ML4SecQuiz#1-MLBasics-31stJan2023

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As mentioned earlier in Sec 1

The false positives (or even the false negatives) predicted by the model _____.

- ◯ depend both on the quality and the quantity of the data supplied during the training
- ◯ does not depend on either quality or quantity of data data supplied during training
- ◯ depend on the quality of the data supplied during the training
- ◯ depend on the quantity of the data supplied during the training

Model performance _____ depend on how the dataset are splitted in the model building.

- ◯ is irrelevant
- ◯ does
- ◯ does not

Detecting whether an email is a spam or a ham or detecting whether a financial transaction is a fraudulent or not - each is an application of the ML task _____, that is closely related to _____.

- ◯ Class probability estimation, classification
- ◯ Clustering, classification
- ◯ Class probability estimation, clustering
- ◯ Class probability estimation, Association Rule Mining
- ◯ Other:

_____ imitates our own ability to extract patterns from known examples and use that extracted insight to engineer a repeatable outcome.

- ◯ Reinforcement learning
- ◯ Unsupervised learning
- ◯ none of these options
- ◯ Supervised learning

_____ refers to the critical process of performing **initial investigations** on data so as to discover patterns,to spot anomalies,to test hypothesis and to check assumptions with the help of summary statistics and graphical representations.

- ◯ Feature Engineering
- ◯ Exploratory Data Analysis
- ◯ Model Training
- ◯ Data gathering

SVM is an example of a _____ learning algorithm that uses the _____ to create a model that has parameters learned by the _____ data.

- instance based, training data, whole dataset
- model based, training data, training data
- instance based, whole dataset, training data
- model based, whole dataset, training data

A computer program is said to learn from experience **E** with respect to some task **T** and some performance measure **P** if its performance on **T**, as measured by **P**, improves with experience **E.** Suppose we feed a learning algorithm a lot of historical weather. data, and have it learn to predict weather. Then, a reasonable choice for P would be _____.

- The probability of it correctly predicting a future date's weather.
- The process of the algorithm examining a large amount of historical weather data.
- The weather prediction task.
- None of these.

_____ is an application of _____ ML algorithms, where, the system is capable of capturing sudden changes, which can be used as an alert mechanism to provide immediate communication about an impending disaster.

- Anomaly detection, Unsupervised
- Anomaly detection, Supervised
- Association Rule Mining, Supervised
- Signature-based detection, Un-supervised

_____ is an _____ application of ML in which the raw data are identified one or more meaningful and informative labels are attached to provide context so that an ML model can learn from it.

- ◯ Smart Data Labelling, Supervisory ML-based
- ◯ Ethical credit scoring system, Supervisory ML-based
- ◯ Smart Data Labelling, Un-Supervisory ML-based
- ◯ Ethical credit scoring system, Un-Supervisory ML-based

Consider that in an application data was collected for an ML algorithm. This data was for example of the kind as follows: Input could be anything, for example, *email messages, pictures, or sensor measurements*. Outputs were supposed to be usually *real numbers, or labels (e.g. "spam", "not_spam", "cat", "dog", "mouse", etc). In some cases, outputs are vectors (e.g., four coordinates of the rectangle around a person on the picture), sequences (e.g. ["adjective", "adjective", "noun"] for the input "big beautiful car")*, or have some other structure. Then the ML algorithm must be _____

- ◯ Decision Tree
- ◯ Principle Component Analysis
- ◯ KNN
- ◯ Basic Apriori algorithm.

_____ emphasizes the incremental process of self-learning and automatically detecting patterns through experience derived from exposure to data, whereas, _____ is a less autonomous technique of extracting hidden insight.

- ◯ Machine Learning, Artificial Intelligence
- ◯ Supervised ML, Unsupervised ML
- ◯ Machine Learning, Data Mining
- ◯ Data Mining, Machine Learning,

_____ is an application of _____ ML algorithm.

- ◯ Partitioning of a set of objects into distinct similar groups, DBSCAN
- ◯ Partitioning of a set of objects into distinct similar groups, SVM
- ◯ Detecting an email to be spam/ham, DBSCAN
- ◯ Detecting an email to be spam/ham, KMeans
- ◯ Other:

A _____ is a property of a learning algorithm, usually (but not always) having a numerical value - which influences the way the algorithm works. These are not learned by the algorithm itself from data - but have to be set by the data analyst before running the algorithm.

