

# IERG 5350 Assignment 4: Advanced Algorithms for Continuous Control in RL

Welcome to assignment 4 of our RL course!

2020-2021 Term 1, IERG 5350: Reinforcement Learning. Department of Information Engineering, The Chinese University of Hong Kong. Course Instructor: Professor ZHOU Bolei.  
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In this assignment, we will implement a system of RL that allows us to train and evaluate RL agents formally and efficiently.

In this notebook, you will go through the following components of the whole system:

- Preparation: Colab, and Environment
- Section 1: Training with algorithm PPO
- Section 2: Training with algorithm DDPG
- Section 3: Training with algorithm TD3
- Section 4: Transfer your PPO/ DDPG/ TD3 to another task: Four-Solution-Maze

The author of this assignment is SUN, Hao (sh018 AT ie.cuhk.edu.hk).

## Colab

Introduction to Google Colab:

From now on, our assignment as well as the final project will be based on the Google Colab, where you can apply for free GPU resources to accelerate the learning of your RL models.

Here are some resources as intro to the Colab.

- YouTube Video: <https://www.youtube.com/watch?v=inN8seMm7UI>
- Colab Intro: <https://colab.research.google.com/notebooks/intro.ipynb> (you may need to login with your google account)

## Gym Continuous Control Tasks

Introduction to the Gym Continuous Control Environments

In the last assignment, you have already used the gym[atari] benchmarks, where the action space is discrete so that normal approach is value-based methods e.g., DQN.

In this assignment, we will try to implement three prevailing RL algorithms for continuous control tasks, namely the PPO(<https://arxiv.org/abs/1707.06347>), DDPG(<https://arxiv.org/abs/1509.02971>) and TD3(<https://arxiv.org/abs/1802.09477>).

We will now begin with a gym environment for continuous control,

The Pendulum-v0

In [52...

```
import gym
ENV_NAME = "Pendulum-v0"
env = gym.make(ENV_NAME)
state = env.reset()
print('the state space is like', state)
print('the max and min action is: ', env.action_space.high, env.action_space.low)

'''so that you may need to use action value re-size if you want to use the tanh activation functions'''
```

```
the state space is like [0.74556654 0.6664312 0.4888417 ]
the max and min action is: [2.] [-2.]
```

Out[52...

```
'so that you may need to use action value re-size if you want to use the tanh activation functions'
```

## PPO

The Proximal Policy Optimization Algorithms is the most prevailing on-policy learning method. Although its sample efficiency is not as high as the off-policy methods, the PPO is relatively easy to implement and the learning is much more stable than off-policy methods. Whenever you have a task you want to try whether RL works, you may try to run a PPO agent at first. It is worth mentioning even the most challenging game, the StarCraftII agent AlphaStar is trained based on PPO (with lots of improvements, ofcourse).

## TODOs for You

The ppo has the benefit of trust region policy optimization (TRPO) but is much simpler to implement, and with some implementation engineering, the sample complexity of TRPO is further improved.

The key idea of PPO optimization is *Not Optimize the Policy Too Much in a Certain Step*, which follows the key insight of the method of TRPO.

In TRPO, the optimization objective of policy is to learn a policy such that

$$\max_{\theta} \mathbb{E}_t \left[ \frac{\pi_{\theta}(a_t | s_t)}{\pi_{\theta_{old}}(a_t | s_t)} \hat{A}_t \right]$$

subject to

$$\hat{\mathbb{E}}_t [KL[\pi_{\theta_{old}}(\cdot | s_t), \pi_{\theta}(\cdot | s_t)]] \leq \delta$$

where  $\hat{A}$  denotes the advantage function, rather than optimize the objective function of

$$L^{PG}(\theta) = \mathbb{E}_t [\log \pi_{\theta}(a_t | s_t) \hat{A}_t]$$

in the normal policy gradient methods.

The PPO proposed two alternative approaches to solve the constrained optimization above, namely the Clipped Surrogated Objective and the Adaptive KL penalty Coefficient. The former one is more generally used in practice as it's more convenient to implement, more efficient and owns stable performance.

The Clipped Surrogated Objective approach replace the surrogate objective

$$L^{CPI}(\theta) = \hat{\mathbb{E}}_t \left[ \frac{\pi_\theta(a_t|s_t)}{\pi_{\theta_{old}}(a_t|s_t)} \hat{A}_t \right] = \hat{\mathbb{E}}_t [r_t(\theta) \hat{A}_t]$$

of TRPO (CPI: Conservative Policy Iteration) by

$$L^{CLIP}(\theta) = \hat{\mathbb{E}}_t [\min(r_t(\theta) \hat{A}_t, \text{clip}(r_t(\theta), 1 - \epsilon, 1 + \epsilon) \hat{A}_t)]$$

You can check that  $L^{CLIP}(\theta) = L^{CPI}(\theta)$  around the old policy parameter  $\theta_{old}$ , i.e., when  $r = 1$ .

## TODOs here:

In this section, your task is to finish the code of a PPO algorithm and evaluate its performance in the Pendulum-v0 environment.

Specifically, you need to

- Q1. finish building up the ActorCritic "`__init__`" function, i.e., build up the neural network.
- Q2. finish the forward function, in this part, there are two functions need to finish: the `_forward_actor` function and the `_forward_critic` function
- Q3. finish the select\_action function, which is called during interacting with the environment, so that you may need to return an action as well as the (log-)probability of getting that action for future optimization
- Q4. finish the optimization steps for your PPO agent, that means you need to build up the surrogate loss through your saved tuples in previous episodes and optimize it with current network parameters.
- Q5. finally, you may need to optimize some of the hyper-parameters to have a better task performance.

```
In [82... # You need not to rivese this unless you want to try other hyper-parameter settings
# in which case you may revise the default values of class args()
from IPython import display
import torch
import torch.nn as nn
import torch.optim as opt
from torch import Tensor
from torch.autograd import Variable
from collections import namedtuple
from itertools import count
import torch.nn.functional as F
import matplotlib.pyplot as plt
from os.path import join as join_dir
from os import makedirs as mkdir
import pandas as pd
import numpy as np
import argparse
import datetime
import math
import random

Transition = namedtuple('Transition', ('state', 'value', 'action', 'logproba', 'mask', 'next_state', 'reward'))
env = gym.make(ENV_NAME)
env.reset()

EPS = 1e-10 # you may need this tiny value somewhere, and think about why?
RESULT_DIR = 'Result_PP0'
mkdir(RESULT_DIR, exist_ok=True)
mkdir(ENV_NAME.split('.')[-1][0]+'CheckPoints', exist_ok=True)
mkdir(ENV_NAME.split('.')[-1][0]+'Rwds', exist_ok=True)
rlds = []
rlds_history = []

class args(object):
    hid_num = 256
    drop_prob = 0.1
    env_name = ENV_NAME
    seed = 1
    num_episode = 300
    batch_size = 5120
    max_step_per_round = 2000
    gamma = 0.99
    lamda = 0.95
    log_num_episode = 1
    num_epoch = 10
    minibatch_size = 512
    clip = 0.2
    loss_coeff_value = 0.5
    loss_coeff_entropy = 0.0
    lr = 3e-4
    num_parallel_run = 1
    # tricks
    schedule_adam = 'linear'
    schedule_clip = 'linear'
    layer_norm = True
    state_norm = True
    advantage_norm = True
    lossvalue_norm = True
```

```
In [83... # You need not to rivese this, these classes are used for normalization
class RunningStat(object):
    def __init__(self, shape):
        self._n = 0
        self._M = np.zeros(shape)
        self._S = np.zeros(shape)

    def push(self, x):
        x = np.asarray(x)
        assert x.shape == self._M.shape
        self._n += 1
        if self._n == 1:
            self._M[...] = x
        else:
            oldM = self._M.copy()
            self._M[...] = oldM + (x - oldM) / self._n
            self._S[...] = self._S + (x - oldM) * (x - self._M)

    @property
    def n(self):
        return self._n

    @property
```

```

def mean(self):
    return self._M

@property
def var(self):
    return self._S / (self._n - 1) if self._n > 1 else np.square(self._M)

@property
def std(self):
    return np.sqrt(self.var)

@property
def shape(self):
    return self._M.shape

class ZFilter:
    """
    y = (x-mean)/std
    using running estimates of mean,std
    """

    def __init__(self, shape, demean=True, destd=True, clip=10.0):
        self.demean = demean
        self.destd = destd
        self.clip = clip

        self.rs = RunningStat(shape)

    def __call__(self, x, update=True):
        if update: self.rs.push(x)
        if self.demean:
            x = x - self.rs.mean
        if self.destd:
            x = x / (self.rs.std + 1e-8)
        if self.clip:
            x = np.clip(x, -self.clip, self.clip)
        return x

    def output_shape(self, input_space):
        return input_space.shape

```

In [89...

# Here, you need to finish the first 5 tasks.

```

class ActorCritic(nn.Module):
    def __init__(self, num_inputs, num_outputs, layer_norm=True):
        super(ActorCritic, self).__init__()
        """
        Q1:
        Initialize your networks
        """

        self.actor_fc1 = nn.Linear(3, args.hid_num)
        self.actor_fc2 = nn.Linear(args.hid_num, args.hid_num)
        self.actor_fc3 = nn.Linear(args.hid_num, 1)
        self.actor_logstd = nn.Parameter(torch.zeros(1, num_outputs))
        #self.actor_logstd = nn.Linear(args.hid_num, 1)

        self.critic_fc1 = nn.Linear(3, args.hid_num)
        self.critic_fc2 = nn.Linear(args.hid_num, args.hid_num)
        self.critic_fc3 = nn.Linear(args.hid_num, 1)

        if layer_norm:
            self.layer_norm(self.actor_fc1, std=1.0)
            self.layer_norm(self.actor_fc2, std=1.0)
            self.layer_norm(self.actor_fc3, std=0.01)

            self.layer_norm(self.critic_fc1, std=1.0)
            self.layer_norm(self.critic_fc2, std=1.0)
            self.layer_norm(self.critic_fc3, std=1.0)

    @staticmethod
    def layer_norm(layer, std=1.0, bias_const=0.0):
        torch.nn.init.orthogonal_(layer.weight, std)
        torch.nn.init.constant_(layer.bias, bias_const)

    def forward(self, states):
        """
        Q2.1:
        run policy network (actor) as well as value network (critic)
        :param states: a tensor represents states
        :return: 3 Tensor2
        your _forward_actor() function should return both the mean value of action and the log-standard deviation of the action
        """

        action_mean, action_logstd = self._forward_actor(states)
        critic_value = self._forward_critic(states)
        return action_mean, action_logstd, critic_value

    def _forward_actor(self, states):
        """
        Q2.2:
        build something like
        x = activation (actor_fc(state))
        the logstd output has already been provided
        """
        x1 = F.relu(self.actor_fc1(states))
        x2 = F.relu(self.actor_fc2(x1))
        action_mean = 2.0 * F.tanh(self.actor_fc3(x2))
        action_logstd = self.actor_logstd.expand_as(action_mean)
        #action_logstd = F.softplus(self.actor_logstd(x2))
        return action_mean, action_logstd

    def _forward_critic(self, states):
        """
        Q2.3:
        build something like
        x = activation (critic_fc(state))'''
        c1 = F.relu(self.critic_fc1(states))
        c2 = F.relu(self.critic_fc2(c1))
        critic_value = self.critic_fc3(c2)
        return critic_value

    def select_action(self, action_mean, action_logstd, return_logproba=True):
        """
        Q3.1:

```

```

        given mean and std, sample an action from normal(mean, std)
        also returns probability of the given chosen
        """
        action_std = torch.exp(action_logstd)
        action = torch.normal(action_mean, action_std)
        if return_logproba:
            logproba = self._normal_logproba(action, action_mean, action_logstd, action_std)

        return action, logproba

    @staticmethod
    def _normal_logproba(x, mean, logstd, std=None):
        """
        Q3.2:
        given a mean and logstd of a gaussian,
        calculate the log-probability of a given x'''

        if std is None:
            std = torch.exp(logstd)

        std_sq = std.pow(2)
        logproba = - 0.5 * math.log(2 * math.pi) - logstd - (x - mean).pow(2) / (2 * std_sq)

        return logproba.sum(1)

    def get_logproba(self, states, actions):
        """
        return probability of chosen the given actions under corresponding states of current network
        :param states: Tensor
        :param actions: Tensor
        """
        action_mean, action_logstd = self._forward_actor(states)
        action_mean = action_mean.cpu()
        action_logstd = action_logstd.cpu()
        logproba = self._normal_logproba(actions, action_mean, action_logstd)
        return logproba

class Memory(object):
    def __init__(self):
        self.memory = []

    def push(self, *args):
        self.memory.append(Transition(*args))

    def sample(self):
        return Transition(*zip(*self.memory))

    def __len__(self):
        return len(self.memory)

env = gym.make(ENV_NAME)
num_inputs = env.observation_space.shape[0]
num_actions = env.action_space.shape[0]
network = ActorCritic(num_inputs, num_actions, layer_norm=args.layer_norm)
network.train()
def ppo(args):
    env = gym.make(args.env_name)
    num_inputs = env.observation_space.shape[0]
    num_actions = env.action_space.shape[0]

    env.seed(args.seed)
    torch.manual_seed(args.seed)

    #network = ActorCritic(num_inputs, num_actions, layer_norm=args.layer_norm)
    optimizer = opt.Adam(network.parameters(), lr=args.lr)

    running_state = ZFilter((num_inputs,), clip=5.0)

    # record average 1-round cumulative reward in every episode
    reward_record = []
    global_steps = 0

    lr_now = args.lr
    clip_now = args.clip

    for i_episode in range(args.num_episode):
        # step1: perform current policy to collect trajectories
        # this is an on-policy method!
        memory = Memory()
        num_steps = 0
        reward_list = []
        len_list = []
        while num_steps < args.batch_size:
            state = env.reset()
            if args.state_norm:
                state = running_state(state)
            reward_sum = 0
            for t in range(args.max_step_per_round):
                action_mean, action_logstd, value = network(Tensor(state).unsqueeze(0))
                action, logproba = network.select_action(action_mean, action_logstd)
                action = action.cpu().data.numpy()[0]
                logproba = logproba.cpu().data.numpy()[0]
                next_state, reward, done, _ = env.step(action)

                reward_sum += reward
                if args.state_norm:
                    next_state = running_state(next_state)
                mask = 0 if done else 1

                memory.push(state, value, action, logproba, mask, next_state, reward)

                if done:
                    break

            state = next_state

            num_steps += (t + 1)
            global_steps += (t + 1)
            reward_list.append(reward_sum)
            len_list.append(t + 1)
        reward_record.append({
            'episode': i_episode,
            'steps': global_steps,

```

```

        'meanepreward': np.mean(reward_list),
        'meaneplen': np.mean(len_list)})
    rwdns.extend(reward_list)
    batch = memory.sample()
    batch_size = len(memory)

    # step2: extract variables from trajectories
    rewards = Tensor(batch.reward)
    values = Tensor(batch.value)
    masks = Tensor(batch.mask)
    actions = Tensor(batch.action)
    states = Tensor(batch.state)
    oldlogproba = Tensor(batch.logproba)

    returns = Tensor(batch_size)
    deltas = Tensor(batch_size)
    advantages = Tensor(batch_size)

    prev_return = 0
    prev_value = 0
    prev_advantage = 0
    for i in reversed(range(batch_size)):
        returns[i] = rewards[i] + args.gamma * prev_return * masks[i]
        deltas[i] = rewards[i] + args.gamma * prev_value * masks[i] - values[i]
        # ref: https://arxiv.org/pdf/1506.02438.pdf (generalization advantage estimate)
        advantages[i] = deltas[i] + args.gamma * args.lamda * prev_advantage * masks[i]

        prev_return = returns[i]
        prev_value = values[i]
        prev_advantage = advantages[i]
    if args.advantage_norm:
        advantages = (advantages - advantages.mean()) / (advantages.std() + EPS)

    for i_epoch in range(int(args.num_epoch * batch_size / args.minibatch_size)):
        # sample from current batch
        minibatch_ind = np.random.choice(batch_size, args.minibatch_size, replace=False)
        minibatch_states = states[minibatch_ind]
        minibatch_actions = actions[minibatch_ind]
        minibatch_oldlogproba = oldlogproba[minibatch_ind]
        minibatch_newlogproba = network.get_logproba(minibatch_states, minibatch_actions)
        minibatch_advantages = advantages[minibatch_ind]
        minibatch_returns = returns[minibatch_ind]
        minibatch_newvalues = network._forward_critic(minibatch_states).flatten()
        ...
    Q4:

    HERE:
    now you have the advantages, and log-probabilities (both pi_new and pi_old)
    you need to do optimization according to the CLIP loss

    ...
    ratio = torch.exp(minibatch_newlogproba - minibatch_oldlogproba)

    surr1 = ratio * minibatch_advantages
    surr2 = torch.clamp(ratio, 1.0 - clip_now, 1.0 + clip_now) * minibatch_advantages
    loss_surr = -torch.min(surr1, surr2).mean()

    if args.lossvalue_norm:
        minibatch_return_6std = 6 * minibatch_returns.std()
        loss_value = torch.mean((minibatch_newvalues - minibatch_returns).pow(2)) / minibatch_return_6std
    else:
        loss_value = torch.mean((minibatch_newvalues - minibatch_returns).pow(2))

    loss_entropy = torch.mean(torch.exp(minibatch_newlogproba) * minibatch_newlogproba)

    total_loss = loss_surr + args.loss_coeff_value * loss_value + args.loss_coeff_entropy * loss_entropy
    optimizer.zero_grad()
    total_loss.backward()
    optimizer.step()

    if args.schedule_clip == 'linear':
        ep_ratio = 1 - (i_episode / args.num_episode)
        clip_now = args.clip * ep_ratio

    if args.schedule_adam == 'linear':
        ep_ratio = 1 - (i_episode / args.num_episode)
        lr_now = args.lr * ep_ratio
        for g in optimizer.param_groups:
            g['lr'] = lr_now

    if i_episode % args.log_num_episode == 0:
        print('Finished episode: {} Reward: {:.4f} total_loss = {:.4f} = {:.4f} + {} * {:.4f} + {} * {:.4f}' \
              .format(i_episode, reward_record[-1]['meanepreward'], total_loss.data, loss_surr.data, args.loss_coeff_value,
                    loss_value.data, args.loss_coeff_entropy, loss_entropy.data))
        print('-----')

    return reward_record

def test(args):
    record_dfs = []
    for i in range(args.num_parallel_run):
        args.seed += 1
        reward_record = pd.DataFrame(ppo(args))
        reward_record['#parallel_run'] = i
        record_dfs.append(reward_record)
    record_dfs = pd.concat(record_dfs, axis=0)
    record_dfs.to_csv(joinindir(RESULT_DIR, 'ppo-record-{}.csv'.format(args.env_name)))

if __name__ == '__main__':
    for envname in ENV_NAME:
        args.env_name = envname
        test(args)

torch.save(network.state_dict(), args.env_name.split('-')[0]+'/' + 'CheckPoints/checkpoint_new_{0}hidden'.format(args.hid_num))
np.savetxt(args.env_name.split('-')[0]+'/' + 'Rwds/rwds_new_{0}hidden'.format(args.hid_num), rwdns)
Finished episode: 0 Reward: -1194.6517 total_loss = 68.0502 = 0.0119 + 0.5 * 136.0766 + 0.0 * -0.3305
-----
Finished episode: 1 Reward: -1243.2846 total_loss = 55.1362 = 0.0733 + 0.5 * 110.1258 + 0.0 * -0.3287
-----
Finished episode: 2 Reward: -1145.0080 total_loss = 19.5425 = -0.0032 + 0.5 * 39.0915 + 0.0 * -0.3328
-----
Finished episode: 3 Reward: -1195.5739 total_loss = 14.2249 = 0.0347 + 0.5 * 28.3804 + 0.0 * -0.3311
-----
Finished episode: 4 Reward: -993.0358 total_loss = 11.0362 = -0.0442 + 0.5 * 22.1607 + 0.0 * -0.3326

