarm. Alternatively, the totality of the data describing a given phenomenon. Since this is often not available to the data scientist, samples of it are used instead.*

***Possibilistic modeling:*** *a particular modelling paradigm sometimes used in artificial intelligence systems, making use of membership functions instead of probabilities, to model uncertainty in Fuzzy Logic.*

***Predictive analytics:*** *a set of methodologies of data science, related to the prediction of certain variables. It includes a variety of techniques such as classification, regression, time-series analysis, and more. Predictive analytics are a key part of data science.*

***Pruning:*** *the process of cleaning up code so that unwanted solutions can be eliminated. However, with this process, the number of decisions that can be made by machines is restricted.*

***Python:*** *a widely used object-oriented programming language, typically used for data science, as well as artificial intelligence applications geared towards data analytics.*

***PyTorch:*** *A platform, developed by Facebook, which allows for the creation of sophisticated AI models.*

***Recurrent Neural Network (RNN):*** *A deep learning model that processes prior inputs across time. A common use case is when a person types in characters in a messaging app, as the AI will predict the next word.*

***Reinforcement Learning:*** *An approach to creating an AI model where the system is rewarded for the right predictions and punished for the wrong ones.*

***Relational Database:*** *A database, whose roots go back to the 1970s, that creates relationships among tables of data and has a scripting language, called SQL.*

***Robotic Desktop Automation (RDA):*** *The RPA system collaborates with an employee to handle jobs or tasks.*

***Robotic Process Automation (RPA):*** *A category of software that automates routine and mundane tasks within an organization. It is often an initial way to implement AI.*

***Robot Operating System (ROS):*** *An open-source middleware system that manages critical parts of a robot.*

***R-squared****: Provides a way to gauge the accuracy of a regression. An R-squared ranges from 0 to 1. And the closer a model is to 1, the higher the accuracy.*

***Recurrent neural network (RNN):*** *a deep learning network which employs a non-sequential flow in the data they process, resulting in an improved analysis of complex datasets, through the modeling of the temporal aspect of the data at hand. RNNs are ideal for natural language processing applications, as well as speech analysis projects.*

***Regression:*** *an extremely popular data science methodology, under the predictive analytics umbrella. Classification aims to solve the problem of predicting the values of a continuous variable corresponding to a set of inputs, based on pre-existing knowledge of similar data, available in the training set.*

***Regressor****: a predictive analytics system geared towards regression problems.*

***Reinforcement learning:*** *a type of machine learning in which machines are “taught” to achieve their target function through a process of experimentation and reward. The machine receives positive reinforcement when its processes produce the desired result and negative reinforcement when they do not.*

***ReLU function:*** *a minimalistic transfer function used in deep learning. It is defined as f(x) = max(w\*x+b, 0) and takes values between 0 and infinity. Being computationally cheaper and sparser than other transfer functions, it is sometimes preferred when creating a deep learning network.*

***Resilient Distributed Dataset (RDD):*** *the data representation of Apache Spark that supports distributed computing.*

***Restricted Bolzmann Machine (RBM):*** *a type of artificial neural network, geared towards learning the probability distributions of a set of features, to reconstruct them using a small set of meta-features. RBMs are like autoencoders in the sense that they too are often used for dimensionality reduction, though RBMs are used in other contexts, such as predictive analytics.*

***Sentiment Analysis:*** *This is where you mine social media data and find the trends.*

***Sensor:*** *The typical sensor is a camera or a Lidar, which uses a laser scanner to create 3D images.*

***Sigmoid:*** *A common activation function for a deep learning model. It has a value that ranges from 0 to 1. What is more, the closer it is to 1, the higher the accuracy.*

***Standard Deviation****: Measures the average distance from the mean, which gives a sense of the variation in the data.*

***Stemming:*** *Describes the process of reducing a word to its root (or lemma), such as by removing affixes and suffixes.*

***Strong AI:*** *This is true AI, in which a machine can engage in human-like abilities like open-ended discussions.*

***Structured Data:*** *Data that is usually stored in a relational database or spreadsheet, as the information is in a preformatted structure (like Social Security numbers, addresses, and point of sale information).*

***Sample:*** *a limited portion of the data available, useful for building a model, and (ideally) representative of the population it belongs to.*

***Sampling:*** *the process of acquiring a sample of a population using a specialized technique. Sampling is important to be done properly, to ensure that the resulting sample is representative of the population studied. Sampling needs to be random and unbiased.*

***Scala****: a functional programming language, like Java, which is used in data science. The big data framework Spark is based on Scala.*

***Selection:*** *a process of figuring out which chromosomes get to cross over, in the Genetic Algorithms framework. Selection is a stochastic process related to the fitness of the chromosomes involved..*

***Sentiment analysis:*** *a natural language processing method involving the classification of a text into a predefined sentiment, or the figuring out of a numeric value that represents the sentiment polarity (how positive or how negative the overall sentiment is).*

***Sigmoid function****: a mathematical function of the form f(x) = 1 / (1 +exp(-(w\*x + b))). Sigmoid are used in various artificial neural networks, such as Deep Learning networks, as transfer functions. Sigmoid takes values between 0 and 1, not inclusive. This is sometimes referred to as the logistic function as it features in logistic regression.*

***Simulated Annealing (SA):*** *an optimization method in the nature inspired family of algorithms, based on the annealing process of liquids. SA is ideal for complex search spaces, and it is very robust against local optima. A classical application of SA is the Traveling Salesman Problem.*

