EM624
Exercise 5 Part 1
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1) What is Agile Software Development?

Agile software development is a type of development methodology that anticipates the need for flexibility and applies a level of pragmatism to the delivery of the finished product. It focuses on the clean delivery of individual pieces or parts of the software and not on the entire application.

Benefits of Agile include its ability to help teams in an evolving landscape while maintaining a focus on the efficient delivery of business value. The collaborative culture facilitated by Agile also improves efficiency throughout the organization as teams work together and understand their specific roles in the process. Finally, companies using Agile software development can feel confident that they are releasing a high-quality product since testing is performed throughout development, providing the opportunity to make changes as needed and alert teams to any potential issues.

Agile has replaced waterfall as the development methodology of choice in most companies.

Why is Agile relevant?

Agile is the ability to create and respond to change. It is a way of dealing with, and ultimately succeeding in, an uncertain and turbulent environment.

Agile project management methodology is commonly used for software development projects. It has greater adaptability to frequently changing scope. As a consequence, agile project management uses iterative or phased planning and continuous integration throughout the life of the project.

2) What are the Disadvantages of waterfall?

- Unlike agile, this methodology does not allow for discovery, iteration, and refinement whilst developing the product. Instead, new requirements must be written.
- As it is static, this methodology is not suitable for projects where client or business requirements may change during development.
- Lack of flexibility for change
- Less opportunity for innovation
- It is Test compressed
- Customer only sees result at end
- Developer works from static specification, not with customer
- Time lag between design and results

3) What is Machine Learning?

Machine learning is programming computers to optimize a performance criterion using example data as past experience. Machine Learning means learning from Data

Machine Learning is just Data + Algorithms

ML is a subset of artificial intelligence (AI) is the area of computational science that focuses on analyzing and interpreting patterns and structures in data to enable learning, reasoning, and decision making outside of human interaction. The use and development of computer systems that are able to learn and adapt without following explicit instructions, by using algorithms and statistical models to analyze and draw inferences from patterns in data is Machine Learning.

What are some applications of Machine Learning?

- No human experts: industrial/manufacturing control, mass spectrometer analysis, drug design, astronomic discovery
- Black-box human expertise: face/handwriting/speech recognition, driving a car, flying a plane
- Rapidly changing phenomena : credit scoring, financial modeling, diagnosis, fraud detection
- Need for customization/personalization : personalized news reader, movie/book recommendation
- Machine learning is already making code more efficient: Google's Jeff Dean has reported that 500 lines of TensorFlow code has replaced 500,000 lines of code in Google Translate
- Machine learning can be used to generate short programs from training data; to optimize small parts of larger programs, but not the entire program
- ML is playing an increasing role in Data management and infrastructure
- Used in Cars : Self Parking, Cruise Control, Speech Recognition
- Used in Banks : Monitoring of Fraud - Whenever a customer carries out a transaction – the Machine Learning model thoroughly x-rays their profile searching for suspicious patterns. In Machine Learning, problems like fraud detection are usually framed as classification problems.
- Used in Military : Unmanned aerial and water vehicles
- Used in Apps like Uber : It uses Machine Learning algorithm layered on top of Historic Trip Data to make a more accurate ETA prediction. With the implementation of Machine Learning, they saw a 26% accuracy in Delivery and Pickup.
- Used in Google Maps for Traffic Alerts : It's a combination of People currently using the service, Historic Data of that route collected over time and few tricks acquired from other companies. Everyone using maps is providing their location, average speed, the route in which they are traveling which in turn helps Google collect massive Data about the traffic, which makes them predict the upcoming traffic and adjust your route according to it.