```

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-----
Finished episode: 5 Reward: -1103.2031 total_loss = 11.2240 = 0.0270 + 0.5 * 22.3941 + 0.0 * -0.3340
-----
Finished episode: 6 Reward: -1125.1347 total_loss = 11.6628 = -0.0567 + 0.5 * 23.4389 + 0.0 * -0.3315
-----
Finished episode: 7 Reward: -1077.1836 total_loss = 10.4020 = -0.0255 + 0.5 * 20.8552 + 0.0 * -0.3306
-----
Finished episode: 8 Reward: -1084.8451 total_loss = 10.6448 = -0.0010 + 0.5 * 21.2915 + 0.0 * -0.3279
-----
Finished episode: 9 Reward: -1055.5481 total_loss = 9.8755 = -0.0787 + 0.5 * 19.9083 + 0.0 * -0.3383
-----
Finished episode: 10 Reward: -991.8471 total_loss = 9.5367 = 0.0671 + 0.5 * 18.9393 + 0.0 * -0.3322
-----
Finished episode: 11 Reward: -924.4476 total_loss = 9.0880 = 0.0061 + 0.5 * 18.1636 + 0.0 * -0.3289
-----
Finished episode: 12 Reward: -1009.8873 total_loss = 8.5686 = 0.0269 + 0.5 * 17.0835 + 0.0 * -0.3330
-----
Finished episode: 13 Reward: -998.6989 total_loss = 9.1496 = -0.0707 + 0.5 * 18.4408 + 0.0 * -0.3279
-----
Finished episode: 14 Reward: -1008.7402 total_loss = 10.0691 = -0.0290 + 0.5 * 20.1962 + 0.0 * -0.3368
-----
Finished episode: 15 Reward: -1000.7883 total_loss = 9.1505 = -0.0194 + 0.5 * 18.3397 + 0.0 * -0.3331
-----
Finished episode: 16 Reward: -936.6700 total_loss = 8.5301 = 0.0446 + 0.5 * 16.9711 + 0.0 * -0.3313
-----
Finished episode: 17 Reward: -957.4993 total_loss = 8.6801 = -0.0552 + 0.5 * 17.4707 + 0.0 * -0.3338
-----
Finished episode: 18 Reward: -960.4810 total_loss = 8.2512 = 0.0194 + 0.5 * 16.4636 + 0.0 * -0.3240
-----
Finished episode: 19 Reward: -947.6910 total_loss = 9.3526 = -0.0333 + 0.5 * 18.7717 + 0.0 * -0.3356
-----
Finished episode: 20 Reward: -994.9229 total_loss = 8.0688 = 0.0620 + 0.5 * 16.0137 + 0.0 * -0.3331
-----
Finished episode: 21 Reward: -988.8330 total_loss = 7.8580 = -0.0109 + 0.5 * 15.7378 + 0.0 * -0.3370
-----
Finished episode: 22 Reward: -955.7307 total_loss = 9.0996 = -0.0954 + 0.5 * 18.3900 + 0.0 * -0.3364
-----
Finished episode: 23 Reward: -894.1858 total_loss = 7.6781 = 0.0340 + 0.5 * 15.2882 + 0.0 * -0.3280
-----
Finished episode: 24 Reward: -904.3489 total_loss = 7.7961 = 0.0331 + 0.5 * 15.5261 + 0.0 * -0.3390
-----
Finished episode: 25 Reward: -825.6181 total_loss = 7.5673 = -0.0451 + 0.5 * 15.2246 + 0.0 * -0.3288
-----
Finished episode: 26 Reward: -872.5494 total_loss = 7.3622 = 0.0248 + 0.5 * 14.6748 + 0.0 * -0.3274
-----
Finished episode: 27 Reward: -913.8328 total_loss = 6.8232 = 0.0379 + 0.5 * 13.5707 + 0.0 * -0.3314
-----
Finished episode: 28 Reward: -731.2570 total_loss = 6.8420 = 0.0757 + 0.5 * 13.5326 + 0.0 * -0.3365
-----
Finished episode: 29 Reward: -736.2265 total_loss = 5.2548 = -0.0308 + 0.5 * 10.5711 + 0.0 * -0.3344
-----
Finished episode: 30 Reward: -717.7144 total_loss = 6.1046 = 0.0060 + 0.5 * 12.1972 + 0.0 * -0.3328
-----
Finished episode: 31 Reward: -541.4207 total_loss = 4.1822 = -0.0073 + 0.5 * 8.3789 + 0.0 * -0.3365
-----
Finished episode: 32 Reward: -508.1312 total_loss = 4.7341 = -0.0693 + 0.5 * 9.6068 + 0.0 * -0.3315
-----
Finished episode: 33 Reward: -427.4228 total_loss = 3.6973 = -0.0431 + 0.5 * 7.4809 + 0.0 * -0.3337
-----
Finished episode: 34 Reward: -302.5476 total_loss = 2.1762 = 0.0284 + 0.5 * 4.2958 + 0.0 * -0.3346
-----
Finished episode: 35 Reward: -290.9784 total_loss = 1.3146 = -0.0046 + 0.5 * 2.6385 + 0.0 * -0.3303
-----
Finished episode: 36 Reward: -250.3631 total_loss = 0.9178 = 0.0255 + 0.5 * 1.7846 + 0.0 * -0.3331
-----
Finished episode: 37 Reward: -251.9737 total_loss = 0.2863 = -0.0340 + 0.5 * 0.6406 + 0.0 * -0.3300
-----
Finished episode: 38 Reward: -244.7047 total_loss = 0.3757 = 0.0376 + 0.5 * 0.6761 + 0.0 * -0.3344
-----
Finished episode: 39 Reward: -219.6781 total_loss = 0.2185 = 0.0023 + 0.5 * 0.4323 + 0.0 * -0.3317
-----
Finished episode: 40 Reward: -191.0291 total_loss = 0.6182 = 0.1081 + 0.5 * 1.0202 + 0.0 * -0.3302
-----
Finished episode: 41 Reward: -207.0479 total_loss = 0.3632 = 0.0351 + 0.5 * 0.6562 + 0.0 * -0.3303
-----
Finished episode: 42 Reward: -168.5137 total_loss = 0.1819 = 0.0111 + 0.5 * 0.3417 + 0.0 * -0.3309
-----
Finished episode: 43 Reward: -155.4616 total_loss = 0.1519 = 0.0224 + 0.5 * 0.2590 + 0.0 * -0.3254
-----
Finished episode: 44 Reward: -163.8864 total_loss = 0.3846 = 0.0316 + 0.5 * 0.7060 + 0.0 * -0.3237
-----
Finished episode: 45 Reward: -254.8340 total_loss = 2.6741 = 0.0639 + 0.5 * 5.2203 + 0.0 * -0.3306
-----
Finished episode: 46 Reward: -150.7260 total_loss = 0.5352 = 0.0176 + 0.5 * 1.0352 + 0.0 * -0.3215
-----
Finished episode: 47 Reward: -178.9703 total_loss = 0.2305 = -0.0141 + 0.5 * 0.4893 + 0.0 * -0.3233
-----
Finished episode: 48 Reward: -189.0749 total_loss = 1.0661 = -0.0307 + 0.5 * 2.1936 + 0.0 * -0.3277
-----
Finished episode: 49 Reward: -186.4039 total_loss = 0.2779 = -0.0127 + 0.5 * 0.5812 + 0.0 * -0.3221
-----
Finished episode: 50 Reward: -175.7133 total_loss = 0.0911 = -0.0435 + 0.5 * 0.2691 + 0.0 * -0.3203
-----
Finished episode: 51 Reward: -185.7720 total_loss = 0.4998 = -0.0616 + 0.5 * 1.1227 + 0.0 * -0.3225
-----
Finished episode: 52 Reward: -156.8426 total_loss = 0.1767 = -0.0180 + 0.5 * 0.3895 + 0.0 * -0.3220
-----
Finished episode: 53 Reward: -159.5112 total_loss = 0.2606 = -0.0299 + 0.5 * 0.5810 + 0.0 * -0.3246
-----
Finished episode: 54 Reward: -180.8635 total_loss = 0.1376 = -0.0387 + 0.5 * 0.3525 + 0.0 * -0.3210
-----
Finished episode: 55 Reward: -145.3744 total_loss = 0.1149 = -0.0472 + 0.5 * 0.3242 + 0.0 * -0.3194
-----
Finished episode: 56 Reward: -163.0976 total_loss = 0.1534 = 0.0276 + 0.5 * 0.2515 + 0.0 * -0.3177
-----
Finished episode: 57 Reward: -186.2005 total_loss = 0.1774 = 0.0100 + 0.5 * 0.3348 + 0.0 * -0.3182
-----
Finished episode: 58 Reward: -141.4161 total_loss = 0.2298 = 0.0296 + 0.5 * 0.4004 + 0.0 * -0.3177
-----
Finished episode: 59 Reward: -145.4108 total_loss = 0.1197 = 0.0180 + 0.5 * 0.2034 + 0.0 * -0.3254
-----
Finished episode: 60 Reward: -167.9015 total_loss = 0.1348 = 0.0534 + 0.5 * 0.1628 + 0.0 * -0.3228
-----
Finished episode: 61 Reward: -160.7984 total_loss = 0.1090 = -0.0079 + 0.5 * 0.2338 + 0.0 * -0.3192
-----
Finished episode: 62 Reward: -177.9858 total_loss = 0.2271 = 0.0326 + 0.5 * 0.3890 + 0.0 * -0.3187
-----

