Machine Learning and Data Science Interview questions With Answers Q1 and Q 2

By Ali Nemati
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Alinemati1983@gmail.com

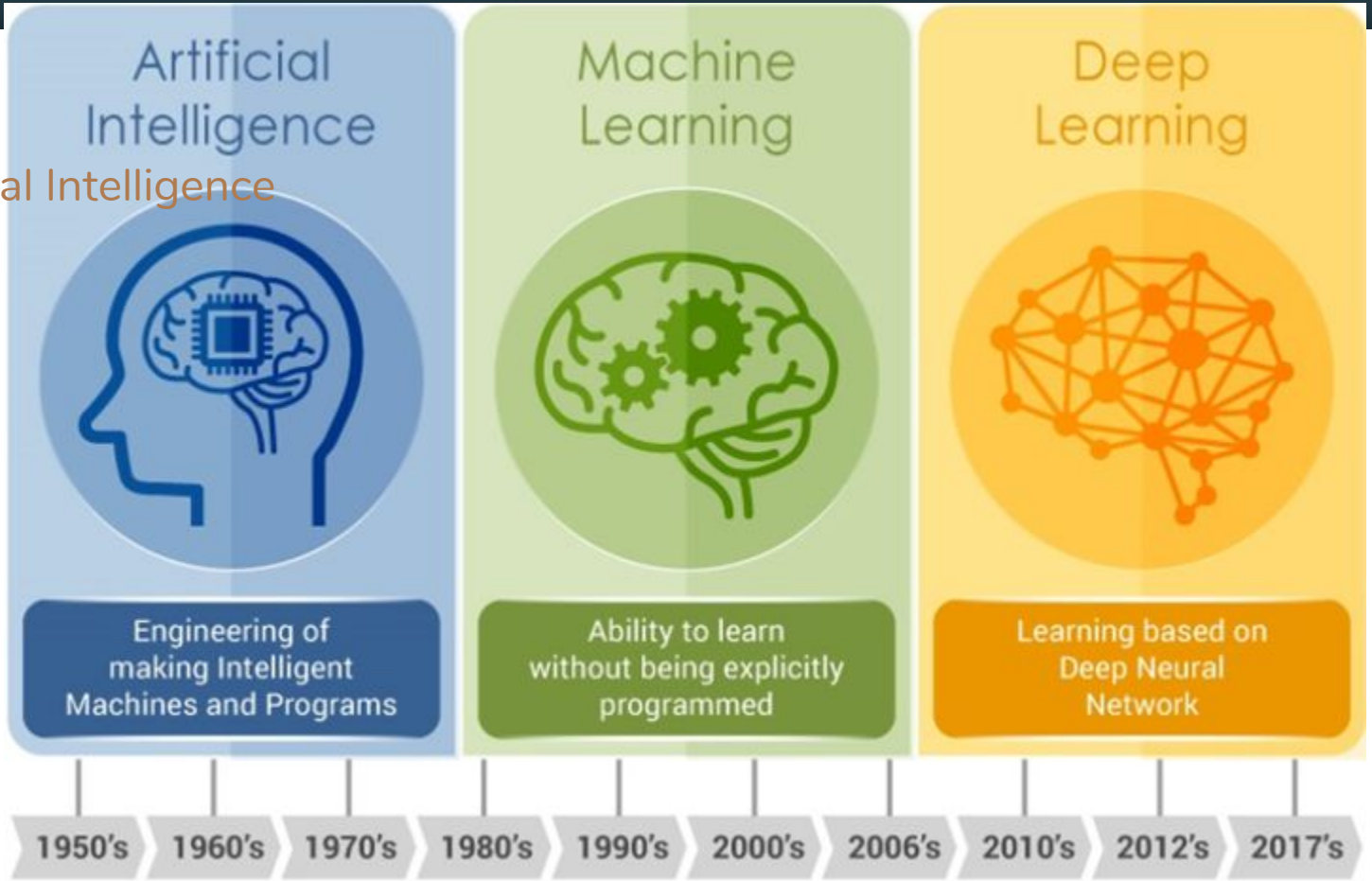
Question 1:

What is the difference between AI, DS, ML, and DL?

AI = Artificial Intelligence
ML = Machine Learning
DS = Data Science
DL = Deep Learning

Alinemati1983@gmail.com

Artificial Intelligence



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Alinemati1983@gmail.com

Artificial Intelligence

In computer science, artificial intelligence (AI), sometimes called machine intelligence, is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and animals.

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Alinemati1983@gmail.com

Some Advantages of Artificial Intelligence

- more powerful and more useful computers
- new and improved interfaces
- solving new problems
- better handling of information
- relieves information overload
- conversion of information into knowledge

The Disadvantages

- increased costs
- difficulty with software development - slow and expensive
- few experienced programmers
- few practical products have reached the market as yet.

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Alinemati1983@gmail.com

Machine Learning

Machine learning focuses on the development of computer programs that can access data and use it learn for themselves.

