Quiz - ML Definition

Total points 32/35

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✓ Machine learning algorithms can learn from data and make predictions or *1/1 decisions based on that data



True



False

Regarding the definition of machine learning, according to Tom Mitchell, "A computer program is said to learn from _____ with respect to some _____ and some performance _____, if its _____, as measured by P, improves with experience E"



experience E; task T; measure P; performance on T



task T; experience E; performance on T; measure P;

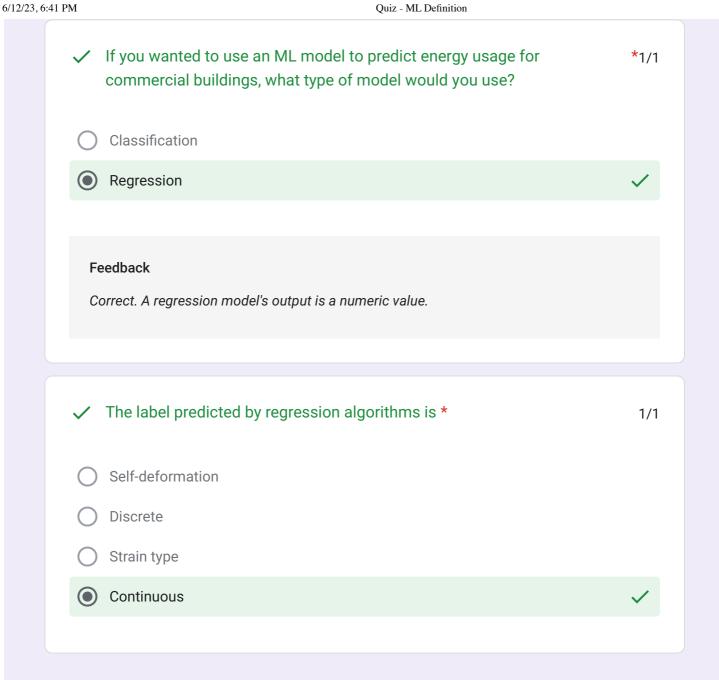


measure P; task T; experience E; performance on T;

| Select the approach that best describes each one of of the following sentences * | | | | | |
|---|------------------------|-------------|-------|----------|--|
| | Rule-based approach | ML approach | Score | | |
| Explicit programming is used to solve problems | | 0 | 1/1 | ~ | |
| Samples are used for training | 0 | • | 1/1 | ✓ | |
| Rules are manually specified | • | 0 | 1/1 | ~ | |
| Rules are automatically learned by machines | 0 | • | 1/1 | ✓ | |
| Especially useful when decision-making rules are complex | 0 | • | 1/1 | ~ | |
| | | | | | |
| ✓ Select only the true statements. * Machine Learning is great for: | | | | | |
| Problems for which existing solutions require a lot of hand-tuning or long lists of rules | | | | | |
| Sorting arrays | | | | | |
| Fluctuating environments, in which the ML system can adapt to new data | | | | | |
| Getting insights about complex problems and large amounts of data | | | | | |
| | | | | | |

