# Project2_Continuous_Control

Project Objective

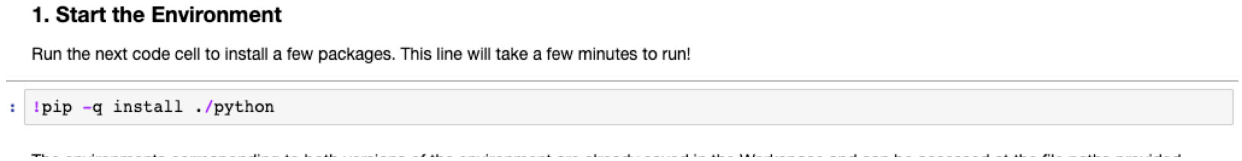
The goal of this project is to create and train a double-jointed arm agent that is able to maintain its hand in contact with a moving target for as many time steps as possible.

Environment:
This environment provided using the Unity ML-Agents. A double-jointed arm can move to target locations. A reward of +0.1 is provided for each step that the agent's hand is in the target location.

State/Action Spaces:
The observation space consists of 33 variables corresponding to position, rotation, velocity, and angular velocities of the arm.
the actiona space consists of 4 actions

Instructions to download:
Please download the github repository and use place all the files in a folder and open .ipynb file
https://github.com/sriten15/Project2_Continuous_Control

ipynb will install the python environment



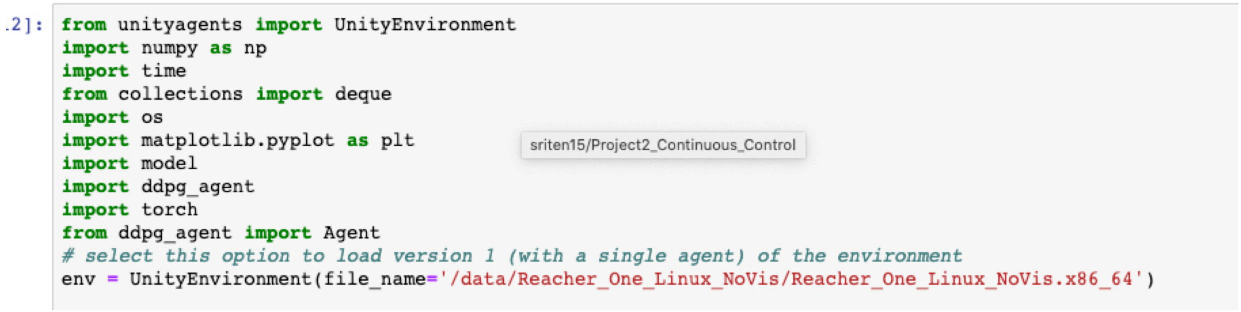
1. Start the Environment

Run the next code cell to install a few packages. This line will take a few minutes to run!

```
!pip -q install ./python
```

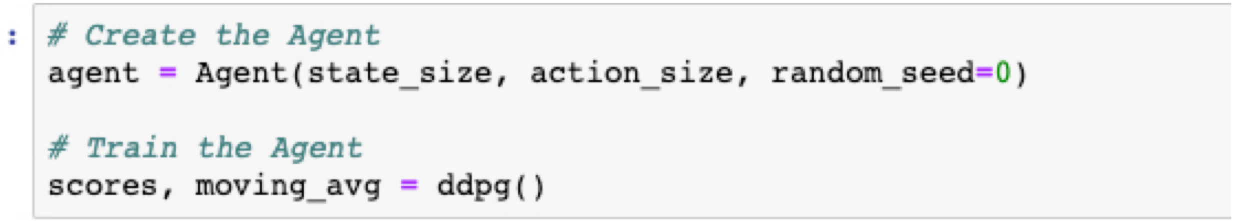
Train and Test the agent:

Firstly, we shd import the following modules,



```
from unityagents import UnityEnvironment
import numpy as np
import time
from collections import deque
import os
import matplotlib.pyplot as plt
import model
import ddpg_agent
import torch
from ddpg_agent import Agent
# select this option to load version 1 (with a single agent) of the environment
env = UnityEnvironment(file_name='/data/Reacher_One_Linux_NoVis/Reacher_One_Linux_NoVis.x86_64')
```

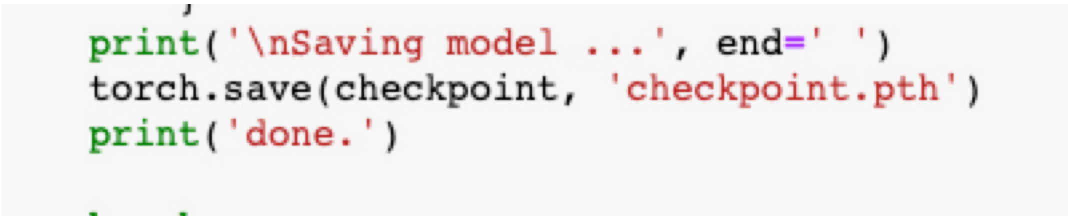
Create the agent and call the training function:



```
# Create the Agent
agent = Agent(state_size, action_size, random_seed=0)

# Train the Agent
scores, moving_avg = ddpg()
```

Checkpoints to test:
Once the agent is trained, the checkpoint.pth will hold the training parameters which can be loaded to test the agent



```
    print('\nSaving model ...', end=' ')
    torch.save(checkpoint, 'checkpoint.pth')
    print('done.')
```

Goal:

To solve the environment, one agent version , the agent is expected to achieve average score of 30+ for 100 consecutive episodes.

Github Repository Files:
Readme.md
Continuous_Control.ipynb
ddpg_agent.py
model.py
checkpoint.pth
Report.md

Since the project is executed in jupyter notebook. Please run the jupyter notebook as is to look at the agent trained in the environment.