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-----
Finished episode: 63 Reward: -154.5623 total_loss = 0.1878 = 0.0543 + 0.5 * 0.2669 + 0.0 * -0.3214
-----
Finished episode: 64 Reward: -160.4358 total_loss = 0.1437 = 0.0192 + 0.5 * 0.2490 + 0.0 * -0.3164
-----
Finished episode: 65 Reward: -159.0446 total_loss = 0.0814 = -0.0660 + 0.5 * 0.2949 + 0.0 * -0.3148
-----
Finished episode: 66 Reward: -164.8024 total_loss = 0.1204 = -0.0158 + 0.5 * 0.2725 + 0.0 * -0.3196
-----
Finished episode: 67 Reward: -169.6347 total_loss = 0.0552 = -0.0430 + 0.5 * 0.1963 + 0.0 * -0.3204
-----
Finished episode: 68 Reward: -153.5449 total_loss = 0.1006 = -0.0509 + 0.5 * 0.3030 + 0.0 * -0.3145
-----
Finished episode: 69 Reward: -197.0111 total_loss = 0.1250 = -0.0366 + 0.5 * 0.3232 + 0.0 * -0.3167
-----
Finished episode: 70 Reward: -121.6603 total_loss = 0.1606 = -0.0152 + 0.5 * 0.3517 + 0.0 * -0.3149
-----
Finished episode: 71 Reward: -179.6038 total_loss = 0.0863 = -0.0658 + 0.5 * 0.3042 + 0.0 * -0.3195
-----
Finished episode: 72 Reward: -145.4154 total_loss = 0.1101 = -0.0547 + 0.5 * 0.3295 + 0.0 * -0.3143
-----
Finished episode: 73 Reward: -174.8109 total_loss = 0.1221 = 0.0155 + 0.5 * 0.2132 + 0.0 * -0.3120
-----
Finished episode: 74 Reward: -159.4569 total_loss = 0.1073 = 0.0201 + 0.5 * 0.1744 + 0.0 * -0.3158
-----
Finished episode: 75 Reward: -158.4066 total_loss = 0.0315 = -0.0720 + 0.5 * 0.2070 + 0.0 * -0.3106
-----
Finished episode: 76 Reward: -159.5882 total_loss = 0.1204 = -0.0056 + 0.5 * 0.2520 + 0.0 * -0.3102
-----
Finished episode: 77 Reward: -141.2863 total_loss = 0.1236 = 0.0234 + 0.5 * 0.2004 + 0.0 * -0.3143
-----
Finished episode: 78 Reward: -185.0877 total_loss = 0.1792 = 0.0191 + 0.5 * 0.3201 + 0.0 * -0.3091
-----
Finished episode: 79 Reward: -169.6805 total_loss = 0.0629 = -0.0856 + 0.5 * 0.2972 + 0.0 * -0.3131
-----
Finished episode: 80 Reward: -172.1546 total_loss = 0.1748 = 0.0460 + 0.5 * 0.2575 + 0.0 * -0.3158
-----
Finished episode: 81 Reward: -169.5150 total_loss = 0.0675 = 0.0012 + 0.5 * 0.1327 + 0.0 * -0.3080
-----
Finished episode: 82 Reward: -208.3209 total_loss = 1.2423 = 0.0744 + 0.5 * 2.3356 + 0.0 * -0.3126
-----
Finished episode: 83 Reward: -161.5450 total_loss = 0.4674 = 0.0413 + 0.5 * 0.8523 + 0.0 * -0.3125
-----
Finished episode: 84 Reward: -167.6146 total_loss = 0.2123 = -0.0096 + 0.5 * 0.4438 + 0.0 * -0.3122
-----
Finished episode: 85 Reward: -161.4683 total_loss = 0.2224 = -0.0174 + 0.5 * 0.4796 + 0.0 * -0.3090
-----
Finished episode: 86 Reward: -184.9097 total_loss = 0.1059 = -0.0424 + 0.5 * 0.2966 + 0.0 * -0.3067
-----
Finished episode: 87 Reward: -152.7646 total_loss = 0.1333 = 0.0429 + 0.5 * 0.1808 + 0.0 * -0.3049
-----
Finished episode: 88 Reward: -122.1084 total_loss = 0.1194 = -0.0211 + 0.5 * 0.2811 + 0.0 * -0.3094
-----
Finished episode: 89 Reward: -189.4155 total_loss = 0.0979 = 0.0422 + 0.5 * 0.1114 + 0.0 * -0.3090
-----
Finished episode: 90 Reward: -183.4578 total_loss = 0.0338 = -0.0717 + 0.5 * 0.2110 + 0.0 * -0.3115
-----
Finished episode: 91 Reward: -173.8702 total_loss = 0.1292 = -0.0089 + 0.5 * 0.2762 + 0.0 * -0.3110
-----
Finished episode: 92 Reward: -176.9037 total_loss = 0.0257 = -0.0271 + 0.5 * 0.1056 + 0.0 * -0.3044
-----
Finished episode: 93 Reward: -182.3290 total_loss = 0.0886 = -0.0283 + 0.5 * 0.2339 + 0.0 * -0.3090
-----
Finished episode: 94 Reward: -174.7887 total_loss = 0.0528 = -0.0547 + 0.5 * 0.2148 + 0.0 * -0.3073
-----
Finished episode: 95 Reward: -150.9892 total_loss = 0.1066 = 0.0091 + 0.5 * 0.1950 + 0.0 * -0.3055
-----
Finished episode: 96 Reward: -136.9055 total_loss = 0.0738 = 0.0140 + 0.5 * 0.1196 + 0.0 * -0.3069
-----
Finished episode: 97 Reward: -120.5443 total_loss = 0.0366 = -0.0256 + 0.5 * 0.1245 + 0.0 * -0.3087
-----
Finished episode: 98 Reward: -172.7532 total_loss = 0.1270 = 0.0498 + 0.5 * 0.1543 + 0.0 * -0.2980
-----
Finished episode: 99 Reward: -171.6668 total_loss = 0.0601 = 0.0148 + 0.5 * 0.0904 + 0.0 * -0.3052
-----
Finished episode: 100 Reward: -161.1864 total_loss = 0.1508 = 0.0500 + 0.5 * 0.2015 + 0.0 * -0.2951
-----
Finished episode: 101 Reward: -126.1454 total_loss = 0.1386 = 0.0857 + 0.5 * 0.1057 + 0.0 * -0.2977
-----
Finished episode: 102 Reward: -167.6792 total_loss = 0.0441 = -0.0781 + 0.5 * 0.2445 + 0.0 * -0.2898
-----
Finished episode: 103 Reward: -165.4015 total_loss = 0.1795 = 0.0721 + 0.5 * 0.2149 + 0.0 * -0.2940
-----
Finished episode: 104 Reward: -170.4635 total_loss = 0.0549 = -0.0416 + 0.5 * 0.1929 + 0.0 * -0.2965
-----
Finished episode: 105 Reward: -174.8114 total_loss = 0.2513 = 0.0647 + 0.5 * 0.3733 + 0.0 * -0.2877
-----
Finished episode: 106 Reward: -143.8490 total_loss = 0.0774 = -0.0144 + 0.5 * 0.1836 + 0.0 * -0.2912
-----
Finished episode: 107 Reward: -169.2256 total_loss = 0.0878 = 0.0272 + 0.5 * 0.1212 + 0.0 * -0.2850
-----
Finished episode: 108 Reward: -150.4072 total_loss = -0.0362 = -0.1199 + 0.5 * 0.1674 + 0.0 * -0.2806
-----
Finished episode: 109 Reward: -182.3655 total_loss = 0.0733 = 0.0179 + 0.5 * 0.1107 + 0.0 * -0.2841
-----
Finished episode: 110 Reward: -143.0426 total_loss = 0.0770 = 0.0163 + 0.5 * 0.1213 + 0.0 * -0.2846
-----
Finished episode: 111 Reward: -133.5512 total_loss = 0.0572 = -0.0059 + 0.5 * 0.1262 + 0.0 * -0.2801
-----
Finished episode: 112 Reward: -137.0964 total_loss = 0.1156 = 0.0607 + 0.5 * 0.1098 + 0.0 * -0.2814
-----
Finished episode: 113 Reward: -169.7162 total_loss = 0.0879 = -0.0079 + 0.5 * 0.1916 + 0.0 * -0.2786
-----
Finished episode: 114 Reward: -144.3812 total_loss = 0.0535 = 0.0041 + 0.5 * 0.0988 + 0.0 * -0.2872
-----
Finished episode: 115 Reward: -168.8889 total_loss = 0.0311 = -0.0550 + 0.5 * 0.1723 + 0.0 * -0.2796
-----
Finished episode: 116 Reward: -161.6928 total_loss = 0.0348 = 0.0064 + 0.5 * 0.0568 + 0.0 * -0.2860
-----
Finished episode: 117 Reward: -164.1907 total_loss = 0.2693 = 0.0131 + 0.5 * 0.5125 + 0.0 * -0.2780
-----
Finished episode: 118 Reward: -195.2687 total_loss = 0.0949 = -0.0678 + 0.5 * 0.3254 + 0.0 * -0.2818
-----
Finished episode: 119 Reward: -197.0676 total_loss = 0.1906 = 0.0925 + 0.5 * 0.1961 + 0.0 * -0.2754
-----
Finished episode: 120 Reward: -131.3310 total_loss = 0.0766 = 0.0269 + 0.5 * 0.0993 + 0.0 * -0.2717
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-----
Finished episode: 121 Reward: -186.9670 total_loss = 0.1080 = 0.0479 + 0.5 * 0.1201 + 0.0 * -0.2785
-----
Finished episode: 122 Reward: -169.8757 total_loss = 0.0892 = 0.0294 + 0.5 * 0.1196 + 0.0 * -0.2704
-----
Finished episode: 123 Reward: -138.3343 total_loss = 0.0469 = -0.0225 + 0.5 * 0.1389 + 0.0 * -0.2708
-----
Finished episode: 124 Reward: -180.5722 total_loss = 0.1265 = 0.0252 + 0.5 * 0.2027 + 0.0 * -0.2699
-----
Finished episode: 125 Reward: -183.3966 total_loss = 0.0534 = -0.0191 + 0.5 * 0.1450 + 0.0 * -0.2715
-----
Finished episode: 126 Reward: -158.9452 total_loss = 0.0866 = 0.0136 + 0.5 * 0.1460 + 0.0 * -0.2742
-----
Finished episode: 127 Reward: -168.8521 total_loss = 0.1408 = 0.0704 + 0.5 * 0.1407 + 0.0 * -0.2655
-----
Finished episode: 128 Reward: -186.2796 total_loss = 0.1118 = 0.0199 + 0.5 * 0.1836 + 0.0 * -0.2681
-----
Finished episode: 129 Reward: -173.1949 total_loss = 0.1354 = -0.0124 + 0.5 * 0.2955 + 0.0 * -0.2697
-----
Finished episode: 130 Reward: -158.5595 total_loss = 0.0555 = -0.0030 + 0.5 * 0.1169 + 0.0 * -0.2623
-----
Finished episode: 131 Reward: -140.9322 total_loss = 0.0767 = 0.0205 + 0.5 * 0.1123 + 0.0 * -0.2635
-----
Finished episode: 132 Reward: -187.3826 total_loss = 0.1471 = 0.0642 + 0.5 * 0.1659 + 0.0 * -0.2705
-----
Finished episode: 133 Reward: -154.2974 total_loss = 0.0528 = -0.0646 + 0.5 * 0.2349 + 0.0 * -0.2569
-----
Finished episode: 134 Reward: -156.3541 total_loss = 0.0665 = 0.0087 + 0.5 * 0.1157 + 0.0 * -0.2635
-----
Finished episode: 135 Reward: -141.1115 total_loss = 0.1064 = -0.0203 + 0.5 * 0.2533 + 0.0 * -0.2635
-----
Finished episode: 136 Reward: -190.4655 total_loss = 0.1546 = 0.0484 + 0.5 * 0.2125 + 0.0 * -0.2544
-----
Finished episode: 137 Reward: -159.0724 total_loss = 0.1459 = 0.1021 + 0.5 * 0.0875 + 0.0 * -0.2552
-----
Finished episode: 138 Reward: -151.0794 total_loss = -0.0461 = -0.0879 + 0.5 * 0.0838 + 0.0 * -0.2445
-----
Finished episode: 139 Reward: -162.5268 total_loss = 0.0917 = 0.0279 + 0.5 * 0.1276 + 0.0 * -0.2472
-----
Finished episode: 140 Reward: -150.4135 total_loss = 0.1164 = 0.0307 + 0.5 * 0.1715 + 0.0 * -0.2555
-----
Finished episode: 141 Reward: -144.2669 total_loss = 0.0523 = -0.0457 + 0.5 * 0.1961 + 0.0 * -0.2456
-----
Finished episode: 142 Reward: -136.6059 total_loss = 0.0205 = -0.0220 + 0.5 * 0.0850 + 0.0 * -0.2511
-----
Finished episode: 143 Reward: -160.4370 total_loss = 0.0886 = -0.0013 + 0.5 * 0.1798 + 0.0 * -0.2400
-----
Finished episode: 144 Reward: -181.6418 total_loss = 0.0443 = -0.0032 + 0.5 * 0.0949 + 0.0 * -0.2379
-----
Finished episode: 145 Reward: -178.0805 total_loss = 0.0406 = -0.0076 + 0.5 * 0.0963 + 0.0 * -0.2435
-----
Finished episode: 146 Reward: -149.6742 total_loss = 0.0147 = -0.0374 + 0.5 * 0.1040 + 0.0 * -0.2406
-----
Finished episode: 147 Reward: -153.3130 total_loss = 0.0636 = 0.0137 + 0.5 * 0.0997 + 0.0 * -0.2386
-----
Finished episode: 148 Reward: -192.0222 total_loss = 0.1878 = 0.1148 + 0.5 * 0.1460 + 0.0 * -0.2415
-----
Finished episode: 149 Reward: -160.0108 total_loss = 0.0500 = 0.0131 + 0.5 * 0.0738 + 0.0 * -0.2435
-----
Finished episode: 150 Reward: -166.5794 total_loss = 0.1369 = 0.0523 + 0.5 * 0.1691 + 0.0 * -0.2422
-----
Finished episode: 151 Reward: -149.6232 total_loss = 0.0887 = -0.0115 + 0.5 * 0.2004 + 0.0 * -0.2357
-----
Finished episode: 152 Reward: -139.3051 total_loss = 0.0747 = 0.0112 + 0.5 * 0.1269 + 0.0 * -0.2445
-----
Finished episode: 153 Reward: -177.8412 total_loss = 0.0471 = -0.0348 + 0.5 * 0.1639 + 0.0 * -0.2331
-----
Finished episode: 154 Reward: -176.7420 total_loss = 0.1948 = 0.0055 + 0.5 * 0.3787 + 0.0 * -0.2313
-----
Finished episode: 155 Reward: -156.4815 total_loss = 0.0915 = 0.0138 + 0.5 * 0.1555 + 0.0 * -0.2196
-----
Finished episode: 156 Reward: -172.2845 total_loss = 0.1606 = 0.0740 + 0.5 * 0.1733 + 0.0 * -0.2222
-----
Finished episode: 157 Reward: -140.7161 total_loss = 0.0046 = -0.0481 + 0.5 * 0.1053 + 0.0 * -0.2329
-----
Finished episode: 158 Reward: -140.2588 total_loss = 0.2345 = 0.1977 + 0.5 * 0.0736 + 0.0 * -0.2233
-----
Finished episode: 159 Reward: -168.8201 total_loss = 0.3048 = -0.0296 + 0.5 * 0.6687 + 0.0 * -0.2269
-----
Finished episode: 160 Reward: -170.2571 total_loss = 0.0610 = 0.0127 + 0.5 * 0.0966 + 0.0 * -0.2289
-----
Finished episode: 161 Reward: -125.4591 total_loss = 0.0102 = -0.0102 + 0.5 * 0.0409 + 0.0 * -0.2217
-----
Finished episode: 162 Reward: -165.9303 total_loss = 0.0773 = 0.0113 + 0.5 * 0.1320 + 0.0 * -0.2243
-----
Finished episode: 163 Reward: -144.0903 total_loss = 0.0659 = -0.0009 + 0.5 * 0.1336 + 0.0 * -0.2253
-----
Finished episode: 164 Reward: -124.2715 total_loss = 0.0410 = 0.0106 + 0.5 * 0.0609 + 0.0 * -0.2232
-----
Finished episode: 165 Reward: -138.8097 total_loss = 0.0007 = -0.0435 + 0.5 * 0.0885 + 0.0 * -0.2195
-----
Finished episode: 166 Reward: -145.7535 total_loss = 0.0671 = -0.0481 + 0.5 * 0.2303 + 0.0 * -0.2147
-----
Finished episode: 167 Reward: -155.3525 total_loss = -0.0145 = -0.0422 + 0.5 * 0.0555 + 0.0 * -0.2139
-----
Finished episode: 168 Reward: -118.1207 total_loss = 0.1004 = 0.0768 + 0.5 * 0.0473 + 0.0 * -0.2216
-----
Finished episode: 169 Reward: -183.8810 total_loss = 0.0256 = -0.0191 + 0.5 * 0.0895 + 0.0 * -0.2174
-----
Finished episode: 170 Reward: -211.8128 total_loss = 0.1811 = 0.0662 + 0.5 * 0.2299 + 0.0 * -0.2186
-----
Finished episode: 171 Reward: -144.5152 total_loss = 0.0358 = -0.0529 + 0.5 * 0.1773 + 0.0 * -0.2174
-----
Finished episode: 172 Reward: -140.8485 total_loss = 0.1088 = 0.0545 + 0.5 * 0.1087 + 0.0 * -0.2191
-----
Finished episode: 173 Reward: -166.6012 total_loss = 0.0319 = -0.0039 + 0.5 * 0.0715 + 0.0 * -0.2208
-----
Finished episode: 174 Reward: -117.1543 total_loss = 0.0408 = -0.0185 + 0.5 * 0.1187 + 0.0 * -0.2199
-----
Finished episode: 175 Reward: -188.4695 total_loss = 0.1057 = 0.0239 + 0.5 * 0.1635 + 0.0 * -0.2162
-----
Finished episode: 176 Reward: -136.1371 total_loss = 0.0380 = -0.0235 + 0.5 * 0.1230 + 0.0 * -0.2063
-----
Finished episode: 177 Reward: -151.7160 total_loss = 0.0830 = 0.0224 + 0.5 * 0.1210 + 0.0 * -0.2091
-----
Finished episode: 178 Reward: -162.9231 total_loss = 0.1380 = 0.0152 + 0.5 * 0.2456 + 0.0 * -0.2103
```



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-----
Finished episode: 179 Reward: -153.0453 total_loss = 0.0234 = -0.0096 + 0.5 * 0.0660 + 0.0 * -0.2021
Finished episode: 180 Reward: -167.7805 total_loss = -0.0091 = -0.0604 + 0.5 * 0.1025 + 0.0 * -0.2029
Finished episode: 181 Reward: -149.1667 total_loss = 0.1923 = 0.0511 + 0.5 * 0.2823 + 0.0 * -0.2121
Finished episode: 182 Reward: -166.6326 total_loss = 0.0556 = 0.0111 + 0.5 * 0.0890 + 0.0 * -0.2012
Finished episode: 183 Reward: -161.9993 total_loss = 0.0286 = -0.0163 + 0.5 * 0.0899 + 0.0 * -0.1999
Finished episode: 184 Reward: -203.0754 total_loss = 0.0538 = -0.0220 + 0.5 * 0.1516 + 0.0 * -0.1994
Finished episode: 185 Reward: -149.9124 total_loss = -0.0369 = -0.0945 + 0.5 * 0.1152 + 0.0 * -0.2064
Finished episode: 186 Reward: -156.0056 total_loss = 0.1030 = 0.0224 + 0.5 * 0.1613 + 0.0 * -0.1936
Finished episode: 187 Reward: -146.8312 total_loss = -0.0398 = -0.0770 + 0.5 * 0.0744 + 0.0 * -0.2036
Finished episode: 188 Reward: -164.7776 total_loss = 0.1101 = 0.0518 + 0.5 * 0.1166 + 0.0 * -0.1936
Finished episode: 189 Reward: -155.7700 total_loss = 0.0323 = -0.0226 + 0.5 * 0.1099 + 0.0 * -0.1971
Finished episode: 190 Reward: -192.7291 total_loss = 0.0042 = -0.0466 + 0.5 * 0.1017 + 0.0 * -0.1913
Finished episode: 191 Reward: -171.5108 total_loss = 0.0746 = -0.0139 + 0.5 * 0.1771 + 0.0 * -0.2007
Finished episode: 192 Reward: -131.5738 total_loss = -0.0067 = -0.0439 + 0.5 * 0.0743 + 0.0 * -0.1894
Finished episode: 193 Reward: -194.2991 total_loss = 0.0273 = -0.0339 + 0.5 * 0.1224 + 0.0 * -0.1916
Finished episode: 194 Reward: -142.6589 total_loss = 0.1109 = 0.0262 + 0.5 * 0.1693 + 0.0 * -0.1873
Finished episode: 195 Reward: -140.6925 total_loss = 0.0809 = 0.0391 + 0.5 * 0.0835 + 0.0 * -0.1856
Finished episode: 196 Reward: -145.5094 total_loss = 0.1312 = 0.0521 + 0.5 * 0.1582 + 0.0 * -0.1922
Finished episode: 197 Reward: -174.0579 total_loss = 0.0392 = -0.0149 + 0.5 * 0.1082 + 0.0 * -0.1897
Finished episode: 198 Reward: -158.7391 total_loss = 0.0747 = 0.0352 + 0.5 * 0.0790 + 0.0 * -0.1903
Finished episode: 199 Reward: -131.3134 total_loss = -0.0245 = -0.0287 + 0.5 * 0.0085 + 0.0 * -0.1959
Finished episode: 200 Reward: -159.6695 total_loss = 0.0199 = -0.0325 + 0.5 * 0.1048 + 0.0 * -0.1860
Finished episode: 201 Reward: -155.9821 total_loss = 0.0425 = -0.0278 + 0.5 * 0.1405 + 0.0 * -0.1885
Finished episode: 202 Reward: -154.1175 total_loss = 0.1261 = 0.0260 + 0.5 * 0.2003 + 0.0 * -0.1814
Finished episode: 203 Reward: -158.2653 total_loss = 0.0426 = -0.0009 + 0.5 * 0.0871 + 0.0 * -0.1853
Finished episode: 204 Reward: -178.6567 total_loss = 0.1879 = 0.0756 + 0.5 * 0.2246 + 0.0 * -0.1863
Finished episode: 205 Reward: -170.5460 total_loss = 0.0498 = -0.0312 + 0.5 * 0.1621 + 0.0 * -0.1852
Finished episode: 206 Reward: -185.9812 total_loss = 0.0643 = 0.0057 + 0.5 * 0.1172 + 0.0 * -0.1875
Finished episode: 207 Reward: -156.5621 total_loss = 0.2598 = 0.1049 + 0.5 * 0.3098 + 0.0 * -0.1798
Finished episode: 208 Reward: -132.1607 total_loss = 0.0750 = 0.0313 + 0.5 * 0.0873 + 0.0 * -0.1687
Finished episode: 209 Reward: -162.9626 total_loss = 0.1020 = 0.0767 + 0.5 * 0.0505 + 0.0 * -0.1869
Finished episode: 210 Reward: -149.3333 total_loss = 0.0670 = 0.0145 + 0.5 * 0.1050 + 0.0 * -0.1780
Finished episode: 211 Reward: -121.5835 total_loss = 0.0365 = 0.0112 + 0.5 * 0.0506 + 0.0 * -0.1794
Finished episode: 212 Reward: -152.2469 total_loss = 0.1103 = 0.0258 + 0.5 * 0.1690 + 0.0 * -0.1786
Finished episode: 213 Reward: -183.1818 total_loss = 0.0747 = 0.0316 + 0.5 * 0.0861 + 0.0 * -0.1810
Finished episode: 214 Reward: -142.6190 total_loss = 0.2046 = 0.0925 + 0.5 * 0.2241 + 0.0 * -0.1686
Finished episode: 215 Reward: -150.2180 total_loss = 0.0293 = -0.0055 + 0.5 * 0.0698 + 0.0 * -0.1760
Finished episode: 216 Reward: -172.3792 total_loss = 0.0612 = -0.0278 + 0.5 * 0.1782 + 0.0 * -0.1672
Finished episode: 217 Reward: -200.1739 total_loss = 0.1780 = 0.0861 + 0.5 * 0.1838 + 0.0 * -0.1759
Finished episode: 218 Reward: -164.6653 total_loss = -0.0033 = -0.0730 + 0.5 * 0.1394 + 0.0 * -0.1777
Finished episode: 219 Reward: -169.2298 total_loss = 0.0249 = -0.0063 + 0.5 * 0.0624 + 0.0 * -0.1704
Finished episode: 220 Reward: -159.2911 total_loss = 0.0275 = -0.0028 + 0.5 * 0.0607 + 0.0 * -0.1687
Finished episode: 221 Reward: -160.1048 total_loss = 0.0713 = 0.0333 + 0.5 * 0.0759 + 0.0 * -0.1756
Finished episode: 222 Reward: -151.2130 total_loss = 0.0430 = -0.0368 + 0.5 * 0.1595 + 0.0 * -0.1749
Finished episode: 223 Reward: -158.2412 total_loss = 0.0125 = -0.0258 + 0.5 * 0.0764 + 0.0 * -0.1694
Finished episode: 224 Reward: -148.9568 total_loss = 0.0913 = 0.0320 + 0.5 * 0.1185 + 0.0 * -0.1691
Finished episode: 225 Reward: -148.6516 total_loss = -0.0245 = -0.1040 + 0.5 * 0.1590 + 0.0 * -0.1645
Finished episode: 226 Reward: -144.2621 total_loss = 0.0783 = 0.0187 + 0.5 * 0.1193 + 0.0 * -0.1627
Finished episode: 227 Reward: -162.0155 total_loss = 0.0267 = -0.0209 + 0.5 * 0.0952 + 0.0 * -0.1789
Finished episode: 228 Reward: -148.9926 total_loss = 0.0246 = -0.0086 + 0.5 * 0.0663 + 0.0 * -0.1631
Finished episode: 229 Reward: -153.2911 total_loss = 0.0594 = 0.0116 + 0.5 * 0.0957 + 0.0 * -0.1570
Finished episode: 230 Reward: -167.0148 total_loss = 0.0647 = -0.0005 + 0.5 * 0.1303 + 0.0 * -0.1619
Finished episode: 231 Reward: -142.4193 total_loss = 0.0137 = -0.0137 + 0.5 * 0.0547 + 0.0 * -0.1549
Finished episode: 232 Reward: -176.6208 total_loss = 0.1568 = 0.0598 + 0.5 * 0.1941 + 0.0 * -0.1615
Finished episode: 233 Reward: -150.9008 total_loss = 0.0500 = -0.0013 + 0.5 * 0.1026 + 0.0 * -0.1603
Finished episode: 234 Reward: -135.6832 total_loss = 0.0386 = -0.0204 + 0.5 * 0.1179 + 0.0 * -0.1769
Finished episode: 235 Reward: -165.6237 total_loss = 0.0618 = -0.0081 + 0.5 * 0.1398 + 0.0 * -0.1673
Finished episode: 236 Reward: -170.7374 total_loss = -0.0184 = -0.1024 + 0.5 * 0.1679 + 0.0 * -0.1572
```

```
-----
Finished episode: 237 Reward: -143.6819 total_loss = 0.1034 = 0.0457 + 0.5 * 0.1155 + 0.0 * -0.1639
-----
Finished episode: 238 Reward: -175.3523 total_loss = 0.0744 = 0.0098 + 0.5 * 0.1291 + 0.0 * -0.1660
-----
Finished episode: 239 Reward: -169.3130 total_loss = 0.0320 = -0.0037 + 0.5 * 0.0714 + 0.0 * -0.1543
-----
Finished episode: 240 Reward: -116.8346 total_loss = 0.0410 = -0.0033 + 0.5 * 0.0885 + 0.0 * -0.1481
-----
Finished episode: 241 Reward: -163.5786 total_loss = 0.0827 = 0.0456 + 0.5 * 0.0742 + 0.0 * -0.1559
-----
Finished episode: 242 Reward: -174.0572 total_loss = 0.1195 = 0.0740 + 0.5 * 0.0910 + 0.0 * -0.1658
-----
Finished episode: 243 Reward: -186.8396 total_loss = 0.0255 = -0.0434 + 0.5 * 0.1379 + 0.0 * -0.1573
-----
Finished episode: 244 Reward: -150.8410 total_loss = 0.1267 = 0.0987 + 0.5 * 0.0560 + 0.0 * -0.1472
-----
Finished episode: 245 Reward: -146.4224 total_loss = 0.0371 = -0.0116 + 0.5 * 0.0975 + 0.0 * -0.1441
-----
Finished episode: 246 Reward: -157.4663 total_loss = 0.0725 = 0.0006 + 0.5 * 0.1438 + 0.0 * -0.1523
-----
Finished episode: 247 Reward: -137.7312 total_loss = 0.0999 = -0.0001 + 0.5 * 0.1999 + 0.0 * -0.1546
-----
Finished episode: 248 Reward: -138.7914 total_loss = 0.0136 = -0.0234 + 0.5 * 0.0740 + 0.0 * -0.1493
-----
Finished episode: 249 Reward: -147.2374 total_loss = -0.0215 = -0.0301 + 0.5 * 0.0172 + 0.0 * -0.1556
-----
Finished episode: 250 Reward: -174.9089 total_loss = 0.0295 = -0.0221 + 0.5 * 0.1032 + 0.0 * -0.1535
-----
Finished episode: 251 Reward: -143.5734 total_loss = 0.0389 = 0.0011 + 0.5 * 0.0757 + 0.0 * -0.1596
-----
Finished episode: 252 Reward: -174.2360 total_loss = 0.0696 = -0.0164 + 0.5 * 0.1721 + 0.0 * -0.1536
-----
Finished episode: 253 Reward: -176.5496 total_loss = 0.0930 = 0.0336 + 0.5 * 0.1188 + 0.0 * -0.1503
-----
Finished episode: 254 Reward: -159.8601 total_loss = 0.0369 = -0.0056 + 0.5 * 0.0851 + 0.0 * -0.1420
-----
Finished episode: 255 Reward: -162.9733 total_loss = -0.0089 = -0.0719 + 0.5 * 0.1260 + 0.0 * -0.1624
-----
Finished episode: 256 Reward: -150.7205 total_loss = 0.0748 = 0.0056 + 0.5 * 0.1385 + 0.0 * -0.1516
-----
Finished episode: 257 Reward: -156.8677 total_loss = 0.0722 = 0.0123 + 0.5 * 0.1197 + 0.0 * -0.1615
-----
Finished episode: 258 Reward: -121.5952 total_loss = 0.0944 = 0.0691 + 0.5 * 0.0504 + 0.0 * -0.1488
-----
Finished episode: 259 Reward: -125.2019 total_loss = 0.0998 = 0.0276 + 0.5 * 0.1444 + 0.0 * -0.1532
-----
Finished episode: 260 Reward: -156.2780 total_loss = 0.0530 = 0.0018 + 0.5 * 0.1025 + 0.0 * -0.1568
-----
Finished episode: 261 Reward: -153.3082 total_loss = 0.0693 = 0.0181 + 0.5 * 0.1024 + 0.0 * -0.1522
-----
Finished episode: 262 Reward: -152.2158 total_loss = 0.0256 = -0.0635 + 0.5 * 0.1783 + 0.0 * -0.1479
-----
Finished episode: 263 Reward: -143.0874 total_loss = 0.0461 = -0.0045 + 0.5 * 0.1012 + 0.0 * -0.1533
-----
Finished episode: 264 Reward: -161.1246 total_loss = 0.0730 = 0.0173 + 0.5 * 0.1114 + 0.0 * -0.1485
-----
Finished episode: 265 Reward: -142.5330 total_loss = 0.0360 = 0.0107 + 0.5 * 0.0505 + 0.0 * -0.1423
-----
Finished episode: 266 Reward: -134.6514 total_loss = 0.0354 = -0.0129 + 0.5 * 0.0967 + 0.0 * -0.1466
-----
Finished episode: 267 Reward: -153.5022 total_loss = 0.2378 = 0.1758 + 0.5 * 0.1239 + 0.0 * -0.1482
-----
Finished episode: 268 Reward: -125.0131 total_loss = 0.1209 = 0.0241 + 0.5 * 0.1935 + 0.0 * -0.1521
-----
Finished episode: 269 Reward: -111.9794 total_loss = 0.0507 = -0.0159 + 0.5 * 0.1333 + 0.0 * -0.1416
-----
Finished episode: 270 Reward: -122.7424 total_loss = 0.0304 = 0.0050 + 0.5 * 0.0508 + 0.0 * -0.1551
-----
Finished episode: 271 Reward: -169.1819 total_loss = 0.0343 = -0.0299 + 0.5 * 0.1282 + 0.0 * -0.1349
-----
Finished episode: 272 Reward: -117.6685 total_loss = -0.0589 = -0.0881 + 0.5 * 0.0584 + 0.0 * -0.1460
-----
Finished episode: 273 Reward: -177.1862 total_loss = 0.0932 = -0.0090 + 0.5 * 0.2044 + 0.0 * -0.1538
-----
Finished episode: 274 Reward: -157.4801 total_loss = 0.0486 = -0.0162 + 0.5 * 0.1296 + 0.0 * -0.1409
-----
Finished episode: 275 Reward: -153.6709 total_loss = 0.1377 = 0.0269 + 0.5 * 0.2215 + 0.0 * -0.1591
-----
Finished episode: 276 Reward: -166.3909 total_loss = 0.0072 = -0.0191 + 0.5 * 0.0527 + 0.0 * -0.1433
-----
Finished episode: 277 Reward: -153.8322 total_loss = 0.0151 = -0.0543 + 0.5 * 0.1388 + 0.0 * -0.1456
-----
Finished episode: 278 Reward: -141.0948 total_loss = 0.0494 = 0.0005 + 0.5 * 0.0978 + 0.0 * -0.1496
-----
Finished episode: 279 Reward: -130.1244 total_loss = 0.0053 = -0.0949 + 0.5 * 0.2005 + 0.0 * -0.1392
-----
Finished episode: 280 Reward: -136.6705 total_loss = 0.0651 = 0.0234 + 0.5 * 0.0835 + 0.0 * -0.1430
-----
Finished episode: 281 Reward: -158.0004 total_loss = 0.1797 = 0.1193 + 0.5 * 0.1209 + 0.0 * -0.1408
-----
Finished episode: 282 Reward: -170.0517 total_loss = -0.0266 = -0.0729 + 0.5 * 0.0927 + 0.0 * -0.1383
-----
Finished episode: 283 Reward: -143.4554 total_loss = 0.0948 = 0.0228 + 0.5 * 0.1441 + 0.0 * -0.1500
-----
Finished episode: 284 Reward: -125.6853 total_loss = 0.0582 = 0.0115 + 0.5 * 0.0935 + 0.0 * -0.1398
-----
Finished episode: 285 Reward: -141.3971 total_loss = -0.0119 = -0.0539 + 0.5 * 0.0841 + 0.0 * -0.1391
-----
Finished episode: 286 Reward: -156.9646 total_loss = -0.0631 = -0.0883 + 0.5 * 0.0504 + 0.0 * -0.1328
-----
Finished episode: 287 Reward: -162.1765 total_loss = 0.0982 = 0.0435 + 0.5 * 0.1093 + 0.0 * -0.1509
-----
Finished episode: 288 Reward: -167.3542 total_loss = -0.0160 = -0.0541 + 0.5 * 0.0763 + 0.0 * -0.1345
-----
Finished episode: 289 Reward: -184.1743 total_loss = 0.0039 = -0.0666 + 0.5 * 0.1409 + 0.0 * -0.1506
-----
Finished episode: 290 Reward: -165.3589 total_loss = 0.1017 = 0.0399 + 0.5 * 0.1235 + 0.0 * -0.1444
-----
Finished episode: 291 Reward: -154.9424 total_loss = 0.1682 = 0.0366 + 0.5 * 0.2630 + 0.0 * -0.1676
-----
Finished episode: 292 Reward: -122.8492 total_loss = 0.1079 = -0.0340 + 0.5 * 0.2838 + 0.0 * -0.1426
-----
Finished episode: 293 Reward: -136.0648 total_loss = 0.0473 = 0.0193 + 0.5 * 0.0561 + 0.0 * -0.1512
-----
Finished episode: 294 Reward: -126.9699 total_loss = 0.1064 = 0.0464 + 0.5 * 0.1200 + 0.0 * -0.1402
```

```

-----
Finished episode: 295 Reward: -143.5982 total_loss = 0.1242 = 0.0577 + 0.5 * 0.1330 + 0.0 * -0.1378
-----
Finished episode: 296 Reward: -175.4615 total_loss = 0.0598 = -0.0100 + 0.5 * 0.1397 + 0.0 * -0.1361
-----
Finished episode: 297 Reward: -176.5427 total_loss = 0.0620 = -0.0220 + 0.5 * 0.1430 + 0.0 * -0.1510
-----

```

## DDPG and TD3

The Deterministic Policy Gradient method was proposed by Silver et. al. 2014 (<http://proceedings.mlr.press/v32/silver14.pdf>), and DDPG is its deep version.

