

Definitions

Supervised Learning:

- Using a large number of tasks with given outcomes to enable a computer program to improve its performance in accomplishing similar tasks

Unsupervised learning:

- Using a large number of tasks with unknown outcomes to enable a computer program to improve its performance in accomplishing similar tasks

Reinforcement learning:

- Using a large number of tasks with unknown outcomes and use of feedback to enable a computer program to improve its performance in accomplishing similar tasks

Graph:

- A graph is a collection of nodes or vertices between which there can be edges.
- Each node has a name
- An edge can have an associated label which is a numerical value

The use of graph to aid Artificial Intelligence:

- Artificial neural networks can be represented by graphs
- Graphs provide structure for relationships // graphs provide relationships between nodes
- AI problem can be defined as finding a path in a graph
- Graph may be analysed/injected by a range of algorithms
 - A* / Dijkstra's algorithm
 - used in machine learning
- Back propagation of errors / regressions

State the reasons for having multiple hidden layers in an artificial neural network

- Enable deep learning to take place

- Where the problem you are trying to solve has a higher level of complexity it requires more layers
- Allow neural network to learn and make decisions on its own
- To improve the accuracy of the result

Explain how artificial neural network enable machine learning

- Artificial neural networks are intended to replicate the way human brain work
- Weights / values are assigned for each connection between nodes
- The data are input at the input layer, then passed into the system
- They are analyzed at each subsequent hidden layer where characteristics are extracted / output are calculated
- This process of training / learning is repeated many times to achieve optimum outputs // reinforcement learning takes place
- Decisions can be made without being specifically programmed
- The output layer provides the result
- Back propagation of errors will be used to correct any errors that have been made