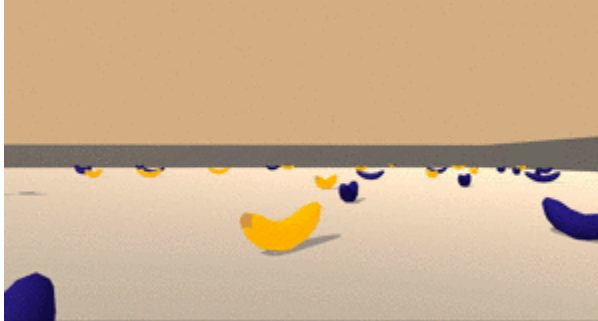


# Banana Collection Agent

This is an exercise of Deep Reinforcement Learning to try an agent to collect as many bananas on a Unity environment.

## Environment Overview



This environment is based on Unity, and has following attributes.

### Reward

- A reward of +1 is provided for collecting a yellow banana
- A reward of -1 is provided for collecting a blue banana

### State Space

- Continuous 37 dimensions and contains
  - the agent's velocity
  - ray-based perception of objects around agent's forward direction

### Action Space

- Discrete 4 actions
  - **0** - move forward.
  - **1** - move backward.
  - **2** - turn left.
  - **3** - turn right.

## Goal of the agent

- get an average score of +13
  - for 100 consecutive episodes
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# Algorithm

Used a simple deep newron network. With following acrhitecture

- Fully connected layer 1 (64) with ReLu
- Fully connected layer 2 (64) with ReLu
- Fully connected layer 3 (37)

## Performance

- Score by epoches is asbelow. The model reached to average score > 13.0 around 500 epoches.

## Ideas for Future Work

- Architecture: Currently, just used simple NN. Going forward, using more complex architecture may improve the score
  - Hyperparameter: the parameter has not been fully optimized. Here is another opportunity of improvement
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## How to Run

- The trained model is `checkpoint.pth`. You can use this on Unity environment

## Dependencies

1. Download the Unity environment from one of the links below
  - Linux: [click here](#)
  - Mac OSX: [click here](#)
  - Windows (32-bit): [click here](#)
  - Windows (64-bit): [click here](#)
2. Place the file in this repository and unzip