- ◯ hyperparameter
- ◯ testing data
- ◯ parameter
- ◯ none of these

In ML, the output of the decision model is determined by _____

- the contents of the input data rather than any pre-set rules defined by a human programmer.
- none of these
- the pre-set rules defined by a human programmer, rather than any contents of the input data
- Other:

Normally , there is a split of _____ for training and _____ for testing dataset.

- 40%, 60%
- 50%, 50%
- 80%, 20%
- 20%, 80%

_____ spans various subfields that include search and planning, reasoning and knowledge representation, perception, natural language processing (NLP), and of course _____.

- AI, machine learning
- AI, Computer Science
- Machine learning, AI
- AI, AI

Predicting how much a used car would sell for given historical data on recent used car sales in the area is an example of ML task _____

- ○ classification
- ○ clustering
- ○ regression
- ○ principal component analysis

Helping with when one is looking for a particular product online but couldn't find it through traditional search methods OR similarity matching to present present other relevant products are examples of _____ and could use _____ algorithm

- ○ Classification, SVM
- ○ Regression, LASSO/Ridge
- ○ Similarity Matching, KNN
- ○ Clustering, KMeans

Comparable to how the Industrial Revolution gave birth to an era of machines simulating physical tasks, AI is driving the development of machines _____

- ○ capable of simulating cognitive abilities.
- ○ not capable of simulating cognitive abilities.
- ○ capable of simulating unscientific abilities.
- ○ none of these

In traditional computer programming, outputs or decisions are _____, whereas machine learning (also) _____ as input to build a decision model.

- uses data, uses data
- pre-defined by the programmer, pre-defined by the programmer,
- pre-defined by the programmer, uses data
- uses data, pre-defined by the programmer,

Whereas _____ focuses on analyzing input variables to predict a new output, _____ extends to analyzing both input and output variables.

- data mining, machine learning
- machine learning, data mining

_____ adopt(s) a Bayesian approach to knowledge discovery , using probabilities of previously observed events to infer the probabilities of new events.

- Artificial Neural Network (ANN)
- Support Vector Machine (SVM)
- Decision trees.
- Linear and Logistic Regression
- All of the above

Finding the relation between the weight of the person and his/her height is an example of _____ regression whereas determine the impact of gold prices, prices of crude oil etc on the inflation OR the analysis in sectors like insurance, agriculture, finance, investing are examples of _____ regression.

- ◯ non-linear, non-linear
- ◯ non-linear, linear
- ◯ linear, linear
- ◯ linear, non-linear

_____ is an example of an ML algorithm that uses _____ of the elements in a cluster as the prototype of the cluster; to determine which cluster an element belongs to.

- ◯ K Means, prototype based clustering
- ◯ Gaussian Mixture Model, Hierarchical Clustering
- ◯ BIRCH, Density-based Clustering.
- ◯ DBSCAN, Distribution-based Clustering

_____ is an example of Probability density and mass function estimation problems and use _____ ML algorithm.

- ◯ Market Basket Analysis, DBSCAN
- ◯ Email Spam Detection, SVM
- ◯ Malware detection, BIRCH

_____ during training, infuses new data into the model that it hasn't evaluated before and provides the first test against _____ data, allowing data scientists to evaluate how well the model makes predictions based on the new data.

- ◯ Testing dataset, unseen
- ◯ Validation dataset, unseen
- ◯ Validation dataset, seen
- ◯ Training dataset, unseen
- ◯ Training dataset, seen

In _____, the output is known and it randomly trials a high number of input variables to produce a desired output.

- ◯ Data Mining
- ◯ Unsupervised Learning
- ◯ Reinforcement Learning
- ◯ None of these

Model built using just _____ gets highly biased to the dataset and may _____ the training dataset; whereas model built with _____; though performs much better than the model trained using entire dataset; (however,) when trained for long time, _____

- ◯ training dataset, underfit, training & validation data set both, does not affect the model
- ◯ training dataset, underfit, validation data set, the model gets biased.
- ◯ training dataset, overfit, validation data set, does not affect the model
- ◯ training dataset, overfit, training & validation data set both, the model gets biased.
- ◯ Other:

An _____ for banks and financial institutions is a _____ ML based application to develop credit rating for those who do not have a credit cards and hence no formal credit score.

- Smart Data Labelling, Un-Supervisory ML-based
- Ethical credit scoring system, Supervisory ML-based
- Smart Data Labelling, Supervisory ML-based
- Ethical credit scoring system, Un-Supervisory ML-based

_____ are variables that define the model learned by the learning algorithm. These are directly modified by the learning algorithm based on the training data.

- none of these
- testing data
- hyperparameter
- parameter

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