The DPG also uses the actor-critic paradigm, but maintains a deterministic version of policy. It optimizes the critic through the Bellman Equation, and optimize the actor through the chain rule.

In this assignment, you may need to import some python files like DDPG.py and TD3.py to insert the method into training. Here are some solutions from stackoverflow: <https://stackoverflow.com/questions/48905127/importing-py-files-in-google-colab>.

It is easier to just copy it from Drive than upload it.

1. Store MYLIB.py in your Drive. (for this assignment, it will be the utils.py, DDPG.py and TD3.py)
2. Open the Colab.
3. Open the left side pane, select Files view (the file icon).
4. Click Mount Drive then Connect to Google Drive (the folder with google drive icon).
5. Copy it by running "! cp drive/My\ Drive/MYLIB.py ." in your Colab file code line.
6. import MYLIB

## TODOs for You (Please write down the answer in this block)

The TD3 is short for *Twin Delayed Deep Deterministic Policy Gradient*, their official open-source implementation is extremely clear and easy to follow! So I believe there is no need for you to build up the wheels one more time.

However, you really need to know about how this method works! TD3 proposes several improvements based on the method of DDPG to improve its sample efficiency.

- Q6. In this part, your task is to read the paper, and read the code of the official implementation of TD3 and DDPG at:

<https://github.com/sfujim/TD3/blob/master/DDPG.py>

<https://github.com/sfujim/TD3/blob/master/TD3.py>

Then, please try to find the proposed improvements in TD3 over DDPG and summary them HERE:

1. Clipped Double Q-Learning for Actor-Critic

- code: `target_Q = torch.min(target_Q1, target_Q2)`

1. Target Networks and Delayed Policy Updates

- code: # Delayed policy updates

```
if self.total_it % self.policy_freq == 0:
```

```
    # Compute actor losse
    actor_loss = -self.critic.Q1(state, self.actor(state)).mean()
```

```
    # Optimize the actor
    self.actor_optimizer.zero_grad()
    actor_loss.backward()
    self.actor_optimizer.step()
```

```
    # Update the frozen target models
    for param, target_param in zip(self.critic.parameters(), self.critic_target.parameters()):
        target_param.data.copy_(self.tau * param.data + (1 - self.tau) * target_param.data)
```

```
    for param, target_param in zip(self.actor.parameters(), self.actor_target.parameters()):
        target_param.data.copy_(self.tau * param.data + (1 - self.tau) * target_param.data)
```

2. Target Policy Smoothing Regularization

- code: # Select action according to policy and add clipped noise

```
noise = (
    torch.randn_like(action) * self.policy_noise
).clamp(-self.noise_clip, self.noise_clip)
```

```
next_action = (
    self.actor_target(next_state) + noise
).clamp(-self.max_action, self.max_action)
```

1. Designed Two Twin Q networks

- code: `target_Q1, target_Q2 = self.critic_target(next_state, next_action)`

- Q7. Among all those improvements, which do you believe is the most important one? You may take some ablation studies to support your claim. (i.e., draw some learning curves with different settings together and draw your conclusions)

- Answer: I think the improvement of Clipped Double Q-Learning is the most important in TD3. I have carried out many ablation experiments with different random seeds for the three main improvements (Clipped Double Q-Learning, Delayed Policy, Target Policy Smoothing) and contributions of TD3. In order to compare the performance of the algorithm better, I removed one of the improved methods in the TD3 framework, trained and tested the performance of the algorithm in the Hopper-V3 environment of MuJoCo, and recorded the learning curves about rewards and the number of evaluations, as shown in the figure. From the figure, we can observe that the performance of the TD3-CDQ algorithm is the worst, which removed CDQ, indicating that CDQ is essential to the performance improvement of the TD3 algorithm; the performance of the TD3-TPS algorithm is poor, which removed TPS, indicating that TPS has a certain effect on the performance of TD3; There is little difference between the effects of TD3-DP and TD3 algorithms. Although the rewards harvested by the TD3-DP algorithm can reach a very high value at sometime, it is constantly updated to the unstable estimated value, the policy fluctuates greatly and is unstable.

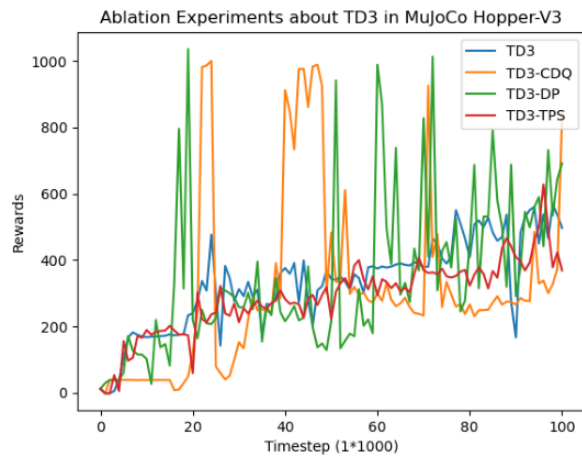
In [14..

```

%matplotlib notebook
from PIL import Image
img = Image.open(os.path.join('Ablation Experiments about TD3.png'))
plt.figure("Image")
plt.imshow(img)
plt.axis('off')

```

```
plt.show()
```



- Q8. What is the difference between TD3(DDPG) and PPO in the OPTIMIZATION step (including but not restricted in terms of the sampling-training proportion)? Actually the improvements of PPO over TRPO was pointed as a benefit of more training iterations, can you further improve the sample efficiency of TD3?

- Answer-(i): Firstly, TD3 and DDPG are all off-policy, but PPO is on-policy. In TD3 and DDPG, The method of experience replay is used to update the policy by sampling old data, that is, the policy used to generate action data and the policy used for evaluation are not the same policy. But in PPO, a new policy is used to collect samples. After the policy is updated, the previous sample data needs to be discarded. Secondly, in PPO, Actor produces the mean and variance of the policy distribution. But, in TD3 and DDPG, Actor produces directly a deterministic policy.
- Answer-(ii): The improvements of PPO over TRPO in sample efficiency can be viewed as benefit of more training iterations as the importance sampling obtains an unbiased estimation of expectation based on past samples which can be regarded as "partially off-policy" and thus improving the sample efficiency.

- Q9. (i) Please describe the difference of the exploration strategies between PPO, DDPG and TD3. (ii) Provide a comparison between the exploration strategies of those continuous control algorithms and DQN.

- Answer-(i): (a) PPO trains policies in an on-policy way. This means it explores by sampling actions according to the latest version of its policy. Since it obtains the action by sampling the probability distribution of the action, it is inherently random in this process. But this randomness depends on the initial conditions and the training process. (b) DDPG uses an off-policy method to train a policy. In order to make the DDPG policy better explored, time-related OU noise is added to the policy during the training process. (c) TD3 uses a technique at the beginning of training to improve exploration in order to facilitate the acquisition of higher quality training data. For a fixed number of steps at the beginning (using the start\_steps keyword parameter setting), the agent will take actions sampled from a uniform random distribution of effective actions. After that, it will return to normal TD3 exploration.
- Answer-(ii): DQN adopts the  $\epsilon$ -greedy strategy that combines exploration and exploitation. It randomly selects one action from all actions with the probability of  $\epsilon$ , and selects the optimal action considered by the model with the probability of  $1-\epsilon$ . However, this  $\epsilon$ -greedy strategy is different from the exploration strategy in continuous control. In continuous control, such as TD3 and DDPG, they add different noise to the action space for better exploration. PPO uses the randomness of the probability distribution for better exploration, because its actions are selected according to the probability distribution and have a certain degree of randomness.

- Q10. (Bonus, 20 points) An open question. Do you think an epsilon-greedy-like exploration strategy you used in DQN/Q-learning is useful for continuous control? Will there be any problem of applying epsilon-greedy method in DDPG/TD3/PPO? Try to implement the idea and report the results.

- Answer: In my opinion, the epsilon-greedy-like exploration strategy can also be used in continuous control. In DDPG and TD3, We can also implement a  $\epsilon$ -greedy strategy, choosing randomly generated continuous actions under the probability of  $\epsilon$ , and choosing the optimal action predicted by the model under the probability of  $1-\epsilon$ . I have implemented the  $\epsilon$ -greedy strategy in DDPG and TD3 in the following, the results shown as follow. Though the result, we can see DDPG and TD3 added  $\epsilon$ -greedy strategy are great. But in PPO, in my view, PPO have used the randomness of the probability distribution for better exploration, because its actions are selected according to the probability distribution and have a certain degree of randomness. So we don't need to use epsilon-greedy-like exploration strategy in PPO.

The following four blocks download the code in official implementation to your google drive so that the following script can run them. Note that the downloaded files may disappear due to some colab mechsansim.

```
In [41... !git clone https://github.com/sfujim/TD3.git
```

```
正克隆到 'TD3' ...
remote: Enumerating objects: 223, done.
remote: Total 223 (delta 0), reused 0 (delta 0), pack-reused 223
接收对象中: 100% (223/223), 197.79 KiB | 444.00 KiB/s, 完成.
处理 delta 中: 100% (62/62), 完成.
```

```
In [42... !cp TD3/DDPG.py .
```

```
In [43... !cp TD3/TD3.py .
```

```
In [44... !cp TD3/utils.py .
```

```
In [45... from os import makedirs as mkdir
mkdir('results', exist_ok=True)
```

```
In [10... # The following scripts run the DDPG algorithm.
```

```
alias = 'ddpg' # an alias of your experiment, used as a label
```

```
import matplotlib.pyplot as plt
import numpy as np
import torch
import gym
```

```

import argparse
import os
import torch.nn.functional as F
import utils
import TD3
import DDPG

def eval_policy(policy, eval_episodes=10):
    eval_env = gym.make(ENV_NAME)

    avg_reward = 0.
    for _ in range(eval_episodes):
        state, done = eval_env.reset(), False
        while not done:
            action = policy.select_action(np.array(state))
            state, reward, done, _ = eval_env.step(action)
            avg_reward += reward

    avg_reward /= eval_episodes
    #print("-----")
    #print(f"Evaluation over {eval_episodes} episodes: {avg_reward:.3f}")
    #print("-----")
    return avg_reward

env = gym.make(ENV_NAME)
torch.manual_seed(0)
np.random.seed(0)

state_dim = env.observation_space.shape[0]
action_dim = env.action_space.shape[0]
max_action = env.action_space.high[0]

args_policy_noise = 0.2
args_noise_clip = 0.5
args_policy_freq = 2
args_max_timesteps = 100000
args_expl_noise = 0.1
args_batch_size = 25
args_eval_freq = 1000
args_start_timesteps = 0

kwargs = {
    "state_dim": state_dim,
    "action_dim": action_dim,
    "max_action": max_action,
    "discount": 0.99,
    "tau": 0.005
}

args_policy = 'DDPG'

if args_policy == "TD3":
    # Target policy smoothing is scaled wrt the action scale
    kwargs["policy_noise"] = args_policy_noise * max_action
    kwargs["noise_clip"] = args_noise_clip * max_action
    kwargs["policy_freq"] = args_policy_freq
    policy = TD3.TD3(**kwargs)
elif args_policy == "DDPG":
    policy = DDPG.DDPG(**kwargs)
replay_buffer = utils.ReplayBuffer(state_dim, action_dim)

# Evaluate untrained policy
evaluations = [eval_policy(policy)]

state, done = env.reset(), False
episode_reward = 0
episode_timesteps = 0
episode_num = 0
counter = 0
msk_list = []
temp_curve = [eval_policy(policy)]
temp_val = []
for t in range(int(args_max_timesteps)):
    episode_timesteps += 1
    counter += 1
    # Select action randomly or according to policy
    if t < args_start_timesteps:
        action = np.random.uniform(-max_action, max_action, action_dim)
    else:
        # ε-greedy strategy
        if np.random.uniform(0,1) < 0.1:
            action = np.random.uniform(-max_action, max_action, action_dim)
        else:
            action = (
                policy.select_action(np.array(state))
                + np.random.normal(0, max_action * args_expl_noise, size=action_dim)
            ).clip(-max_action, max_action)

    # Perform action
    next_state, reward, done, _ = env.step(action)
    done_bool = float(done) if episode_timesteps < env._max_episode_steps else 0

    replay_buffer.add(state, action, next_state, reward, done_bool)

    state = next_state
    episode_reward += reward

    if t >= args_start_timesteps:
        # TD3
        last_val = 999.
        patient = 5
        for i in range(1):
            policy.train(replay_buffer, args_batch_size)

# Train agent after collecting sufficient data
if done:
    print(f"Total T: {t+1} Episode Num: {episode_num+1} Episode T: {episode_timesteps} Reward: {episode_reward:.3f}")
    msk_list = []
    state, done = env.reset(), False
    episode_reward = 0
    episode_timesteps = 0
    episode_num += 1

```

```
# Evaluate episode
if (t + 1) % args_eval_freq == 0:
    evaluations.append(eval_policy(policy))
    print('recent Evaluation:', evaluations[-1])
    np.save('results/evaluations_alias{}_ENV{}'.format(alias, ENV_NAME), evaluations)
```

Total T: 200 Episode Num: 1 Episode T: 200 Reward: -1376.161  
 Total T: 400 Episode Num: 2 Episode T: 200 Reward: -1526.422  
 Total T: 600 Episode Num: 3 Episode T: 200 Reward: -1628.067  
 Total T: 800 Episode Num: 4 Episode T: 200 Reward: -1622.660  
 Total T: 1000 Episode Num: 5 Episode T: 200 Reward: -1517.344  
 recent Evaluation: -1489.3857641899976  
 Total T: 1200 Episode Num: 6 Episode T: 200 Reward: -1381.973  
 Total T: 1400 Episode Num: 7 Episode T: 200 Reward: -1576.874  
 Total T: 1600 Episode Num: 8 Episode T: 200 Reward: -1475.352  
 Total T: 1800 Episode Num: 9 Episode T: 200 Reward: -1186.235  
 Total T: 2000 Episode Num: 10 Episode T: 200 Reward: -1197.236  
 recent Evaluation: -1045.988905391679  
 Total T: 2200 Episode Num: 11 Episode T: 200 Reward: -680.702  
 Total T: 2400 Episode Num: 12 Episode T: 200 Reward: -1078.568  
 Total T: 2600 Episode Num: 13 Episode T: 200 Reward: -833.301  
 Total T: 2800 Episode Num: 14 Episode T: 200 Reward: -941.850  
 Total T: 3000 Episode Num: 15 Episode T: 200 Reward: -895.074  
 recent Evaluation: -948.6955957870275  
 Total T: 3200 Episode Num: 16 Episode T: 200 Reward: -937.168  
 Total T: 3400 Episode Num: 17 Episode T: 200 Reward: -1024.879  
 Total T: 3600 Episode Num: 18 Episode T: 200 Reward: -773.153  
 Total T: 3800 Episode Num: 19 Episode T: 200 Reward: -669.912  
 Total T: 4000 Episode Num: 20 Episode T: 200 Reward: -519.206  
 recent Evaluation: -531.7807222744534  
 Total T: 4200 Episode Num: 21 Episode T: 200 Reward: -518.149  
 Total T: 4400 Episode Num: 22 Episode T: 200 Reward: -655.396  
 Total T: 4600 Episode Num: 23 Episode T: 200 Reward: -393.233  
 Total T: 4800 Episode Num: 24 Episode T: 200 Reward: -261.306  
 Total T: 5000 Episode Num: 25 Episode T: 200 Reward: -244.218  
 recent Evaluation: -224.3824569694488  
 Total T: 5200 Episode Num: 26 Episode T: 200 Reward: -129.646  
 Total T: 5400 Episode Num: 27 Episode T: 200 Reward: -387.672  
 Total T: 5600 Episode Num: 28 Episode T: 200 Reward: -268.643  
 Total T: 5800 Episode Num: 29 Episode T: 200 Reward: -132.434  
 Total T: 6000 Episode Num: 30 Episode T: 200 Reward: -431.672  
 recent Evaluation: -244.6684830603993  
 Total T: 6200 Episode Num: 31 Episode T: 200 Reward: -260.105  
 Total T: 6400 Episode Num: 32 Episode T: 200 Reward: -239.014  
 Total T: 6600 Episode Num: 33 Episode T: 200 Reward: -528.550  
 Total T: 6800 Episode Num: 34 Episode T: 200 Reward: -258.396  
 Total T: 7000 Episode Num: 35 Episode T: 200 Reward: -253.213  
 recent Evaluation: -199.4364711778272  
 Total T: 7200 Episode Num: 36 Episode T: 200 Reward: -130.992  
 Total T: 7400 Episode Num: 37 Episode T: 200 Reward: -119.691  
 Total T: 7600 Episode Num: 38 Episode T: 200 Reward: -134.382  
 Total T: 7800 Episode Num: 39 Episode T: 200 Reward: -133.233  
 Total T: 8000 Episode Num: 40 Episode T: 200 Reward: -258.547  
 recent Evaluation: -200.97251247738888  
 Total T: 8200 Episode Num: 41 Episode T: 200 Reward: -250.789  
 Total T: 8400 Episode Num: 42 Episode T: 200 Reward: -131.830  
 Total T: 8600 Episode Num: 43 Episode T: 200 Reward: -242.723  
 Total T: 8800 Episode Num: 44 Episode T: 200 Reward: -494.932  
 Total T: 9000 Episode Num: 45 Episode T: 200 Reward: -130.554  
 recent Evaluation: -135.66432814083402  
 Total T: 9200 Episode Num: 46 Episode T: 200 Reward: -117.769  
 Total T: 9400 Episode Num: 47 Episode T: 200 Reward: -123.214  
 Total T: 9600 Episode Num: 48 Episode T: 200 Reward: -410.069  
 Total T: 9800 Episode Num: 49 Episode T: 200 Reward: -237.167  
 Total T: 10000 Episode Num: 50 Episode T: 200 Reward: -132.423  
 recent Evaluation: -183.39275598903157  
 Total T: 10200 Episode Num: 51 Episode T: 200 Reward: -122.439  
 Total T: 10400 Episode Num: 52 Episode T: 200 Reward: -129.394  
 Total T: 10600 Episode Num: 53 Episode T: 200 Reward: -242.219  
 Total T: 10800 Episode Num: 54 Episode T: 200 Reward: -376.340  
 Total T: 11000 Episode Num: 55 Episode T: 200 Reward: -538.559  
 recent Evaluation: -150.46612658693795  
 Total T: 11200 Episode Num: 56 Episode T: 200 Reward: -366.445  
 Total T: 11400 Episode Num: 57 Episode T: 200 Reward: -253.891  
 Total T: 11600 Episode Num: 58 Episode T: 200 Reward: -119.812  
 Total T: 11800 Episode Num: 59 Episode T: 200 Reward: -540.262  
 Total T: 12000 Episode Num: 60 Episode T: 200 Reward: -248.619  
 recent Evaluation: -99.92263313104004  
 Total T: 12200 Episode Num: 61 Episode T: 200 Reward: -132.355  
 Total T: 12400 Episode Num: 62 Episode T: 200 Reward: -248.487  
 Total T: 12600 Episode Num: 63 Episode T: 200 Reward: -486.956  
 Total T: 12800 Episode Num: 64 Episode T: 200 Reward: -133.216  
 Total T: 13000 Episode Num: 65 Episode T: 200 Reward: -119.642  
 recent Evaluation: -172.2028752277419  
 Total T: 13200 Episode Num: 66 Episode T: 200 Reward: -126.192  
 Total T: 13400 Episode Num: 67 Episode T: 200 Reward: -125.032  
 Total T: 13600 Episode Num: 68 Episode T: 200 Reward: -117.557  
 Total T: 13800 Episode Num: 69 Episode T: 200 Reward: -126.362  
 Total T: 14000 Episode Num: 70 Episode T: 200 Reward: -128.366  
 recent Evaluation: -147.25244570039914  
 Total T: 14200 Episode Num: 71 Episode T: 200 Reward: -126.638  
 Total T: 14400 Episode Num: 72 Episode T: 200 Reward: -352.944  
 Total T: 14600 Episode Num: 73 Episode T: 200 Reward: -494.537  
 Total T: 14800 Episode Num: 74 Episode T: 200 Reward: -2.502  
 Total T: 15000 Episode Num: 75 Episode T: 200 Reward: -130.994  
 recent Evaluation: -173.78592676845543  
 Total T: 15200 Episode Num: 76 Episode T: 200 Reward: -134.078  
 Total T: 15400 Episode Num: 77 Episode T: 200 Reward: -260.805  
 Total T: 15600 Episode Num: 78 Episode T: 200 Reward: -130.862  
 Total T: 15800 Episode Num: 79 Episode T: 200 Reward: -1.267  
 Total T: 16000 Episode Num: 80 Episode T: 200 Reward: -375.605  
 recent Evaluation: -181.60296301781312  
 Total T: 16200 Episode Num: 81 Episode T: 200 Reward: -332.107  
 Total T: 16400 Episode Num: 82 Episode T: 200 Reward: -367.591  
 Total T: 16600 Episode Num: 83 Episode T: 200 Reward: -132.511  
 Total T: 16800 Episode Num: 84 Episode T: 200 Reward: -249.579  
 Total T: 17000 Episode Num: 85 Episode T: 200 Reward: -1.406  
 recent Evaluation: -158.22556133795018  
 Total T: 17200 Episode Num: 86 Episode T: 200 Reward: -127.590  
 Total T: 17400 Episode Num: 87 Episode T: 200 Reward: -124.533  
 Total T: 17600 Episode Num: 88 Episode T: 200 Reward: -3.681  
 Total T: 17800 Episode Num: 89 Episode T: 200 Reward: -130.010  
 Total T: 18000 Episode Num: 90 Episode T: 200 Reward: -123.532  
 recent Evaluation: -123.55498818810975  
 Total T: 18200 Episode Num: 91 Episode T: 200 Reward: -118.992  
 Total T: 18400 Episode Num: 92 Episode T: 200 Reward: -129.798  
 Total T: 18600 Episode Num: 93 Episode T: 200 Reward: -128.785