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The primary aim is to allow the computers learn automatically without programming. Learning pattern based on previous data.

Alinemati1983@gmail.com

Classified into:

1. Supervised
2. Unsupervised
3. semi-supervised
4. Reinforcement learning

Alinemati1983@gmail.com

Data Science

Data science has many tools, techniques, and algorithms called from these fields, plus others –to handle big data

Alinemati1983@gmail.com

Goal of Data Science:

1. Prediction (predict a value based on inputs)
2. Classification (e.g., spam or not spam)
3. Recommendations (e.g., Amazon and Netflix recommendations)
4. Pattern detection and grouping (e.g., classification without known classes)
5. Anomaly detection (e.g., fraud detection)
6. Recognition (image, text, audio, video, facial, …)
7. Actionable insights (via dashboards, reports, visualizations, …)
8. Automated processes and decision-making (e.g., credit card approval)
9. Scoring and ranking (e.g., FICO score)
10. Segmentation (e.g., demographic-based marketing)
11. Optimization (e.g., risk management)
12. Forecasts (e.g., sales and revenue)

Alinemati1983@gmail.com

Deep Learning

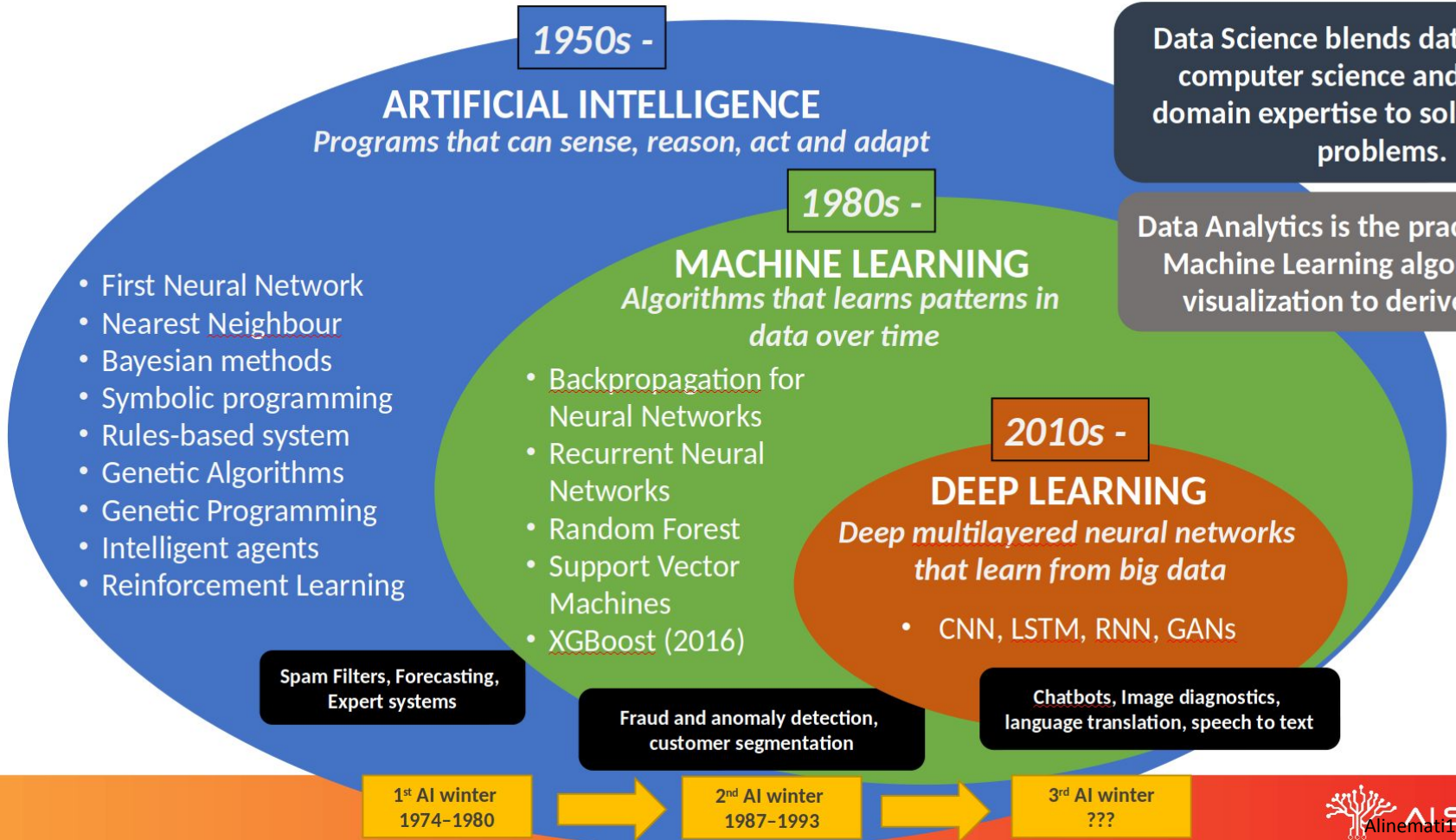
Deep learning is part of a broader family of machine learning methods based on artificial neural networks with representation learning. (Wikipedia)

Example:

- **Object Detection or classification in photographs**
- **Automatic driving cars**
- **Automatic Game Playing**
- **Automatic Machine Translation**
- **Colorization of Black & White Images**
- **Automatic Handwriting generation**

Alinemati1983@gmail.com

AI VS ML VS DATA ANALYTICS VS DATA SCIENCE



Data Science blends data analytics, computer science and business domain expertise to solve business problems.