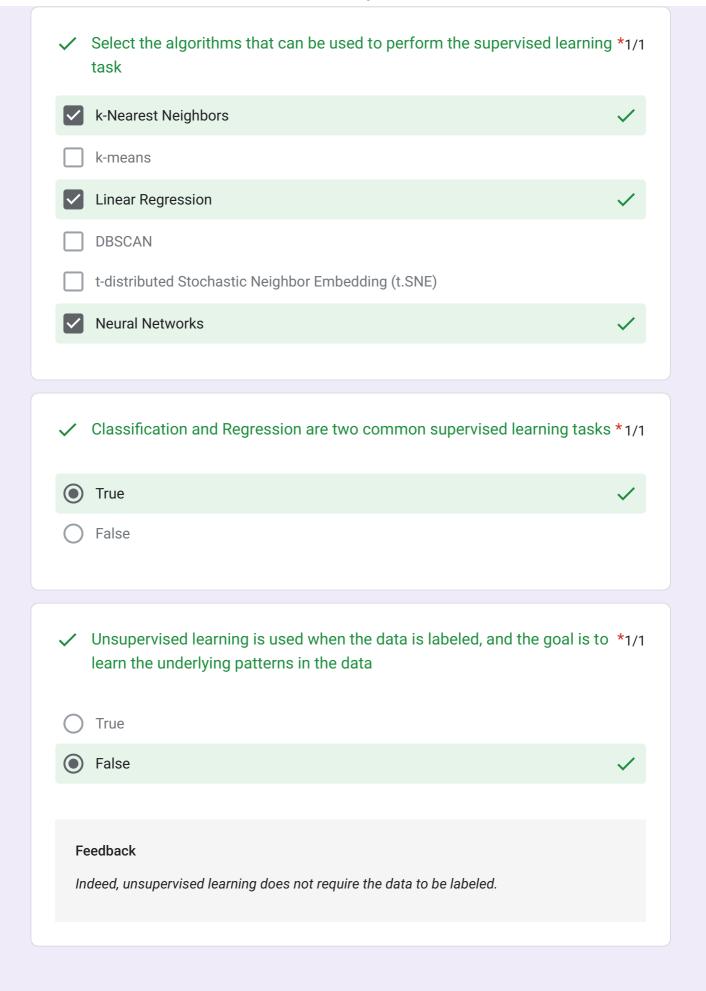
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| | Classification problems | Regression problems | Clustering problems | Score | | |
|---|-------------------------|---------------------|---------------------|----------------|-----------|--|
| The goal is to predict to which category a given input sample belongs. | | 0 | 0 | 1/1 | ✓ | |
| The goal is to group samples of a dataset based on their similarity | 0 | 0 | | 1/1 | ✓ | |
| The goal is to predict a continuous output value. It is used when the target variable is numerical. | 0 | | | 1/1 | ✓ | |
| ✓ If you wan would you | ted to use an M use | L model to pre | edict the cost | of a coach tid | cket, 1/1 | |
| Classification | | | | | | |
| Regression | 1 | | | | ✓ | |
| Feedback Correct. A regr | ession model's ou | tput is a continu | ous numeric valu | e. | | |



| Match the ML typ | e with their r | espective des | scription * | | | |
|--|------------------------|--------------------------|---------------------------------|---------------------------|-------|----------|
| | Supervised learning | Unsupervised learning | Semi- supervised learning | Reinforcement learning | Score | |
| there is no dataset and the model system learns from errors. The learning system (called agent) can observe the environment, select and perform actions, and get rewards (or penalties). Based on the reward/penalty values, the system adjust the policy (learning) to get most of the reward over time | | | | | 1/1 | ~ |
| the data is unlabeled and the system has to learn without a teacher. | 0 | | 0 | 0 | 1/1 | ~ |
| only a subset of the dataset used to train the model is labeled with the desired/expected solution | 0 | 0 | | 0 | 1/1 | ~ |
| the data used to train the model is labeled with the desired/expected solution. | • | 0 | 0 | 0 | 1/1 | ~ |
| | | | | | | |

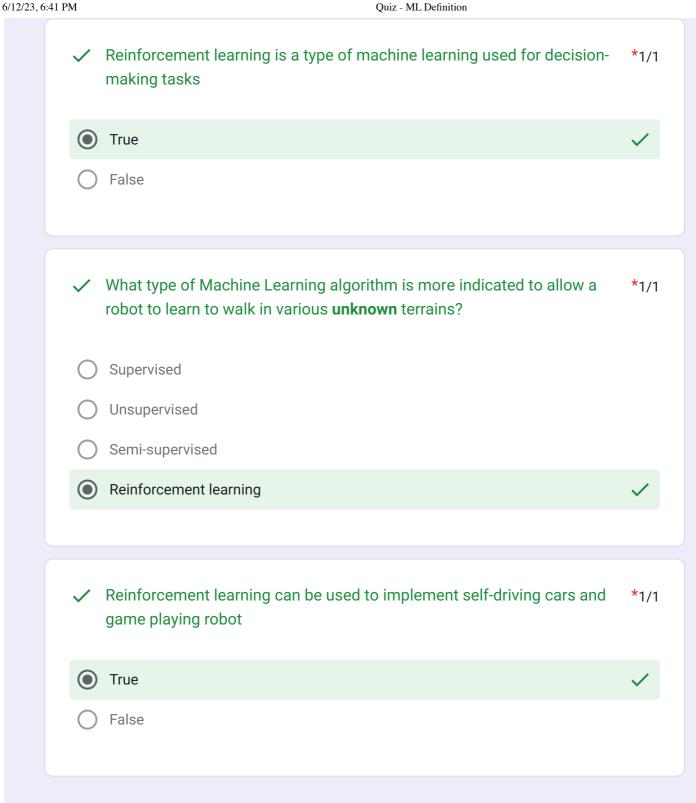
| × | Suppose you want to develop a supervised machine learning model to predict whether a given email is "spam" or "not spam." Which of the following statements are true? | *0/1 |
|------------------|---|----------|
| | Words in the subject header will make good labels. | × |
| 0 | We'll use unlabeled examples to train the model. | |
| 0 | Emails not marked as "spam" or "not spam" are unlabeled examples | |
| Cor | rect answer | |
| • | Emails not marked as "spam" or "not spam" are unlabeled examples | |
| a m b m | eedback Incorrect. Words in the subject header might make excellent features, but they won't take good labels. Incorrect. We'll use labeled examples to train the model. We can then run the trained nodel against unlabeled examples to infer whether the unlabeled email messages are parm or not spam. | |
| ~ | Select the True alternatives * | 1/1 |
| | Supervised learning can be used to solve classification tasks | ✓ |
| <u></u> | Supervised learning can be used to solve regression tasks | ✓ |
| ~ | Supervised learning requires data to be labeled with the desired/expected solution | ✓ |
| | Supervised learning does not require labeled data | |
| | | |