Total T: 18800 Episode Num: 94 Episode T: 200 Reward: -130.139  
Total T: 19000 Episode Num: 95 Episode T: 200 Reward: -131.612  
recent Evaluation: -231.2487357831379  
Total T: 19200 Episode Num: 96 Episode T: 200 Reward: -0.849  
Total T: 19400 Episode Num: 97 Episode T: 200 Reward: -1.373  
Total T: 19600 Episode Num: 98 Episode T: 200 Reward: -652.867  
Total T: 19800 Episode Num: 99 Episode T: 200 Reward: -124.154  
Total T: 20000 Episode Num: 100 Episode T: 200 Reward: -1.238  
recent Evaluation: -168.87394192748087  
Total T: 20200 Episode Num: 101 Episode T: 200 Reward: -902.190  
Total T: 20400 Episode Num: 102 Episode T: 200 Reward: -245.822  
Total T: 20600 Episode Num: 103 Episode T: 200 Reward: -2.256  
Total T: 20800 Episode Num: 104 Episode T: 200 Reward: -2.940  
Total T: 21000 Episode Num: 105 Episode T: 200 Reward: -124.827  
recent Evaluation: -134.15831040018196  
Total T: 21200 Episode Num: 106 Episode T: 200 Reward: -117.966  
Total T: 21400 Episode Num: 107 Episode T: 200 Reward: -222.604  
Total T: 21600 Episode Num: 108 Episode T: 200 Reward: -120.683  
Total T: 21800 Episode Num: 109 Episode T: 200 Reward: -1.377  
Total T: 22000 Episode Num: 110 Episode T: 200 Reward: -234.622  
recent Evaluation: -172.75279977734021  
Total T: 22200 Episode Num: 111 Episode T: 200 Reward: -132.016  
Total T: 22400 Episode Num: 112 Episode T: 200 Reward: -526.563  
Total T: 22600 Episode Num: 113 Episode T: 200 Reward: -332.174  
Total T: 22800 Episode Num: 114 Episode T: 200 Reward: -125.114  
Total T: 23000 Episode Num: 115 Episode T: 200 Reward: -126.065  
recent Evaluation: -200.58610076310384  
Total T: 23200 Episode Num: 116 Episode T: 200 Reward: -117.983  
Total T: 23400 Episode Num: 117 Episode T: 200 Reward: -129.326  
Total T: 23600 Episode Num: 118 Episode T: 200 Reward: -119.752  
Total T: 23800 Episode Num: 119 Episode T: 200 Reward: -371.238  
Total T: 24000 Episode Num: 120 Episode T: 200 Reward: -257.452  
recent Evaluation: -152.46072950982017  
Total T: 24200 Episode Num: 121 Episode T: 200 Reward: -131.688  
Total T: 24400 Episode Num: 122 Episode T: 200 Reward: -118.500  
Total T: 24600 Episode Num: 123 Episode T: 200 Reward: -116.503  
Total T: 24800 Episode Num: 124 Episode T: 200 Reward: -237.122  
Total T: 25000 Episode Num: 125 Episode T: 200 Reward: -385.034  
recent Evaluation: -128.71042934441917  
Total T: 25200 Episode Num: 126 Episode T: 200 Reward: -1.409  
Total T: 25400 Episode Num: 127 Episode T: 200 Reward: -118.598  
Total T: 25600 Episode Num: 128 Episode T: 200 Reward: -251.767  
Total T: 25800 Episode Num: 129 Episode T: 200 Reward: -237.264  
Total T: 26000 Episode Num: 130 Episode T: 200 Reward: -123.701  
recent Evaluation: -101.6345362096988  
Total T: 26200 Episode Num: 131 Episode T: 200 Reward: -2.008  
Total T: 26400 Episode Num: 132 Episode T: 200 Reward: -244.963  
Total T: 26600 Episode Num: 133 Episode T: 200 Reward: -477.106  
Total T: 26800 Episode Num: 134 Episode T: 200 Reward: -255.714  
Total T: 27000 Episode Num: 135 Episode T: 200 Reward: -0.748  
recent Evaluation: -163.24164334141432  
Total T: 27200 Episode Num: 136 Episode T: 200 Reward: -1.315  
Total T: 27400 Episode Num: 137 Episode T: 200 Reward: -402.286  
Total T: 27600 Episode Num: 138 Episode T: 200 Reward: -259.399  
Total T: 27800 Episode Num: 139 Episode T: 200 Reward: -127.084  
Total T: 28000 Episode Num: 140 Episode T: 200 Reward: -258.516  
recent Evaluation: -130.37850415051406  
Total T: 28200 Episode Num: 141 Episode T: 200 Reward: -123.213  
Total T: 28400 Episode Num: 142 Episode T: 200 Reward: -117.172  
Total T: 28600 Episode Num: 143 Episode T: 200 Reward: -128.632  
Total T: 28800 Episode Num: 144 Episode T: 200 Reward: -243.363  
Total T: 29000 Episode Num: 145 Episode T: 200 Reward: -386.857  
recent Evaluation: -138.62753023873378  
Total T: 29200 Episode Num: 146 Episode T: 200 Reward: -347.604  
Total T: 29400 Episode Num: 147 Episode T: 200 Reward: -118.978  
Total T: 29600 Episode Num: 148 Episode T: 200 Reward: -124.860  
Total T: 29800 Episode Num: 149 Episode T: 200 Reward: -348.672  
Total T: 30000 Episode Num: 150 Episode T: 200 Reward: -244.995  
recent Evaluation: -178.06255234489248  
Total T: 30200 Episode Num: 151 Episode T: 200 Reward: -132.945  
Total T: 30400 Episode Num: 152 Episode T: 200 Reward: -128.928  
Total T: 30600 Episode Num: 153 Episode T: 200 Reward: -372.915  
Total T: 30800 Episode Num: 154 Episode T: 200 Reward: -132.000  
Total T: 31000 Episode Num: 155 Episode T: 200 Reward: -0.856  
recent Evaluation: -162.00467366269677  
Total T: 31200 Episode Num: 156 Episode T: 200 Reward: -128.284  
Total T: 31400 Episode Num: 157 Episode T: 200 Reward: -570.892  
Total T: 31600 Episode Num: 158 Episode T: 200 Reward: -122.759  
Total T: 31800 Episode Num: 159 Episode T: 200 Reward: -1.129  
Total T: 32000 Episode Num: 160 Episode T: 200 Reward: -492.256  
recent Evaluation: -224.0676516858602  
Total T: 32200 Episode Num: 161 Episode T: 200 Reward: -126.650  
Total T: 32400 Episode Num: 162 Episode T: 200 Reward: -242.846  
Total T: 32600 Episode Num: 163 Episode T: 200 Reward: -408.200  
Total T: 32800 Episode Num: 164 Episode T: 200 Reward: -259.137  
Total T: 33000 Episode Num: 165 Episode T: 200 Reward: -117.145  
recent Evaluation: -161.63118235858087  
Total T: 33200 Episode Num: 166 Episode T: 200 Reward: -123.562  
Total T: 33400 Episode Num: 167 Episode T: 200 Reward: -352.279  
Total T: 33600 Episode Num: 168 Episode T: 200 Reward: -253.778  
Total T: 33800 Episode Num: 169 Episode T: 200 Reward: -114.991  
Total T: 34000 Episode Num: 170 Episode T: 200 Reward: -122.442  
recent Evaluation: -184.54212102214348  
Total T: 34200 Episode Num: 171 Episode T: 200 Reward: -121.564  
Total T: 34400 Episode Num: 172 Episode T: 200 Reward: -123.066  
Total T: 34600 Episode Num: 173 Episode T: 200 Reward: -1.193  
Total T: 34800 Episode Num: 174 Episode T: 200 Reward: -126.673  
Total T: 35000 Episode Num: 175 Episode T: 200 Reward: -353.528  
recent Evaluation: -182.47032044544105  
Total T: 35200 Episode Num: 176 Episode T: 200 Reward: -241.422  
Total T: 35400 Episode Num: 177 Episode T: 200 Reward: -248.423  
Total T: 35600 Episode Num: 178 Episode T: 200 Reward: -1.042  
Total T: 35800 Episode Num: 179 Episode T: 200 Reward: -131.174  
Total T: 36000 Episode Num: 180 Episode T: 200 Reward: -120.602  
recent Evaluation: -151.56596108021404  
Total T: 36200 Episode Num: 181 Episode T: 200 Reward: -255.915  
Total T: 36400 Episode Num: 182 Episode T: 200 Reward: -124.925  
Total T: 36600 Episode Num: 183 Episode T: 200 Reward: -123.504  
Total T: 36800 Episode Num: 184 Episode T: 200 Reward: -1.895  
Total T: 37000 Episode Num: 185 Episode T: 200 Reward: -117.559  
recent Evaluation: -125.27089722528675  
Total T: 37200 Episode Num: 186 Episode T: 200 Reward: -243.053  
Total T: 37400 Episode Num: 187 Episode T: 200 Reward: -127.937  
Total T: 37600 Episode Num: 188 Episode T: 200 Reward: -121.025  
Total T: 37800 Episode Num: 189 Episode T: 200 Reward: -124.767  
Total T: 38000 Episode Num: 190 Episode T: 200 Reward: -251.149

recent Evaluation: -99.94926450635953  
Total T: 38200 Episode Num: 191 Episode T: 200 Reward: -127.309  
Total T: 38400 Episode Num: 192 Episode T: 200 Reward: -127.404  
Total T: 38600 Episode Num: 193 Episode T: 200 Reward: -246.415  
Total T: 38800 Episode Num: 194 Episode T: 200 Reward: -270.648  
Total T: 39000 Episode Num: 195 Episode T: 200 Reward: -233.708  
recent Evaluation: -162.90131844987886  
Total T: 39200 Episode Num: 196 Episode T: 200 Reward: -131.764  
Total T: 39400 Episode Num: 197 Episode T: 200 Reward: -123.625  
Total T: 39600 Episode Num: 198 Episode T: 200 Reward: -368.368  
Total T: 39800 Episode Num: 199 Episode T: 200 Reward: -127.674  
Total T: 40000 Episode Num: 200 Episode T: 200 Reward: -1.363  
recent Evaluation: -135.6926712868796  
Total T: 40200 Episode Num: 201 Episode T: 200 Reward: -117.051  
Total T: 40400 Episode Num: 202 Episode T: 200 Reward: -248.712  
Total T: 40600 Episode Num: 203 Episode T: 200 Reward: -118.732  
Total T: 40800 Episode Num: 204 Episode T: 200 Reward: -304.985  
Total T: 41000 Episode Num: 205 Episode T: 200 Reward: -259.970  
recent Evaluation: -138.50499713890906  
Total T: 41200 Episode Num: 206 Episode T: 200 Reward: -1.804  
Total T: 41400 Episode Num: 207 Episode T: 200 Reward: -250.679  
Total T: 41600 Episode Num: 208 Episode T: 200 Reward: -1.114  
Total T: 41800 Episode Num: 209 Episode T: 200 Reward: -121.647  
Total T: 42000 Episode Num: 210 Episode T: 200 Reward: -345.578  
recent Evaluation: -111.60723504068976  
Total T: 42200 Episode Num: 211 Episode T: 200 Reward: -1.754  
Total T: 42400 Episode Num: 212 Episode T: 200 Reward: -124.431  
Total T: 42600 Episode Num: 213 Episode T: 200 Reward: -128.283  
Total T: 42800 Episode Num: 214 Episode T: 200 Reward: -132.859  
Total T: 43000 Episode Num: 215 Episode T: 200 Reward: -128.654  
recent Evaluation: -171.2519249704016  
Total T: 43200 Episode Num: 216 Episode T: 200 Reward: -127.792  
Total T: 43400 Episode Num: 217 Episode T: 200 Reward: -122.843  
Total T: 43600 Episode Num: 218 Episode T: 200 Reward: -234.876  
Total T: 43800 Episode Num: 219 Episode T: 200 Reward: -131.661  
Total T: 44000 Episode Num: 220 Episode T: 200 Reward: -130.102  
recent Evaluation: -147.55709248947048  
Total T: 44200 Episode Num: 221 Episode T: 200 Reward: -130.803  
Total T: 44400 Episode Num: 222 Episode T: 200 Reward: -128.646  
Total T: 44600 Episode Num: 223 Episode T: 200 Reward: -124.467  
Total T: 44800 Episode Num: 224 Episode T: 200 Reward: -242.306  
Total T: 45000 Episode Num: 225 Episode T: 200 Reward: -257.423  
recent Evaluation: -150.61530680691388  
Total T: 45200 Episode Num: 226 Episode T: 200 Reward: -390.441  
Total T: 45400 Episode Num: 227 Episode T: 200 Reward: -347.177  
Total T: 45600 Episode Num: 228 Episode T: 200 Reward: -131.168  
Total T: 45800 Episode Num: 229 Episode T: 200 Reward: -128.060  
Total T: 46000 Episode Num: 230 Episode T: 200 Reward: -3.180  
recent Evaluation: -158.19316060308762  
Total T: 46200 Episode Num: 231 Episode T: 200 Reward: -124.105  
Total T: 46400 Episode Num: 232 Episode T: 200 Reward: -243.930  
Total T: 46600 Episode Num: 233 Episode T: 200 Reward: -130.153  
Total T: 46800 Episode Num: 234 Episode T: 200 Reward: -127.795  
Total T: 47000 Episode Num: 235 Episode T: 200 Reward: -128.987  
recent Evaluation: -169.8398706612141  
Total T: 47200 Episode Num: 236 Episode T: 200 Reward: -252.749  
Total T: 47400 Episode Num: 237 Episode T: 200 Reward: -116.656  
Total T: 47600 Episode Num: 238 Episode T: 200 Reward: -248.575  
Total T: 47800 Episode Num: 239 Episode T: 200 Reward: -244.418  
Total T: 48000 Episode Num: 240 Episode T: 200 Reward: -248.065  
recent Evaluation: -135.41702500303106  
Total T: 48200 Episode Num: 241 Episode T: 200 Reward: -115.353  
Total T: 48400 Episode Num: 242 Episode T: 200 Reward: -129.120  
Total T: 48600 Episode Num: 243 Episode T: 200 Reward: -380.446  
Total T: 48800 Episode Num: 244 Episode T: 200 Reward: -239.576  
Total T: 49000 Episode Num: 245 Episode T: 200 Reward: -116.849  
recent Evaluation: -136.48987588398137  
Total T: 49200 Episode Num: 246 Episode T: 200 Reward: -121.599  
Total T: 49400 Episode Num: 247 Episode T: 200 Reward: -121.238  
Total T: 49600 Episode Num: 248 Episode T: 200 Reward: -383.068  
Total T: 49800 Episode Num: 249 Episode T: 200 Reward: -114.176  
Total T: 50000 Episode Num: 250 Episode T: 200 Reward: -133.099  
recent Evaluation: -197.4795505659102  
Total T: 50200 Episode Num: 251 Episode T: 200 Reward: -125.109  
Total T: 50400 Episode Num: 252 Episode T: 200 Reward: -125.429  
Total T: 50600 Episode Num: 253 Episode T: 200 Reward: -129.613  
Total T: 50800 Episode Num: 254 Episode T: 200 Reward: -125.964  
Total T: 51000 Episode Num: 255 Episode T: 200 Reward: -130.142  
recent Evaluation: -186.042663861925  
Total T: 51200 Episode Num: 256 Episode T: 200 Reward: -130.436  
Total T: 51400 Episode Num: 257 Episode T: 200 Reward: -453.875  
Total T: 51600 Episode Num: 258 Episode T: 200 Reward: -126.746  
Total T: 51800 Episode Num: 259 Episode T: 200 Reward: -119.904  
Total T: 52000 Episode Num: 260 Episode T: 200 Reward: -1.464  
recent Evaluation: -125.99853396047656  
Total T: 52200 Episode Num: 261 Episode T: 200 Reward: -127.569  
Total T: 52400 Episode Num: 262 Episode T: 200 Reward: -237.769  
Total T: 52600 Episode Num: 263 Episode T: 200 Reward: -130.288  
Total T: 52800 Episode Num: 264 Episode T: 200 Reward: -359.874  
Total T: 53000 Episode Num: 265 Episode T: 200 Reward: -236.940  
recent Evaluation: -135.18719389436023  
Total T: 53200 Episode Num: 266 Episode T: 200 Reward: -128.247  
Total T: 53400 Episode Num: 267 Episode T: 200 Reward: -234.919  
Total T: 53600 Episode Num: 268 Episode T: 200 Reward: -131.168  
Total T: 53800 Episode Num: 269 Episode T: 200 Reward: -129.994  
Total T: 54000 Episode Num: 270 Episode T: 200 Reward: -132.922  
recent Evaluation: -158.70704047202938  
Total T: 54200 Episode Num: 271 Episode T: 200 Reward: -241.168  
Total T: 54400 Episode Num: 272 Episode T: 200 Reward: -256.675  
Total T: 54600 Episode Num: 273 Episode T: 200 Reward: -358.591  
Total T: 54800 Episode Num: 274 Episode T: 200 Reward: -118.146  
Total T: 55000 Episode Num: 275 Episode T: 200 Reward: -120.645  
recent Evaluation: -159.9250405612493  
Total T: 55200 Episode Num: 276 Episode T: 200 Reward: -132.152  
Total T: 55400 Episode Num: 277 Episode T: 200 Reward: -2.612  
Total T: 55600 Episode Num: 278 Episode T: 200 Reward: -131.279  
Total T: 55800 Episode Num: 279 Episode T: 200 Reward: -372.838  
Total T: 56000 Episode Num: 280 Episode T: 200 Reward: -118.937  
recent Evaluation: -138.86201346282314  
Total T: 56200 Episode Num: 281 Episode T: 200 Reward: -385.708  
Total T: 56400 Episode Num: 282 Episode T: 200 Reward: -344.357  
Total T: 56600 Episode Num: 283 Episode T: 200 Reward: -133.194  
Total T: 56800 Episode Num: 284 Episode T: 200 Reward: -128.185  
Total T: 57000 Episode Num: 285 Episode T: 200 Reward: -123.678  
recent Evaluation: -113.47208722393184  
Total T: 57200 Episode Num: 286 Episode T: 200 Reward: -129.410