Data Analytics is the practice of using Machine Learning algorithms and visualization to derive insights.

Question 2

What is the difference between

Supervised learning,

Unsupervised learning and

Semi-Supervised Learning

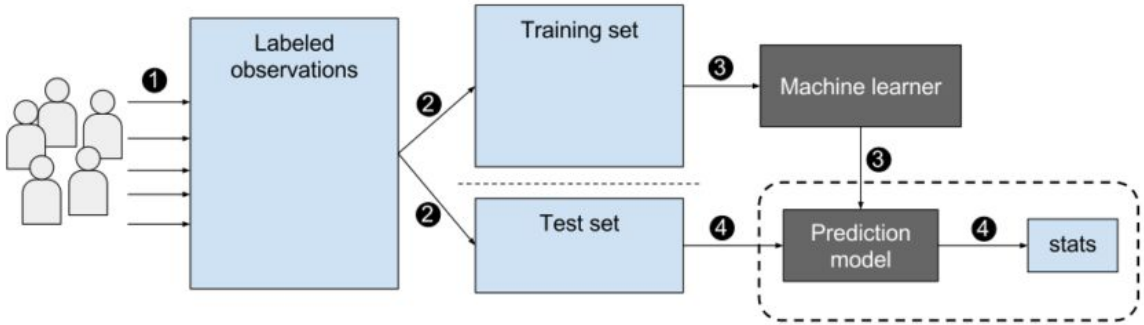
Reinforcement learning?

Alinemati1983@gmail.com

Supervised learning

In a supervised learning model, the algorithm learns on a labeled dataset, to generate reasonable predictions for the response to new data. (Forecasting outcome of new data)

- Regression
- Classification



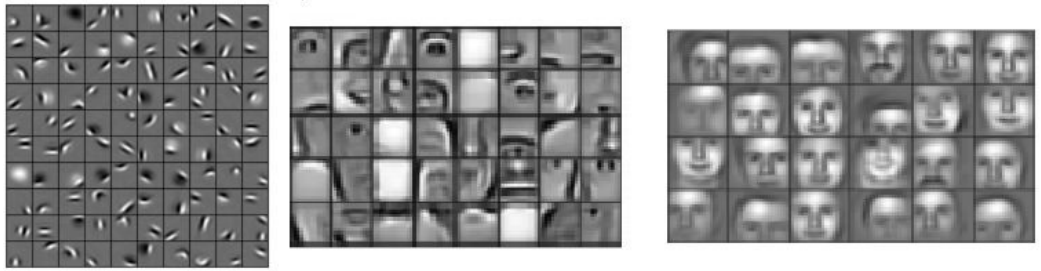
https://blogs.nvidia.com/blog/2018/08/02/supervised-unsupervised-learning/

Alinemati1983@gmail.com

Unsupervised Learning

An unsupervised model, in contrast, provides unlabelled data that the algorithm tries to make sense of by extracting features, co-occurrence and underlying patterns on its own.

Unsupervised learning models automatically extract features and find patterns in the data.



Alinemati1983@gmail.com

We use unsupervised learning for

• Clustering: the deep learning model looks for training data that are similar to each other and groups them together.

• Anomaly detection: Banks detect fraudulent transactions by looking for unusual patterns in customer's purchasing behavior. For instance, if the same credit card is used in California and Denmark within the same day, that's cause for suspicion.

• Association: By looking at a couple key attributes of a data point, an unsupervised learning model can predict the other attributes with which they're commonly associated.

• Autoencoders : Autoencoders take input data, compress it into a code, then try to recreate the input data from that summarized code.

Alinemati1983@gmail.com

What Is Semi-Supervised Learning?

A training dataset with both labeled and unlabeled data. This method is particularly useful when extracting relevant features from the data is difficult, and labeling examples is a time-intensive task for experts.

- popular training method : general adversarial networks, or GANs.

Alinemati1983@gmail.com

What Is Reinforcement Learning?

Reinforcement learning is less supervised and depends on the learning agent in determining the output solutions by arriving at different possible ways to achieve the best possible solution.

Video games are full of reinforcement cues. Complete a level and earn a badge. Defeat the bad guy in a certain number of moves and earn a bonus. Step into a trap — game over.

Alinemati1983@gmail.com

Thanks for watching

See you soon

Alinemati1983@gmail.com