| ✓ Principal Component Analysis (PCA) is a technology dimensionality reduction | nique used for *1/1 |
|---|---------------------------------|
| True | ✓ |
| O False | |
| ✓ The k-means algorithm is an example of unsuclustering | pervised learning used for *1/1 |
| True | ✓ |
| ○ False | |
| Clustering is a type of unsupervised learning upoints together | used to group similar data *1/1 |
| True | ✓ |
| ○ False | |
| ✓ K-Means and Hierarchical clustering are comm | non clustering algorithms * 1/1 |
| True | ✓ |
| ○ False | |

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| ✓ | Which of the following is true about unsupervised learning? * | 1/1 |
|----------|---|----------|
| | Unsupervised algorithm only processes "features" and does not require labels | ✓ |
| | Dimensionality reduction algorithms are not classified as unsupervised learning | |
| | K-means algorithm and SVM algorithm belong lo unsupervised learning | |
| | | |
| × | Which algorithms/methods do not belong in supervised learning? * | 0/1 |
| | Logistic regression | |
| | Support Vector Machines | |
| ~ | Decision tree | × |
| | Principal component analysis | / |
| Corre | ect answer | |
| ~ | Principal component analysis | |
| | | |
| ✓ | Which of the following is the type of labels in classification tasks? * | 1/1 |
| | Discrete type | / |
| | Continuous type | |
| | Self-deformable type | |
| | Strain type | |
| | | |



| × | Select the true alternatives * 0/ | 1 |
|----------|--|---|
| | Online learning is when the system can be trained incrementally, one sample at a time or by small groups called mini-batches. | |
| <u>~</u> | Batch learning, also known as offline learning, involves training a model on a static dataset that is fixed and not updated over time | |
| | In Batch learning, the model is trained once, and then used to make predictions \checkmark without further updates. | |
| | Online learning involves training the model incrementally on a continuous stream of data, updating the model after each data point is processed. | |
| | In summary, the main difference between batch learning and online learning is the way they process data and update the model. Batch learning processes data in bulk and updates the model once, while online learning processes data incrementally and updates the model after each data point is processed. | |
| Corre | ect answer | |
| / | Online learning is when the system can be trained incrementally, one sample at a time or by small groups called mini-batches. | |
| ~ | Batch learning, also known as offline learning, involves training a model on a static dataset that is fixed and not updated over time | |
| ~ | In Batch learning, the model is trained once, and then used to make predictions without further updates. | |
| ~ | Online learning involves training the model incrementally on a continuous stream of data, updating the model after each data point is processed. | |
| ✓ | In summary, the main difference between batch learning and online learning is the way they process data and update the model. Batch learning processes data in bulk and updates the model once, while online learning processes data incrementally and updates the model after each data point is processed. | |
| ✓ | What type of learning algorithm relies on a similarity measure (i.e., *1/*comparing new data points to known data points) to make predictions? | 1 |
| • | Instance-based 🗸 | |
| 0 | Model-based | |

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