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Total T: 57400 Episode Num: 287 Episode T: 200 Reward: -2.016
Total T: 57600 Episode Num: 288 Episode T: 200 Reward: -240.513
Total T: 57800 Episode Num: 289 Episode T: 200 Reward: -121.077
Total T: 58000 Episode Num: 290 Episode T: 200 Reward: -242.463
recent Evaluation: -160.3617040836437
Total T: 58200 Episode Num: 291 Episode T: 200 Reward: -130.391
Total T: 58400 Episode Num: 292 Episode T: 200 Reward: -119.879
Total T: 58600 Episode Num: 293 Episode T: 200 Reward: -127.790
Total T: 58800 Episode Num: 294 Episode T: 200 Reward: -127.439
Total T: 59000 Episode Num: 295 Episode T: 200 Reward: -356.069
recent Evaluation: -150.81782203497846
Total T: 59200 Episode Num: 296 Episode T: 200 Reward: -129.711
Total T: 59400 Episode Num: 297 Episode T: 200 Reward: -132.558
Total T: 59600 Episode Num: 298 Episode T: 200 Reward: -129.937
Total T: 59800 Episode Num: 299 Episode T: 200 Reward: -118.040
Total T: 60000 Episode Num: 300 Episode T: 200 Reward: -126.996
recent Evaluation: -128.5342090502099
Total T: 60200 Episode Num: 301 Episode T: 200 Reward: -367.900
Total T: 60400 Episode Num: 302 Episode T: 200 Reward: -118.731
Total T: 60600 Episode Num: 303 Episode T: 200 Reward: -310.624
Total T: 60800 Episode Num: 304 Episode T: 200 Reward: -245.858
Total T: 61000 Episode Num: 305 Episode T: 200 Reward: -247.301
recent Evaluation: -178.9043992109893
Total T: 61200 Episode Num: 306 Episode T: 200 Reward: -250.768
Total T: 61400 Episode Num: 307 Episode T: 200 Reward: -122.237
Total T: 61600 Episode Num: 308 Episode T: 200 Reward: -125.408
Total T: 61800 Episode Num: 309 Episode T: 200 Reward: -260.890
Total T: 62000 Episode Num: 310 Episode T: 200 Reward: -232.233
recent Evaluation: -181.98410638433634
Total T: 62200 Episode Num: 311 Episode T: 200 Reward: -378.097
Total T: 62400 Episode Num: 312 Episode T: 200 Reward: -253.988
Total T: 62600 Episode Num: 313 Episode T: 200 Reward: -128.613
Total T: 62800 Episode Num: 314 Episode T: 200 Reward: -255.032
Total T: 63000 Episode Num: 315 Episode T: 200 Reward: -121.711
recent Evaluation: -124.41911610135863
Total T: 63200 Episode Num: 316 Episode T: 200 Reward: -243.598
Total T: 63400 Episode Num: 317 Episode T: 200 Reward: -246.529
Total T: 63600 Episode Num: 318 Episode T: 200 Reward: -131.578
Total T: 63800 Episode Num: 319 Episode T: 200 Reward: -125.096
Total T: 64000 Episode Num: 320 Episode T: 200 Reward: -116.500
recent Evaluation: -164.36511046403956
Total T: 64200 Episode Num: 321 Episode T: 200 Reward: -252.240
Total T: 64400 Episode Num: 322 Episode T: 200 Reward: -131.912
Total T: 64600 Episode Num: 323 Episode T: 200 Reward: -238.794
Total T: 64800 Episode Num: 324 Episode T: 200 Reward: -126.533
Total T: 65000 Episode Num: 325 Episode T: 200 Reward: -252.362
recent Evaluation: -161.7444430916127
Total T: 65200 Episode Num: 326 Episode T: 200 Reward: -238.658
Total T: 65400 Episode Num: 327 Episode T: 200 Reward: -2.182
Total T: 65600 Episode Num: 328 Episode T: 200 Reward: -132.986
Total T: 65800 Episode Num: 329 Episode T: 200 Reward: -129.891
Total T: 66000 Episode Num: 330 Episode T: 200 Reward: -124.871
recent Evaluation: -150.0762096475629
Total T: 66200 Episode Num: 331 Episode T: 200 Reward: -121.756
Total T: 66400 Episode Num: 332 Episode T: 200 Reward: -127.530
Total T: 66600 Episode Num: 333 Episode T: 200 Reward: -355.562
Total T: 66800 Episode Num: 334 Episode T: 200 Reward: -129.250
Total T: 67000 Episode Num: 335 Episode T: 200 Reward: -2.904
recent Evaluation: -122.79225879436947
Total T: 67200 Episode Num: 336 Episode T: 200 Reward: -123.954
Total T: 67400 Episode Num: 337 Episode T: 200 Reward: -248.912
Total T: 67600 Episode Num: 338 Episode T: 200 Reward: -129.413
Total T: 67800 Episode Num: 339 Episode T: 200 Reward: -1.935
Total T: 68000 Episode Num: 340 Episode T: 200 Reward: -120.885
recent Evaluation: -180.74934506461577
Total T: 68200 Episode Num: 341 Episode T: 200 Reward: -126.976
Total T: 68400 Episode Num: 342 Episode T: 200 Reward: -120.283
Total T: 68600 Episode Num: 343 Episode T: 200 Reward: -121.212
Total T: 68800 Episode Num: 344 Episode T: 200 Reward: -269.033
Total T: 69000 Episode Num: 345 Episode T: 200 Reward: -125.554
recent Evaluation: -138.3446373206568
Total T: 69200 Episode Num: 346 Episode T: 200 Reward: -248.158
Total T: 69400 Episode Num: 347 Episode T: 200 Reward: -129.620
Total T: 69600 Episode Num: 348 Episode T: 200 Reward: -1.253
Total T: 69800 Episode Num: 349 Episode T: 200 Reward: -128.783
Total T: 70000 Episode Num: 350 Episode T: 200 Reward: -121.520
recent Evaluation: -168.11641236704662
Total T: 70200 Episode Num: 351 Episode T: 200 Reward: -123.155
Total T: 70400 Episode Num: 352 Episode T: 200 Reward: -348.060
Total T: 70600 Episode Num: 353 Episode T: 200 Reward: -130.128
Total T: 70800 Episode Num: 354 Episode T: 200 Reward: -133.895
Total T: 71000 Episode Num: 355 Episode T: 200 Reward: -253.818
recent Evaluation: -160.0738248029586
Total T: 71200 Episode Num: 356 Episode T: 200 Reward: -376.938
Total T: 71400 Episode Num: 357 Episode T: 200 Reward: -128.798
Total T: 71600 Episode Num: 358 Episode T: 200 Reward: -118.947
Total T: 71800 Episode Num: 359 Episode T: 200 Reward: -373.024
Total T: 72000 Episode Num: 360 Episode T: 200 Reward: -120.807
recent Evaluation: -125.8719686618482
Total T: 72200 Episode Num: 361 Episode T: 200 Reward: -127.950
Total T: 72400 Episode Num: 362 Episode T: 200 Reward: -246.430
Total T: 72600 Episode Num: 363 Episode T: 200 Reward: -122.164
Total T: 72800 Episode Num: 364 Episode T: 200 Reward: -357.246
Total T: 73000 Episode Num: 365 Episode T: 200 Reward: -2.129
recent Evaluation: -113.18486046060248
Total T: 73200 Episode Num: 366 Episode T: 200 Reward: -130.141
Total T: 73400 Episode Num: 367 Episode T: 200 Reward: -131.461
Total T: 73600 Episode Num: 368 Episode T: 200 Reward: -134.037
Total T: 73800 Episode Num: 369 Episode T: 200 Reward: -129.568
Total T: 74000 Episode Num: 370 Episode T: 200 Reward: -126.912
recent Evaluation: -136.44997914601282
Total T: 74200 Episode Num: 371 Episode T: 200 Reward: -119.236
Total T: 74400 Episode Num: 372 Episode T: 200 Reward: -251.989
Total T: 74600 Episode Num: 373 Episode T: 200 Reward: -236.593
Total T: 74800 Episode Num: 374 Episode T: 200 Reward: -129.518
Total T: 75000 Episode Num: 375 Episode T: 200 Reward: -128.252
recent Evaluation: -124.5697236211225
Total T: 75200 Episode Num: 376 Episode T: 200 Reward: -240.705
Total T: 75400 Episode Num: 377 Episode T: 200 Reward: -124.611
Total T: 75600 Episode Num: 378 Episode T: 200 Reward: -356.953
Total T: 75800 Episode Num: 379 Episode T: 200 Reward: -363.988
Total T: 76000 Episode Num: 380 Episode T: 200 Reward: -127.758
recent Evaluation: -181.21385213376487
Total T: 76200 Episode Num: 381 Episode T: 200 Reward: -252.599
Total T: 76400 Episode Num: 382 Episode T: 200 Reward: -253.615
Total T: 76600 Episode Num: 383 Episode T: 200 Reward: -2.048

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Total T: 76800 Episode Num: 384 Episode T: 200 Reward: -2.996
Total T: 77000 Episode Num: 385 Episode T: 200 Reward: -242.088
recent Evaluation: -129.7485820038765
Total T: 77200 Episode Num: 386 Episode T: 200 Reward: -126.400
Total T: 77400 Episode Num: 387 Episode T: 200 Reward: -2.522
Total T: 77600 Episode Num: 388 Episode T: 200 Reward: -397.557
Total T: 77800 Episode Num: 389 Episode T: 200 Reward: -287.939
Total T: 78000 Episode Num: 390 Episode T: 200 Reward: -247.636
recent Evaluation: -139.2002188874193
Total T: 78200 Episode Num: 391 Episode T: 200 Reward: -131.728
Total T: 78400 Episode Num: 392 Episode T: 200 Reward: -129.640
Total T: 78600 Episode Num: 393 Episode T: 200 Reward: -249.557
Total T: 78800 Episode Num: 394 Episode T: 200 Reward: -229.560
Total T: 79000 Episode Num: 395 Episode T: 200 Reward: -126.663
recent Evaluation: -137.7898063305635
Total T: 79200 Episode Num: 396 Episode T: 200 Reward: -116.792
Total T: 79400 Episode Num: 397 Episode T: 200 Reward: -257.750
Total T: 79600 Episode Num: 398 Episode T: 200 Reward: -248.001
Total T: 79800 Episode Num: 399 Episode T: 200 Reward: -128.866
Total T: 80000 Episode Num: 400 Episode T: 200 Reward: -375.126
recent Evaluation: -175.5265259533872
Total T: 80200 Episode Num: 401 Episode T: 200 Reward: -130.656
Total T: 80400 Episode Num: 402 Episode T: 200 Reward: -238.495
Total T: 80600 Episode Num: 403 Episode T: 200 Reward: -132.315
Total T: 80800 Episode Num: 404 Episode T: 200 Reward: -2.572
Total T: 81000 Episode Num: 405 Episode T: 200 Reward: -125.440
recent Evaluation: -127.35148631702705
Total T: 81200 Episode Num: 406 Episode T: 200 Reward: -2.719
Total T: 81400 Episode Num: 407 Episode T: 200 Reward: -414.982
Total T: 81600 Episode Num: 408 Episode T: 200 Reward: -2.628
Total T: 81800 Episode Num: 409 Episode T: 200 Reward: -128.966
Total T: 82000 Episode Num: 410 Episode T: 200 Reward: -3.621
recent Evaluation: -159.97189458146045
Total T: 82200 Episode Num: 411 Episode T: 200 Reward: -121.349
Total T: 82400 Episode Num: 412 Episode T: 200 Reward: -121.598
Total T: 82600 Episode Num: 413 Episode T: 200 Reward: -247.526
Total T: 82800 Episode Num: 414 Episode T: 200 Reward: -1.399
Total T: 83000 Episode Num: 415 Episode T: 200 Reward: -130.029
recent Evaluation: -134.74918059753307
Total T: 83200 Episode Num: 416 Episode T: 200 Reward: -248.829
Total T: 83400 Episode Num: 417 Episode T: 200 Reward: -133.594
Total T: 83600 Episode Num: 418 Episode T: 200 Reward: -117.779
Total T: 83800 Episode Num: 419 Episode T: 200 Reward: -246.649
Total T: 84000 Episode Num: 420 Episode T: 200 Reward: -378.865
recent Evaluation: -163.27505035958802
Total T: 84200 Episode Num: 421 Episode T: 200 Reward: -241.314
Total T: 84400 Episode Num: 422 Episode T: 200 Reward: -133.118
Total T: 84600 Episode Num: 423 Episode T: 200 Reward: -131.582
Total T: 84800 Episode Num: 424 Episode T: 200 Reward: -3.005
Total T: 85000 Episode Num: 425 Episode T: 200 Reward: -243.645
recent Evaluation: -135.38383487983407
Total T: 85200 Episode Num: 426 Episode T: 200 Reward: -242.339
Total T: 85400 Episode Num: 427 Episode T: 200 Reward: -119.734
Total T: 85600 Episode Num: 428 Episode T: 200 Reward: -373.644
Total T: 85800 Episode Num: 429 Episode T: 200 Reward: -116.989
Total T: 86000 Episode Num: 430 Episode T: 200 Reward: -135.046
recent Evaluation: -197.4704798442089
Total T: 86200 Episode Num: 431 Episode T: 200 Reward: -2.151
Total T: 86400 Episode Num: 432 Episode T: 200 Reward: -384.585
Total T: 86600 Episode Num: 433 Episode T: 200 Reward: -243.409
Total T: 86800 Episode Num: 434 Episode T: 200 Reward: -355.339
Total T: 87000 Episode Num: 435 Episode T: 200 Reward: -117.524
recent Evaluation: -135.51634436176087
Total T: 87200 Episode Num: 436 Episode T: 200 Reward: -118.270
Total T: 87400 Episode Num: 437 Episode T: 200 Reward: -120.496
Total T: 87600 Episode Num: 438 Episode T: 200 Reward: -3.132
Total T: 87800 Episode Num: 439 Episode T: 200 Reward: -117.523
Total T: 88000 Episode Num: 440 Episode T: 200 Reward: -372.928
recent Evaluation: -130.07151856554802
Total T: 88200 Episode Num: 441 Episode T: 200 Reward: -117.452
Total T: 88400 Episode Num: 442 Episode T: 200 Reward: -131.201
Total T: 88600 Episode Num: 443 Episode T: 200 Reward: -256.830
Total T: 88800 Episode Num: 444 Episode T: 200 Reward: -248.279
Total T: 89000 Episode Num: 445 Episode T: 200 Reward: -126.108
recent Evaluation: -170.4297757591352
Total T: 89200 Episode Num: 446 Episode T: 200 Reward: -129.569
Total T: 89400 Episode Num: 447 Episode T: 200 Reward: -2.984
Total T: 89600 Episode Num: 448 Episode T: 200 Reward: -1.997
Total T: 89800 Episode Num: 449 Episode T: 200 Reward: -118.872
Total T: 90000 Episode Num: 450 Episode T: 200 Reward: -266.050
recent Evaluation: -176.1989616969857
Total T: 90200 Episode Num: 451 Episode T: 200 Reward: -247.641
Total T: 90400 Episode Num: 452 Episode T: 200 Reward: -232.773
Total T: 90600 Episode Num: 453 Episode T: 200 Reward: -128.652
Total T: 90800 Episode Num: 454 Episode T: 200 Reward: -123.061
Total T: 91000 Episode Num: 455 Episode T: 200 Reward: -132.621
recent Evaluation: -133.25544453418678
Total T: 91200 Episode Num: 456 Episode T: 200 Reward: -118.740
Total T: 91400 Episode Num: 457 Episode T: 200 Reward: -351.248
Total T: 91600 Episode Num: 458 Episode T: 200 Reward: -129.979
Total T: 91800 Episode Num: 459 Episode T: 200 Reward: -248.169
Total T: 92000 Episode Num: 460 Episode T: 200 Reward: -124.228
recent Evaluation: -139.27532572467243
Total T: 92200 Episode Num: 461 Episode T: 200 Reward: -125.349
Total T: 92400 Episode Num: 462 Episode T: 200 Reward: -130.013
Total T: 92600 Episode Num: 463 Episode T: 200 Reward: -3.842
Total T: 92800 Episode Num: 464 Episode T: 200 Reward: -130.072
Total T: 93000 Episode Num: 465 Episode T: 200 Reward: -351.762
recent Evaluation: -169.24164389583552
Total T: 93200 Episode Num: 466 Episode T: 200 Reward: -241.447
Total T: 93400 Episode Num: 467 Episode T: 200 Reward: -241.950
Total T: 93600 Episode Num: 468 Episode T: 200 Reward: -126.648
Total T: 93800 Episode Num: 469 Episode T: 200 Reward: -2.137
Total T: 94000 Episode Num: 470 Episode T: 200 Reward: -247.037
recent Evaluation: -170.47218970410563
Total T: 94200 Episode Num: 471 Episode T: 200 Reward: -123.464
Total T: 94400 Episode Num: 472 Episode T: 200 Reward: -375.456
Total T: 94600 Episode Num: 473 Episode T: 200 Reward: -134.711
Total T: 94800 Episode Num: 474 Episode T: 200 Reward: -126.461
Total T: 95000 Episode Num: 475 Episode T: 200 Reward: -245.581
recent Evaluation: -174.71240899393015
Total T: 95200 Episode Num: 476 Episode T: 200 Reward: -7.239
Total T: 95400 Episode Num: 477 Episode T: 200 Reward: -239.155
Total T: 95600 Episode Num: 478 Episode T: 200 Reward: -248.278
Total T: 95800 Episode Num: 479 Episode T: 200 Reward: -122.352
Total T: 96000 Episode Num: 480 Episode T: 200 Reward: -1.840

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recent Evaluation: -191.64074392778372
Total T: 96200 Episode Num: 481 Episode T: 200 Reward: -116.100
Total T: 96400 Episode Num: 482 Episode T: 200 Reward: -119.753
Total T: 96600 Episode Num: 483 Episode T: 200 Reward: -339.069
Total T: 96800 Episode Num: 484 Episode T: 200 Reward: -123.284
Total T: 97000 Episode Num: 485 Episode T: 200 Reward: -350.289
recent Evaluation: -196.56020099396287
Total T: 97200 Episode Num: 486 Episode T: 200 Reward: -128.664
Total T: 97400 Episode Num: 487 Episode T: 200 Reward: -121.024
Total T: 97600 Episode Num: 488 Episode T: 200 Reward: -240.108
Total T: 97800 Episode Num: 489 Episode T: 200 Reward: -3.174
Total T: 98000 Episode Num: 490 Episode T: 200 Reward: -124.992
recent Evaluation: -136.25729773428608
Total T: 98200 Episode Num: 491 Episode T: 200 Reward: -372.316
Total T: 98400 Episode Num: 492 Episode T: 200 Reward: -128.796
Total T: 98600 Episode Num: 493 Episode T: 200 Reward: -130.737
Total T: 98800 Episode Num: 494 Episode T: 200 Reward: -120.038
Total T: 99000 Episode Num: 495 Episode T: 200 Reward: -132.141
recent Evaluation: -130.16324301752076
Total T: 99200 Episode Num: 496 Episode T: 200 Reward: -131.718
Total T: 99400 Episode Num: 497 Episode T: 200 Reward: -130.312

```

In [10...

# The following scripts run the TD3 algorithm.

