What is Batch learning??

- **Batch learning** models are incapable of learning incrementally.
- These models take a lot of time and computing resources because of full training data, so it is typically done offline.
- First we train the model and deploy it in production and runs without learning anymore.
- If your **Batch learning** model wants to learn new things then you need to train the model completely from scratch on full data and replace it with old model in production.
- You can still automate this process of training, evaluating , and launching a Machine Learning, so even a **Batch learning** system can adapt to changes.
- This solution is simple and often works fine, But there are few catches here like when you have large amount of data and it takes hours to train, what if your model need to adapt to rapidly changing data or you need to train these models on low powered devices.

What is Online learning??

- **Online learning** models learn incrementally by feeding it with data sequentially, either individually or by batches.
- Each learning step is fast and cheap, so the system can learn about new data on the fly, as it arrives.
- **Online learning** is good when you get data stream continuously like stock data and need to adapt to change rapidly.
- It is also good when you have limited computing resources.
- One important parameter of **online learning** systems is how fast they should adapt to changing data, this is called the learning rate.
- If you set a high learning rate, then your system will rapidly adapt to new data, but it will also tend to quickly forget the old data.
- If it is low it will learn more slowly, but it will also be less sensitive to noise in the new data.
- Drawback of **online learning** is when you get bad data, it will lead to decay in model performance. you need to monitor closely and stop learning when you see bad data.