***Softmax function****: a transfer function sometimes used in a deep learning network. It is a simpler version of the sigmoid function, where the bias parameter (b) is missing from the equation. Softmax takes values between 0 and 1, not inclusive.*

***Stochastic:*** *something that is probabilistic in nature. That is, not deterministic. Stochastic processes are common in most artificial intelligence systems and other advanced machine learning systems.*

***Strong AI:*** *an area of AI development that is working toward the goal of making AI systems that are as useful and skilled as the human mind. It is often referred to as Artificial General Intelligence (AGI).*

***Supervised learning****: a set of data science methodologies where there is a target variable that needs to be predicted. The main parts of supervised learning are classification, regression, and reinforcement learning.*

***Swarm****: a set of potential solutions, evolving through a swarm intelligence framework. In the general case of different optimization systems, a swarm is referred to as population.*

***Swarm intelligence:*** *a concept based on the idea that when individual agents come together, the interactions between them lead to the emergence of a more ‘intelligent’ collective behavior – such as a swarm of bees. Swarm intelligence is an essential part of modern optimization methods, such as particle swarm optimization and it is stochastic by nature.*

***Tagging Parts of Speech (POS):*** *In the NLP process, this involves going through text and designating each word to its proper grammatical form, say nouns, verbs, adverbs, etc. .*

***TensorFlow:*** *An open-source platform, backed by Google, which allows for the creation of sophisticated AI models.*

***Target variable:*** *the variable of a dataset that is the target of a predictive analytics system, such as a classification or a regression system.*

***Tensor Processing Unit (TPU):*** *a special type of proprietary processor designed by Google in 2016 to accelerate the training of the neural network models implemented in the TensorFlow framework.*

***Test-Data:*** *Data that a model’s accuracy is evaluated.*

***Three Laws of Robotics:*** *Based on the science fiction writings of Isaac Asimov, these laws provide the basic framework for how robots should interact with society.*

***Tokenization:*** *In the NLP process where text is parsed and segmented into various parts.*

***Topic Modelling:*** *In the NLP process, this involves looking for hidden patterns and clusters in the text.*

***Training Data****: Data that is used to create an AI algorithm.*

***True Positive:*** *When a model makes a correct prediction.*

***Turing Test:*** *Created by Alan Turing, this is a way to determine if a system has achieved true AI. The test involves a person who asks questions to two participants—one human, the other a computer. If it is not clear who is the human, then the Turing Test has been passed.*

***Testing set:*** *the part of the dataset that is used for evaluating a predictive analytics model after it has been trained and before it is deployed. The testing set usually corresponds to a small portion of the original dataset.*

***Training set****: the part of the dataset that is used for training a predictive analytics model before it is evaluated and deployed. The training set usually corresponds to the largest portion of the original dataset.*

***Trait:*** *a characteristic of a problem, expressed as a gene, in the Genetic Algorithms framework.*

***Transfer function:*** *a component of an artificial neural network, corresponding to the function applied on the output of a neuron before it is transmitted to the next layer. A typical example is the sigmoid function, though ReLU is often used in practice too. Transfer functions are sometimes referred to as activation functions.*

***Transfer learning:*** *a machine learning methodology where a model trained for a task is reused in a second task without retraining. Taking the outputs of the pre-trained model as input to another model, this methodology tries to increase the performance of the second model as well as to reduce the training time.*

***Traveling Salesman Problem (TSP):*** *a classical problem in graph analytics, whereby we opt to find the quickest path. That is, the one with the smallest overall cost in terms of time or distance, from one node of the graph to itself, after passing through all the other nodes once. TSP is one of the core problems in planning and one of the most challenging optimization problems out there.*

***Unattended Robotic Process Automation (RPA):*** *The RPA system is completely autonomous as the bot runs in the background.*

***Unstructured Data:*** *Data that does not have predefined formatting, such as images, videos, and audio files.*

***Supervised Learning:*** *An AI model that uses labeled data. This is the most common approach.*

***Unsupervised Learning:*** *Involves an AI model that uses unlabeled data. This means there will need to be deep learning systems to detect patterns.*

***Vanishing Gradient Problem:*** *Explains how the accuracy decays as a deep learning model gets larger.*

***Virtual Assistant:*** *An AI device that helps a person with his or her daily activities.*

***Variable:*** *a column in a dataset, be it in a matrix or a data frame. Variables are usually turned into features, after some data engineering is performed on them.*

***Virtual Machine (VM):*** *a collection of computing, storage resources, and software, taking the form of a computer, accessible via the Internet. VMs usually live in the cloud though there is software enabling you to create a VM on your own computer or computer cluster. Cloud-based VMs are extremely useful for AI applications.*

***Weak AI:*** *This is where AI is used for a particular use case, such as with Apple’s Siri.*

***Root node:*** *The topmost node of a decision tree that represents the entire message or decision.*

***Decision (or internal) node:*** *A node within a decision tree where the prior node branches into two or more variables.*

***Leaf (or terminal) node:*** *The leaf node is also called the external node or terminal node, which means it has no child—it is the last node in the decision tree and furthest from the root node.*

***Splitting:*** *The process of dividing a node into two or more nodes. It is the part at which the decision branches off into variables.*

***Pruning:*** *The opposite of splitting, the process of going through and reducing the tree to only the most important nodes or outcomes.*