```

alias = 'td3'

import matplotlib.pyplot as plt
import numpy as np
import torch
import gym
import argparse
import os
import torch.nn.functional as F
import utils
import TD3
import DDPG

def eval_policy(policy, eval_episodes=10):
    eval_env = gym.make(ENV_NAME)

    avg_reward = 0.
    for _ in range(eval_episodes):
        state, done = eval_env.reset(), False
        while not done:
            action = policy.select_action(np.array(state))
            state, reward, done, _ = eval_env.step(action)
            avg_reward += reward

        avg_reward /= eval_episodes
    #print("-----")
    #print(f"Evaluation over {eval_episodes} episodes: {avg_reward:.3f}")
    #print("-----")
    return avg_reward

env = gym.make(ENV_NAME)
torch.manual_seed(0)
np.random.seed(0)

state_dim = env.observation_space.shape[0]
action_dim = env.action_space.shape[0]
max_action = env.action_space.high[0]

args_policy_noise = 0.2
args_noise_clip = 0.5
args_policy_freq = 2
args_max_timesteps = 100000
args_expl_noise = 0.1
args_batch_size = 25
args_eval_freq = 1000
args_start_timesteps = 0

kwargs = {
    "state_dim": state_dim,
    "action_dim": action_dim,
    "max_action": max_action,
    "discount": 0.99,
    "tau": 0.005
}

args_policy = 'TD3'

if args_policy == "TD3":
    # Target policy smoothing is scaled wrt the action scale
    kwargs["policy_noise"] = args_policy_noise * max_action
    kwargs["noise_clip"] = args_noise_clip * max_action
    kwargs["policy_freq"] = args_policy_freq
    policy = TD3.TD3(**kwargs)
elif args_policy == "OurDDPG":
    policy = OurDDPG.DDPG(**kwargs)
elif args_policy == "DDPG":
    policy = DDPG.DDPG(**kwargs)
replay_buffer = utils.ReplayBuffer(state_dim, action_dim)

# Evaluate untrained policy
evaluations = [eval_policy(policy)]

state, done = env.reset(), False
episode_reward = 0
episode_timesteps = 0
episode_num = 0
counter = 0
msk_list = []
temp_curve = [eval_policy(policy)]
temp_val = []
for t in range(int(args_max_timesteps)):
    episode_timesteps += 1
    counter += 1
    # Select action randomly or according to policy
    if t < args_start_timesteps:
        action = np.random.uniform(-max_action, max_action, action_dim)
    else:
        # ε-greedy strategy
        if np.random.uniform(0,1) < 0.1:

```

```

        action = np.random.uniform(-max_action, max_action, action_dim)
    else:
        action = (
            policy.select_action(np.array(state))
            + np.random.normal(0, max_action * args_expl_noise, size=action_dim)
        ).clip(-max_action, max_action)

    # Perform action
    next_state, reward, done, _ = env.step(action)
    done_bool = float(done) if episode_timesteps < env._max_episode_steps else 0

    replay_buffer.add(state, action, next_state, reward, done_bool)

    state = next_state
    episode_reward += reward

    if t >= args_start_timesteps:
        '''TD3'''
        last_val = 999.
        patient = 5
        for i in range(1):
            policy.train(replay_buffer, args_batch_size)

    # Train agent after collecting sufficient data
    if done:
        print(f"Total T: {t+1} Episode Num: {episode_num+1} Episode T: {episode_timesteps} Reward: {episode_reward:.3f}")
        msk_list = []
        state, done = env.reset(), False
        episode_reward = 0
        episode_timesteps = 0
        episode_num += 1

    # Evaluate episode
    if (t + 1) % args_eval_freq == 0:
        evaluations.append(eval_policy(policy))
        print('recent Evaluation:', evaluations[-1])
        np.save('results/evaluations_alias{}_ENV{}'.format(alias, ENV_NAME), evaluations)
Total T: 200 Episode Num: 1 Episode T: 200 Reward: -1223.456
Total T: 400 Episode Num: 2 Episode T: 200 Reward: -1323.051
Total T: 600 Episode Num: 3 Episode T: 200 Reward: -1732.410
Total T: 800 Episode Num: 4 Episode T: 200 Reward: -1748.495
Total T: 1000 Episode Num: 5 Episode T: 200 Reward: -1654.148
recent Evaluation: -1750.8525255207642
Total T: 1200 Episode Num: 6 Episode T: 200 Reward: -1613.912
Total T: 1400 Episode Num: 7 Episode T: 200 Reward: -1676.561
Total T: 1600 Episode Num: 8 Episode T: 200 Reward: -1600.636
Total T: 1800 Episode Num: 9 Episode T: 200 Reward: -1634.766
Total T: 2000 Episode Num: 10 Episode T: 200 Reward: -1612.565
recent Evaluation: -1531.8499479355567
Total T: 2200 Episode Num: 11 Episode T: 200 Reward: -1578.314
Total T: 2400 Episode Num: 12 Episode T: 200 Reward: -1626.842
Total T: 2600 Episode Num: 13 Episode T: 200 Reward: -1592.122
Total T: 2800 Episode Num: 14 Episode T: 200 Reward: -1436.336
Total T: 3000 Episode Num: 15 Episode T: 200 Reward: -1357.258
recent Evaluation: -1392.9221434994042
Total T: 3200 Episode Num: 16 Episode T: 200 Reward: -1438.597
Total T: 3400 Episode Num: 17 Episode T: 200 Reward: -1397.428
Total T: 3600 Episode Num: 18 Episode T: 200 Reward: -1366.837
Total T: 3800 Episode Num: 19 Episode T: 200 Reward: -1254.436
Total T: 4000 Episode Num: 20 Episode T: 200 Reward: -1294.627
recent Evaluation: -1258.5976970131221
Total T: 4200 Episode Num: 21 Episode T: 200 Reward: -1058.773
Total T: 4400 Episode Num: 22 Episode T: 200 Reward: -1204.238
Total T: 4600 Episode Num: 23 Episode T: 200 Reward: -1205.942
Total T: 4800 Episode Num: 24 Episode T: 200 Reward: -1115.711
Total T: 5000 Episode Num: 25 Episode T: 200 Reward: -1140.826
recent Evaluation: -980.7500888366931
Total T: 5200 Episode Num: 26 Episode T: 200 Reward: -983.770
Total T: 5400 Episode Num: 27 Episode T: 200 Reward: -758.279
Total T: 5600 Episode Num: 28 Episode T: 200 Reward: -887.967
Total T: 5800 Episode Num: 29 Episode T: 200 Reward: -889.148
Total T: 6000 Episode Num: 30 Episode T: 200 Reward: -1215.193
recent Evaluation: -1196.6293684875272
Total T: 6200 Episode Num: 31 Episode T: 200 Reward: -936.119
Total T: 6400 Episode Num: 32 Episode T: 200 Reward: -1047.539
Total T: 6600 Episode Num: 33 Episode T: 200 Reward: -921.498
Total T: 6800 Episode Num: 34 Episode T: 200 Reward: -1084.755
Total T: 7000 Episode Num: 35 Episode T: 200 Reward: -906.634
recent Evaluation: -1024.184709530578
Total T: 7200 Episode Num: 36 Episode T: 200 Reward: -1012.462
Total T: 7400 Episode Num: 37 Episode T: 200 Reward: -834.992
Total T: 7600 Episode Num: 38 Episode T: 200 Reward: -911.117
Total T: 7800 Episode Num: 39 Episode T: 200 Reward: -1053.936
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recent Evaluation: -141.7767953706144
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recent Evaluation: -172.33594853005826

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recent Evaluation: -180.88055734593382

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Total T: 71200 Episode Num: 356 Episode T: 200 Reward: -118.440
Total T: 71400 Episode Num: 357 Episode T: 200 Reward: -233.856
Total T: 71600 Episode Num: 358 Episode T: 200 Reward: -124.511
Total T: 71800 Episode Num: 359 Episode T: 200 Reward: -121.013
Total T: 72000 Episode Num: 360 Episode T: 200 Reward: -120.702
recent Evaluation: -166.31453851869242
Total T: 72200 Episode Num: 361 Episode T: 200 Reward: -233.712
Total T: 72400 Episode Num: 362 Episode T: 200 Reward: -252.411
Total T: 72600 Episode Num: 363 Episode T: 200 Reward: -123.692
Total T: 72800 Episode Num: 364 Episode T: 200 Reward: -122.142
Total T: 73000 Episode Num: 365 Episode T: 200 Reward: -1.540
recent Evaluation: -123.08087018943554
Total T: 73200 Episode Num: 366 Episode T: 200 Reward: -389.757
Total T: 73400 Episode Num: 367 Episode T: 200 Reward: -236.247
Total T: 73600 Episode Num: 368 Episode T: 200 Reward: -119.460
Total T: 73800 Episode Num: 369 Episode T: 200 Reward: -253.172
Total T: 74000 Episode Num: 370 Episode T: 200 Reward: -124.908
recent Evaluation: -107.08077400023781
Total T: 74200 Episode Num: 371 Episode T: 200 Reward: -2.310
Total T: 74400 Episode Num: 372 Episode T: 200 Reward: -115.409
Total T: 74600 Episode Num: 373 Episode T: 200 Reward: -121.328
Total T: 74800 Episode Num: 374 Episode T: 200 Reward: -118.854
Total T: 75000 Episode Num: 375 Episode T: 200 Reward: -1.087
recent Evaluation: -123.39508428076677
Total T: 75200 Episode Num: 376 Episode T: 200 Reward: -119.296
Total T: 75400 Episode Num: 377 Episode T: 200 Reward: -0.788
Total T: 75600 Episode Num: 378 Episode T: 200 Reward: -125.540
Total T: 75800 Episode Num: 379 Episode T: 200 Reward: -390.824
Total T: 76000 Episode Num: 380 Episode T: 200 Reward: -375.683
recent Evaluation: -156.6064833780373
Total T: 76200 Episode Num: 381 Episode T: 200 Reward: -0.375
Total T: 76400 Episode Num: 382 Episode T: 200 Reward: -245.032
Total T: 76600 Episode Num: 383 Episode T: 200 Reward: -114.547
Total T: 76800 Episode Num: 384 Episode T: 200 Reward: -245.716
Total T: 77000 Episode Num: 385 Episode T: 200 Reward: -125.003
recent Evaluation: -144.09958204795575
Total T: 77200 Episode Num: 386 Episode T: 200 Reward: -0.420
Total T: 77400 Episode Num: 387 Episode T: 200 Reward: -116.584
Total T: 77600 Episode Num: 388 Episode T: 200 Reward: -118.879
Total T: 77800 Episode Num: 389 Episode T: 200 Reward: -355.666
Total T: 78000 Episode Num: 390 Episode T: 200 Reward: -117.511
recent Evaluation: -173.16655916673184
Total T: 78200 Episode Num: 391 Episode T: 200 Reward: -122.008
Total T: 78400 Episode Num: 392 Episode T: 200 Reward: -126.478
Total T: 78600 Episode Num: 393 Episode T: 200 Reward: -118.922
Total T: 78800 Episode Num: 394 Episode T: 200 Reward: -0.967
Total T: 79000 Episode Num: 395 Episode T: 200 Reward: -375.916
recent Evaluation: -167.94444463964277
Total T: 79200 Episode Num: 396 Episode T: 200 Reward: -239.961
Total T: 79400 Episode Num: 397 Episode T: 200 Reward: -231.751
Total T: 79600 Episode Num: 398 Episode T: 200 Reward: -118.622
Total T: 79800 Episode Num: 399 Episode T: 200 Reward: -322.283
Total T: 80000 Episode Num: 400 Episode T: 200 Reward: -356.673
recent Evaluation: -120.38322891541259
Total T: 80200 Episode Num: 401 Episode T: 200 Reward: -240.982
Total T: 80400 Episode Num: 402 Episode T: 200 Reward: -120.335
Total T: 80600 Episode Num: 403 Episode T: 200 Reward: -116.782
Total T: 80800 Episode Num: 404 Episode T: 200 Reward: -239.464
Total T: 81000 Episode Num: 405 Episode T: 200 Reward: -125.968
recent Evaluation: -180.39698651856102
Total T: 81200 Episode Num: 406 Episode T: 200 Reward: -0.484
Total T: 81400 Episode Num: 407 Episode T: 200 Reward: -358.513
Total T: 81600 Episode Num: 408 Episode T: 200 Reward: -249.633
Total T: 81800 Episode Num: 409 Episode T: 200 Reward: -0.904
Total T: 82000 Episode Num: 410 Episode T: 200 Reward: -117.256
recent Evaluation: -129.9741415644385
Total T: 82200 Episode Num: 411 Episode T: 200 Reward: -118.870
Total T: 82400 Episode Num: 412 Episode T: 200 Reward: -237.535
Total T: 82600 Episode Num: 413 Episode T: 200 Reward: -244.668
Total T: 82800 Episode Num: 414 Episode T: 200 Reward: -125.967
Total T: 83000 Episode Num: 415 Episode T: 200 Reward: -125.180
recent Evaluation: -148.3886061194474
Total T: 83200 Episode Num: 416 Episode T: 200 Reward: -124.647
Total T: 83400 Episode Num: 417 Episode T: 200 Reward: -126.889
Total T: 83600 Episode Num: 418 Episode T: 200 Reward: -253.720
Total T: 83800 Episode Num: 419 Episode T: 200 Reward: -253.242
Total T: 84000 Episode Num: 420 Episode T: 200 Reward: -126.183
recent Evaluation: -123.99648812829291
Total T: 84200 Episode Num: 421 Episode T: 200 Reward: -247.364
Total T: 84400 Episode Num: 422 Episode T: 200 Reward: -238.283
Total T: 84600 Episode Num: 423 Episode T: 200 Reward: -243.098
Total T: 84800 Episode Num: 424 Episode T: 200 Reward: -128.741
Total T: 85000 Episode Num: 425 Episode T: 200 Reward: -233.468
recent Evaluation: -108.41444670978055
Total T: 85200 Episode Num: 426 Episode T: 200 Reward: -124.849
Total T: 85400 Episode Num: 427 Episode T: 200 Reward: -240.323
Total T: 85600 Episode Num: 428 Episode T: 200 Reward: -239.657
Total T: 85800 Episode Num: 429 Episode T: 200 Reward: -230.658
Total T: 86000 Episode Num: 430 Episode T: 200 Reward: -118.851
recent Evaluation: -131.7629676928459
Total T: 86200 Episode Num: 431 Episode T: 200 Reward: -364.245
Total T: 86400 Episode Num: 432 Episode T: 200 Reward: -122.503
Total T: 86600 Episode Num: 433 Episode T: 200 Reward: -229.734
Total T: 86800 Episode Num: 434 Episode T: 200 Reward: -372.717
Total T: 87000 Episode Num: 435 Episode T: 200 Reward: -117.685
recent Evaluation: -181.22173294072485
Total T: 87200 Episode Num: 436 Episode T: 200 Reward: -0.500
Total T: 87400 Episode Num: 437 Episode T: 200 Reward: -120.394
Total T: 87600 Episode Num: 438 Episode T: 200 Reward: -0.874
Total T: 87800 Episode Num: 439 Episode T: 200 Reward: -234.573
Total T: 88000 Episode Num: 440 Episode T: 200 Reward: -120.998
recent Evaluation: -109.46888724332582
Total T: 88200 Episode Num: 441 Episode T: 200 Reward: -116.581
Total T: 88400 Episode Num: 442 Episode T: 200 Reward: -117.611
Total T: 88600 Episode Num: 443 Episode T: 200 Reward: -118.550
Total T: 88800 Episode Num: 444 Episode T: 200 Reward: -250.670
Total T: 89000 Episode Num: 445 Episode T: 200 Reward: -125.562
recent Evaluation: -200.5443162309104
Total T: 89200 Episode Num: 446 Episode T: 200 Reward: -114.256
Total T: 89400 Episode Num: 447 Episode T: 200 Reward: -125.773
Total T: 89600 Episode Num: 448 Episode T: 200 Reward: -126.891
Total T: 89800 Episode Num: 449 Episode T: 200 Reward: -121.849
Total T: 90000 Episode Num: 450 Episode T: 200 Reward: -126.713
recent Evaluation: -149.52842865459652
Total T: 90200 Episode Num: 451 Episode T: 200 Reward: -235.891
Total T: 90400 Episode Num: 452 Episode T: 200 Reward: -122.503

```



```

Total T: 90600 Episode Num: 453 Episode T: 200 Reward: -117.999
Total T: 90800 Episode Num: 454 Episode T: 200 Reward: -236.706
Total T: 91000 Episode Num: 455 Episode T: 200 Reward: -125.802
recent Evaluation: -170.5663510899988
Total T: 91200 Episode Num: 456 Episode T: 200 Reward: -127.411
Total T: 91400 Episode Num: 457 Episode T: 200 Reward: -239.706
Total T: 91600 Episode Num: 458 Episode T: 200 Reward: -128.410
Total T: 91800 Episode Num: 459 Episode T: 200 Reward: -119.607
Total T: 92000 Episode Num: 460 Episode T: 200 Reward: -270.188
recent Evaluation: -223.14749231490015
Total T: 92200 Episode Num: 461 Episode T: 200 Reward: -246.392
Total T: 92400 Episode Num: 462 Episode T: 200 Reward: -126.675
Total T: 92600 Episode Num: 463 Episode T: 200 Reward: -126.644
Total T: 92800 Episode Num: 464 Episode T: 200 Reward: -123.109
Total T: 93000 Episode Num: 465 Episode T: 200 Reward: -247.164
recent Evaluation: -126.2401808439915
Total T: 93200 Episode Num: 466 Episode T: 200 Reward: -352.841
Total T: 93400 Episode Num: 467 Episode T: 200 Reward: -7.999
Total T: 93600 Episode Num: 468 Episode T: 200 Reward: -6.456
Total T: 93800 Episode Num: 469 Episode T: 200 Reward: -125.484
Total T: 94000 Episode Num: 470 Episode T: 200 Reward: -353.068
recent Evaluation: -137.29794689270898
Total T: 94200 Episode Num: 471 Episode T: 200 Reward: -8.728
Total T: 94400 Episode Num: 472 Episode T: 200 Reward: -237.947
Total T: 94600 Episode Num: 473 Episode T: 200 Reward: -125.657
Total T: 94800 Episode Num: 474 Episode T: 200 Reward: -129.543
Total T: 95000 Episode Num: 475 Episode T: 200 Reward: -363.594
recent Evaluation: -159.71785095544655
Total T: 95200 Episode Num: 476 Episode T: 200 Reward: -120.463
Total T: 95400 Episode Num: 477 Episode T: 200 Reward: -121.573
Total T: 95600 Episode Num: 478 Episode T: 200 Reward: -5.020
Total T: 95800 Episode Num: 479 Episode T: 200 Reward: -122.777
Total T: 96000 Episode Num: 480 Episode T: 200 Reward: -248.121
recent Evaluation: -168.01315485023764
Total T: 96200 Episode Num: 481 Episode T: 200 Reward: -128.363
Total T: 96400 Episode Num: 482 Episode T: 200 Reward: -241.355
Total T: 96600 Episode Num: 483 Episode T: 200 Reward: -124.086
Total T: 96800 Episode Num: 484 Episode T: 200 Reward: -129.692
Total T: 97000 Episode Num: 485 Episode T: 200 Reward: -235.944
recent Evaluation: -135.39119018657553
Total T: 97200 Episode Num: 486 Episode T: 200 Reward: -378.541
Total T: 97400 Episode Num: 487 Episode T: 200 Reward: -4.610
Total T: 97600 Episode Num: 488 Episode T: 200 Reward: -240.045
Total T: 97800 Episode Num: 489 Episode T: 200 Reward: -126.631
Total T: 98000 Episode Num: 490 Episode T: 200 Reward: -238.922
recent Evaluation: -210.71439164398438
Total T: 98200 Episode Num: 491 Episode T: 200 Reward: -354.087
Total T: 98400 Episode Num: 492 Episode T: 200 Reward: -241.512
Total T: 98600 Episode Num: 493 Episode T: 200 Reward: -305.487
Total T: 98800 Episode Num: 494 Episode T: 200 Reward: -8.638
Total T: 99000 Episode Num: 495 Episode T: 200 Reward: -234.255
recent Evaluation: -150.23264673318585
Total T: 99200 Episode Num: 496 Episode T: 200 Reward: -122.914
Total T: 99400 Episode Num: 497 Episode T: 200 Reward: -230.410

```

## Four-Solution-Maze Environment (optional)

### TODOs for you:

- Q11. (bonus) In this section, another environment named Four-Solution-Maze is provided for you to evaluate your algorithms.

The task is quite simple, yet never easy for even PPO/TD3.

The default size of the maze is 64x64, and in each game (episode), the agent is initialized randomly in the maze. There are 4 positions in the maze that has non-trivial reward of +10, while reaching other region will receive only a tiny punishment of -0.1. An optimal policy should be able to find the shortest path to the most recent reward region (i.e., one of the four high-reward regions.).

The action space is continuous with range [-1,1], larger actions will be clipped.

```

In [2]: import numpy as np
import matplotlib.pyplot as plt
from pylab import *
from numpy import *
import copy

class FourWayGridWorld:
    def __init__(self, N=17, left = 10, right = 10, up=10, down = 10, seed=0):
        self.N = N

        self.left = left
        self.right = right
        self.up = up
        self.down = down
        self.action_space = np.asarray([np.random.rand(1), np.random.rand(1)])
        self.observation_space = np.asarray([np.random.randint(self.N), np.random.randint(self.N)])
        self.map = np.ones((N,N))*(-0.1)
        self.map[int((N-1)/2), 0] = self.left
        self.map[0, int((N-1)/2)] = self.up
        self.map[N-1, int((N-1)/2)] = self.down
        self.map[int((N-1)/2), N-1] = self.right

        self.terminal = [(int((N-1)/2),0),
                        (0,int((N-1)/2)),
                        (N-1,int((N-1)/2)),
                        (int((N-1)/2),N-1)]

        # self.seed = np.random.seed(seed)
        self.loc = np.asarray([np.random.randint(N), np.random.randint(N)])

        self.step_num = 0
        self.done = False

    def step(self, action):
        action = np.clip(action, -1, 1)
        new_loc = np.clip(self.loc + action, 0, self.N-1)
        self.loc = new_loc

        reward = self.map[int(round(self.loc[0])), int(round(self.loc[1]))]
        loc = (int(round(self.loc[0])), int(round(self.loc[1])))
        if loc in self.terminal:
            self.done = True

```

```

        self.step_num+=1
        return self.loc, reward, True if self.done or self.ifdone() else False

    def ifdone(self):
        if self.step_num >= 2*self.N:
            return True
        else:
            return False

    def render(self):
        map_self = copy.deepcopy(self.map)
        map_self[int(self.loc[0]),int(self.loc[1])] = -5
        plt.imshow(map_self)

    def reset(self, seed=0):
        self.done = False

        # self.seed = np.random.seed(seed)

        self.map = np.ones((self.N,self.N))*(-0.1)
        self.map[int((self.N-1)/2),0] = self.left
        self.map[0,int((self.N-1)/2)] = self.up
        self.map[self.N-1,int((self.N-1)/2)] = self.down
        self.map[int((self.N-1)/2),self.N-1] = self.right
        self.loc = np.asarray([np.random.randint(self.N),np.random.randint(self.N)])
        self.step_num = 0
        return self.loc

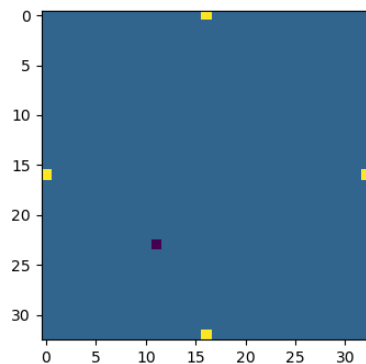
```

In [14...] env = FourWayGridWorld(33)

In [14...] env.reset()

Out[14...] array([23, 11])

In [14...] env.render()



## PPO-FourWayGridWorld

```

In [14...] # You need not to rivese this unless you want to try other hyper-parameter settings
# in which case you may revise the default values of class args()
from IPython import display
import torch
import torch.nn as nn
import torch.optim as opt
from torch import Tensor
from torch.autograd import Variable
from collections import namedtuple
from itertools import count
import torch.nn.functional as F
import matplotlib.pyplot as plt
from os.path import join as joindir
from os import makedirs as mkdir
import pandas as pd
import numpy as np
import argparse
import datetime
import math
import random

ENV_NAME = 'FourWayGridWorld'

Transition = namedtuple('Transition', ('state', 'value', 'action', 'logproba', 'mask', 'next_state', 'reward'))
env = FourWayGridWorld(33)
env.reset()

EPS = 1e-10 # you may need this tiny value somewhere, and think about why?
RESULT_DIR = 'Result_PP0'
mkdir(RESULT_DIR, exist_ok=True)
mkdir(ENV_NAME.split('-')[0]+'CheckPoints', exist_ok=True)
mkdir(ENV_NAME.split('-')[0]+'Rwds', exist_ok=True)
rwds = []
rwds_history = []

class args(object):
    hid_num = 256
    drop_prob = 0.1
    # env_name = ENV_NAME
    seed = 1
    num_episode = 300
    batch_size = 5120
    max_step_per_round = 2000
    gamma = 0.99
    lamda = 0.95
    log_num_episode = 1
    num_epoch = 10
    minibatch_size = 512

```

```

clip = 0.2
loss_coeff_value = 0.5
loss_coeff_entropy = 0.01
lr = 3e-4
num_parallel_run = 1
# tricks
schedule_adam = 'linear'
schedule_clip = 'linear'
layer_norm = True
state_norm = True
advantage_norm = True
lossvalue_norm = True

```

In [15...

# Here, you need to finish the first 5 tasks.

