Assignment 1:

1. **What type of Machine Learning Algorithms would be used to allow your bipedal bot to walk in various terrains?**

# Deep Reinforcement learning algorithm

## In  Boston Dynamics, they using physic of locomotion to overcome ml algorithm , by observing how animals and insects move in nature

* There have been some papers coming out of the Stanford research group , like walking algorithms

1. **What is the difference between online learning and out-of-the-core learning?**

* Both works on same method of process , making the data into mini batches then use them to train the model .
* In online learning , there will be continuous flow of data so it is complex to design the pipeline and tricky .
* In out of core learning , if there is a huge data , we can break into mini batch then we can train our model in our core memory , but can’t use for all algorithms and it is not continuous flow like online learning it will train until the batches over , but in online learning there will continuous learning and prediction.

1. **What is the importance of a train-dev set in machine learning?**

* If our model perform worst accuracy in test data , we don’t know where is problem , it is on algorithm or overfitting?
* So train-dev set used to check whether the model is data is overfitted or **Data mismatch .** if the model perform good in train-dev set then the data got mismatched , if it is not perform well then algorithm is wrong.

1. **If suppose your model is poorly generalizing the unseen data, what possibilities are there, and how you will solve those situations?**

* Reason : Overfitting , data mismatch , model complexity, data leakage
* Solution : decreasing the model complexity, Regularization, increasing the training data, decreasing the noise of training set.

5 . **What is data leakage and what can go wrong if you tune your hyperparameters on the test set?**

* **Data Leakage** is the scenario where the Machine Learning Model is already aware of some part of test data after training.This causes the problem of overfitting.
* the training process contains information about what the model is trying to predict.
* Objective of ml is to predict the unseen data , if we tune our hyperparameters in test data ,we itself giving the model to chance to see the test data , so it leads to high bias(underfitting) , it is mostly like cheating on one exam to pass but in result fails on other exams.