```

class ActorCritic(nn.Module):
    def __init__(self, num_inputs, num_outputs, layer_norm=True):
        super(ActorCritic, self).__init__()

        """
        Q1:
        Initialize your networks
        """

        self.actor_fc1 = nn.Linear(2, args.hid_num)
        self.actor_fc2 = nn.Linear(args.hid_num, args.hid_num)
        self.actor_fc3 = nn.Linear(args.hid_num, 2)
        self.actor_logstd = nn.Parameter(torch.zeros(1, num_outputs))
        #self.actor_logstd = nn.Linear(args.hid_num, 1)

        self.critic_fc1 = nn.Linear(2, args.hid_num)
        self.critic_fc2 = nn.Linear(args.hid_num, args.hid_num)
        self.critic_fc3 = nn.Linear(args.hid_num, 1)

        if layer_norm:
            self.layer_norm(self.actor_fc1, std=1.0)
            self.layer_norm(self.actor_fc2, std=1.0)
            self.layer_norm(self.actor_fc3, std=0.01)

            self.layer_norm(self.critic_fc1, std=1.0)
            self.layer_norm(self.critic_fc2, std=1.0)
            self.layer_norm(self.critic_fc3, std=1.0)

    @staticmethod
    def layer_norm(layer, std=1.0, bias_const=0.0):
        torch.nn.init.orthogonal_(layer.weight, std)
        torch.nn.init.constant_(layer.bias, bias_const)

    def forward(self, states):
        """
        Q2.1:
        run policy network (actor) as well as value network (critic)
        :param states: a tensor represents states
        :return: 3 Tensor2
        your _forward_actor() function should return both the mean value of action and the log-standard deviation of the action
        """

        action_mean, action_logstd = self._forward_actor(states)
        critic_value = self._forward_critic(states)
        return action_mean, action_logstd, critic_value

    def _forward_actor(self, states):
        """
        Q2.2:
        build something like
        x = activation (actor_fc(state))
        the logstd output has already been provided
        """

        x1 = F.relu(self.actor_fc1(states))
        x2 = F.relu(self.actor_fc2(x1))
        action_mean = F.tanh(self.actor_fc3(x2))
        action_logstd = self.actor_logstd.expand_as(action_mean)
        #action_logstd = F.softplus(self.actor_logstd(x2))
        return action_mean, action_logstd

    def _forward_critic(self, states):
        """
        Q2.3:
        build something like
        x = activation (critic_fc(state))'''
        c1 = F.relu(self.critic_fc1(states))
        c2 = F.relu(self.critic_fc2(c1))
        critic_value = self.critic_fc3(c2)
        return critic_value

    def select_action(self, action_mean, action_logstd, return_logproba=True):
        """
        Q3.1:
        given mean and std, sample an action from normal(mean, std)
        also returns probability of the given chosen
        """

        action_std = torch.exp(action_logstd)
        action = torch.normal(action_mean, action_std)
        if return_logproba:
            logproba = self._normal_logproba(action, action_mean, action_logstd, action_std)

        return action, logproba

    @staticmethod
    def _normal_logproba(x, mean, logstd, std=None):
        """
        Q3.2:
        given a mean and logstd of a gaussian,
        calculate the log-probability of a given x'''

        if std is None:
            std = torch.exp(logstd)

        std_sq = std.pow(2)
        logproba = - 0.5 * math.log(2 * math.pi) - logstd - (x - mean).pow(2) / (2 * std_sq)

        return logproba.sum(1)

    def get_logproba(self, states, actions):
        """
        return probability of chosen the given actions under corresponding states of current network
        """

```

```

:param states: Tensor
:param actions: Tensor
"""
    action_mean, action_logstd = self._forward_actor(states)
    action_mean = action_mean.cpu()
    action_logstd = action_logstd.cpu()
    logproba = self._normal_logproba(actions, action_mean, action_logstd)
    return logproba

class Memory(object):
    def __init__(self):
        self.memory = []

    def push(self, *args):
        self.memory.append(Transition(*args))

    def sample(self):
        return Transition(*zip(*self.memory))

    def __len__(self):
        return len(self.memory)

# env = gym.make(ENV_NAME)
num_inputs = env.observation_space.shape[0]
num_actions = env.action_space.shape[0]
network = ActorCritic(num_inputs, num_actions, layer_norm=args.layer_norm)
network.train()
def ppo(args):
    # env = gym.make(args.env_name)
    num_inputs = env.observation_space.shape[0]
    num_actions = env.action_space.shape[0]

    # env.seed(args.seed)
    torch.manual_seed(args.seed)

    #network = ActorCritic(num_inputs, num_actions, layer_norm=args.layer_norm)
    optimizer = opt.Adam(network.parameters(), lr=args.lr)

    running_state = ZFilter((num_inputs,), clip=5.0)

    # record average 1-round cumulative reward in every episode
    reward_record = []
    global_steps = 0

    lr_now = args.lr
    clip_now = args.clip

    for i_episode in range(args.num_episode):
        # step1: perform current policy to collect trajectories
        # this is an on-policy method!
        memory = Memory()
        num_steps = 0
        reward_list = []
        len_list = []
        while num_steps < args.batch_size:
            state = env.reset()
            if args.state_norm:
                state = running_state(state)
            reward_sum = 0
            for t in range(args.max_step_per_round):
                action_mean, action_logstd, value = network(Tensor(state).unsqueeze(0))
                action, logproba = network.select_action(action_mean, action_logstd)
                action = action.cpu().data.numpy()[0]
                logproba = logproba.cpu().data.numpy()[0]
                next_state, reward, done = env.step(action)

                reward_sum += reward
                if args.state_norm:
                    next_state = running_state(next_state)
                mask = 0 if done else 1

                memory.push(state, value, action, logproba, mask, next_state, reward)

            if done:
                break

            state = next_state

            num_steps += (t + 1)
            global_steps += (t + 1)
            reward_list.append(reward_sum)
            len_list.append(t + 1)
        reward_record.append({
            'episode': i_episode,
            'steps': global_steps,
            'meanepreward': np.mean(reward_list),
            'meanepflen': np.mean(len_list)})
        rlds.extend(reward_list)
        batch = memory.sample()
        batch_size = len(memory)

        # step2: extract variables from trajectories
        rewards = Tensor(batch.reward)
        values = Tensor(batch.value)
        masks = Tensor(batch.mask)
        actions = Tensor(batch.action)
        states = Tensor(batch.state)
        oldlogproba = Tensor(batch.logproba)

        returns = Tensor(batch_size)
        deltas = Tensor(batch_size)
        advantages = Tensor(batch_size)

        prev_return = 0
        prev_value = 0
        prev_advantage = 0
        for i in reversed(range(batch_size)):
            returns[i] = rewards[i] + args.gamma * prev_return * masks[i]
            deltas[i] = rewards[i] + args.gamma * prev_value * masks[i] - values[i]
            # ref: https://arxiv.org/pdf/1506.02438.pdf (generalization advantage estimate)
            advantages[i] = deltas[i] + args.gamma * args.lamda * prev_advantage * masks[i]

            prev_return = returns[i]
            prev_value = values[i]

```

```

    prev_advantage = advantages[i]
    if args.advantage_norm:
        advantages = (advantages - advantages.mean()) / (advantages.std() + EPS)

    for i_epoch in range(int(args.num_epoch * batch_size / args.minibatch_size)):
        # sample from current batch
        minibatch_ind = np.random.choice(batch_size, args.minibatch_size, replace=False)
        minibatch_states = states[minibatch_ind]
        minibatch_actions = actions[minibatch_ind]
        minibatch_oldlogproba = oldlogproba[minibatch_ind]
        minibatch_newlogproba = network.get_logproba(minibatch_states, minibatch_actions)
        minibatch_advantages = advantages[minibatch_ind]
        minibatch_returns = returns[minibatch_ind]
        minibatch_newvalues = network._forward_critic(minibatch_states).flatten()

        Q4:

        HERE:
        now you have the advantages, and log-probabilities (both pi_new and pi_old)
        you need to do optimization according to the CLIP loss

        ratio = torch.exp(minibatch_newlogproba - minibatch_oldlogproba)

        surr1 = ratio * minibatch_advantages
        surr2 = torch.clamp(ratio, 1.0 - clip_now, 1.0 + clip_now) * minibatch_advantages
        loss_surr = -torch.min(surr1, surr2).mean()

        if args.lossvalue_norm:
            minibatch_return_6std = 6 * minibatch_returns.std()
            loss_value = torch.mean((minibatch_newvalues - minibatch_returns).pow(2)) / minibatch_return_6std
        else:
            loss_value = torch.mean((minibatch_newvalues - minibatch_returns).pow(2))

        loss_entropy = torch.mean(torch.exp(minibatch_newlogproba) * minibatch_newlogproba)

        total_loss = loss_surr + args.loss_coeff_value * loss_value + args.loss_coeff_entropy * loss_entropy
        optimizer.zero_grad()
        total_loss.backward()
        optimizer.step()

        if args.schedule_clip == 'linear':
            ep_ratio = 1 - (i_episode / args.num_episode)
            clip_now = args.clip * ep_ratio

        if args.schedule_adam == 'linear':
            ep_ratio = 1 - (i_episode / args.num_episode)
            lr_now = args.lr * ep_ratio
            for g in optimizer.param_groups:
                g['lr'] = lr_now

        if i_episode % args.log_num_episode == 0:
            print('Finished episode: {} Reward: {:.4f} total_loss = {:.4f} = {:.4f} + {} * {:.4f} + {} * {:.4f}' \
                  .format(i_episode, reward_record[-1]['meanepreward'], total_loss.data, loss_surr.data, args.loss_coeff_value,
                          loss_value.data, args.loss_coeff_entropy, loss_entropy.data))
            print('-----')

    return reward_record

def test(args):
    record_dfs = []
    for i in range(args.num_parallel_run):
        args.seed += 1
        reward_record = pd.DataFrame(ppo(args))
        reward_record['#parallel_run'] = i
        record_dfs.append(reward_record)
    record_dfs = pd.concat(record_dfs, axis=0)
    record_dfs.to_csv(joinindir(RESULT_DIR, 'ppo-record-{}.csv'.format(args.env_name)))

if __name__ == '__main__':
    for envname in [ENV_NAME]:
        test(args)

torch.save(network.state_dict(), args.env_name.split('-')[0] + '/CheckPoints/checkpoint_Four-Solution-Maze_new_{}hidden'.format(args.hid_num))
np.savetxt(args.env_name.split('-')[0] + '/Rwds/Four-Solution-Maze_rwds_new_{}hidden'.format(args.hid_num), rwsds)
Finished episode: 0 Reward: -5.4171 total_loss = 0.2106 = 0.0189 + 0.5 * 0.3871 + 0.01 * -0.1842
-----
Finished episode: 1 Reward: -5.3284 total_loss = 0.2340 = 0.0266 + 0.5 * 0.4188 + 0.01 * -0.1908
-----
Finished episode: 2 Reward: -4.0729 total_loss = 0.2284 = -0.0338 + 0.5 * 0.5281 + 0.01 * -0.1898
-----
Finished episode: 3 Reward: -4.8915 total_loss = 0.2544 = 0.0158 + 0.5 * 0.4812 + 0.01 * -0.1983
-----
Finished episode: 4 Reward: -3.3333 total_loss = 0.2408 = -0.0353 + 0.5 * 0.5561 + 0.01 * -0.1940
-----
Finished episode: 5 Reward: -2.4615 total_loss = 0.1504 = -0.0539 + 0.5 * 0.4125 + 0.01 * -0.1961
-----
Finished episode: 6 Reward: -0.7820 total_loss = 0.3061 = 0.0285 + 0.5 * 0.5592 + 0.01 * -0.1959
-----
Finished episode: 7 Reward: 0.8848 total_loss = 0.2474 = -0.0083 + 0.5 * 0.5154 + 0.01 * -0.2038
-----
Finished episode: 8 Reward: 2.1637 total_loss = 0.2840 = -0.0126 + 0.5 * 0.5972 + 0.01 * -0.1972
-----
Finished episode: 9 Reward: 4.3768 total_loss = 0.2805 = 0.0189 + 0.5 * 0.5274 + 0.01 * -0.2053
-----
Finished episode: 10 Reward: 6.4622 total_loss = 0.0938 = -0.0509 + 0.5 * 0.2939 + 0.01 * -0.2194
-----
Finished episode: 11 Reward: 6.6066 total_loss = 0.1098 = -0.0691 + 0.5 * 0.3622 + 0.01 * -0.2184
-----
Finished episode: 12 Reward: 7.7974 total_loss = 0.0695 = -0.0158 + 0.5 * 0.1750 + 0.01 * -0.2195
-----
Finished episode: 13 Reward: 7.8054 total_loss = 0.0457 = -0.0882 + 0.5 * 0.2723 + 0.01 * -0.2323
-----
Finished episode: 14 Reward: 8.1375 total_loss = -0.0609 = -0.1240 + 0.5 * 0.1309 + 0.01 * -0.2316
-----
Finished episode: 15 Reward: 8.3328 total_loss = -0.0167 = -0.0562 + 0.5 * 0.0835 + 0.01 * -0.2307
-----
Finished episode: 16 Reward: 8.4003 total_loss = 0.1168 = 0.0430 + 0.5 * 0.1522 + 0.01 * -0.2313
-----
Finished episode: 17 Reward: 8.5009 total_loss = 0.0317 = 0.0027 + 0.5 * 0.0628 + 0.01 * -0.2407
-----
Finished episode: 18 Reward: 8.5065 total_loss = 0.0989 = 0.0721 + 0.5 * 0.0585 + 0.01 * -0.2462
-----
Finished episode: 19 Reward: 8.5668 total_loss = -0.0199 = -0.0388 + 0.5 * 0.0432 + 0.01 * -0.2654
-----

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Finished episode: 20 Reward: 8.4975 total_loss = 0.0670 = 0.0434 + 0.5 * 0.0522 + 0.01 * -0.2565
-----
Finished episode: 21 Reward: 8.5825 total_loss = -0.0035 = -0.0194 + 0.5 * 0.0369 + 0.01 * -0.2589
-----
Finished episode: 22 Reward: 8.6893 total_loss = 0.0509 = 0.0313 + 0.5 * 0.0447 + 0.01 * -0.2651
-----
Finished episode: 23 Reward: 8.6823 total_loss = -0.0001 = -0.0128 + 0.5 * 0.0308 + 0.01 * -0.2721
-----
Finished episode: 24 Reward: 8.6282 total_loss = -0.0104 = -0.0261 + 0.5 * 0.0369 + 0.01 * -0.2733
-----
Finished episode: 25 Reward: 8.7057 total_loss = 0.0193 = 0.0064 + 0.5 * 0.0314 + 0.01 * -0.2827
-----
Finished episode: 26 Reward: 8.8227 total_loss = -0.0181 = -0.0269 + 0.5 * 0.0234 + 0.01 * -0.2897
-----
Finished episode: 27 Reward: 8.7739 total_loss = -0.0440 = -0.0540 + 0.5 * 0.0258 + 0.01 * -0.2945
-----
Finished episode: 28 Reward: 8.7939 total_loss = -0.0970 = -0.1036 + 0.5 * 0.0189 + 0.01 * -0.2878
-----
Finished episode: 29 Reward: 8.8410 total_loss = 0.0104 = 0.0015 + 0.5 * 0.0238 + 0.01 * -0.3033
-----
Finished episode: 30 Reward: 8.8219 total_loss = -0.0119 = -0.0211 + 0.5 * 0.0243 + 0.01 * -0.2921
-----
Finished episode: 31 Reward: 8.8163 total_loss = 0.0346 = 0.0257 + 0.5 * 0.0237 + 0.01 * -0.3032
-----
Finished episode: 32 Reward: 8.8654 total_loss = 0.0062 = 0.0018 + 0.5 * 0.0148 + 0.01 * -0.3011
-----
Finished episode: 33 Reward: 8.9111 total_loss = 0.0115 = 0.0050 + 0.5 * 0.0189 + 0.01 * -0.2978
-----
Finished episode: 34 Reward: 8.8609 total_loss = -0.0030 = -0.0062 + 0.5 * 0.0123 + 0.01 * -0.2968
-----
Finished episode: 35 Reward: 8.8338 total_loss = -0.0186 = -0.0238 + 0.5 * 0.0164 + 0.01 * -0.2965
-----
Finished episode: 36 Reward: 8.9175 total_loss = 0.0190 = 0.0169 + 0.5 * 0.0101 + 0.01 * -0.2993
-----
Finished episode: 37 Reward: 8.8827 total_loss = 0.0396 = 0.0287 + 0.5 * 0.0276 + 0.01 * -0.2956
-----
Finished episode: 38 Reward: 8.8922 total_loss = 0.0223 = 0.0178 + 0.5 * 0.0148 + 0.01 * -0.2906
-----
Finished episode: 39 Reward: 8.9433 total_loss = 0.0125 = 0.0076 + 0.5 * 0.0155 + 0.01 * -0.2888
-----
Finished episode: 40 Reward: 8.9372 total_loss = 0.0122 = 0.0095 + 0.5 * 0.0112 + 0.01 * -0.2898
-----
Finished episode: 41 Reward: 8.9498 total_loss = 0.0045 = 0.0024 + 0.5 * 0.0098 + 0.01 * -0.2829
-----
Finished episode: 42 Reward: 8.9065 total_loss = -0.0059 = -0.0085 + 0.5 * 0.0107 + 0.01 * -0.2774
-----
Finished episode: 43 Reward: 8.9770 total_loss = -0.0261 = -0.0299 + 0.5 * 0.0130 + 0.01 * -0.2678
-----
Finished episode: 44 Reward: 8.8974 total_loss = 0.0308 = 0.0263 + 0.5 * 0.0142 + 0.01 * -0.2537
-----
Finished episode: 45 Reward: 8.9725 total_loss = 0.0253 = 0.0240 + 0.5 * 0.0077 + 0.01 * -0.2542
-----
Finished episode: 46 Reward: 8.9539 total_loss = -0.0615 = -0.0629 + 0.5 * 0.0076 + 0.01 * -0.2361
-----
Finished episode: 47 Reward: 8.9998 total_loss = 0.0489 = 0.0449 + 0.5 * 0.0126 + 0.01 * -0.2258
-----
Finished episode: 48 Reward: 8.9736 total_loss = 0.0015 = -0.0034 + 0.5 * 0.0142 + 0.01 * -0.2173
-----
Finished episode: 49 Reward: 8.9539 total_loss = 0.0218 = 0.0200 + 0.5 * 0.0079 + 0.01 * -0.2133
-----
Finished episode: 50 Reward: 9.0041 total_loss = 0.0424 = 0.0416 + 0.5 * 0.0056 + 0.01 * -0.1948
-----
Finished episode: 51 Reward: 9.0140 total_loss = -0.0156 = -0.0175 + 0.5 * 0.0071 + 0.01 * -0.1700
-----
Finished episode: 52 Reward: 8.9570 total_loss = 0.0931 = 0.0901 + 0.5 * 0.0090 + 0.01 * -0.1506
-----
Finished episode: 53 Reward: 8.9698 total_loss = 0.0334 = 0.0319 + 0.5 * 0.0056 + 0.01 * -0.1260
-----
Finished episode: 54 Reward: 9.0204 total_loss = -0.0237 = -0.0256 + 0.5 * 0.0059 + 0.01 * -0.1082
-----
Finished episode: 55 Reward: 9.0514 total_loss = 0.0198 = 0.0173 + 0.5 * 0.0067 + 0.01 * -0.0919
-----
Finished episode: 56 Reward: 9.0301 total_loss = 0.0314 = 0.0285 + 0.5 * 0.0076 + 0.01 * -0.0859
-----
Finished episode: 57 Reward: 8.9799 total_loss = -0.0274 = -0.0294 + 0.5 * 0.0047 + 0.01 * -0.0314
-----
Finished episode: 58 Reward: 9.0298 total_loss = -0.0767 = -0.0791 + 0.5 * 0.0044 + 0.01 * 0.0185
-----
Finished episode: 59 Reward: 9.0274 total_loss = 0.0760 = 0.0683 + 0.5 * 0.0154 + 0.01 * -0.0002
-----
Finished episode: 60 Reward: 9.0498 total_loss = -0.0811 = -0.0833 + 0.5 * 0.0035 + 0.01 * 0.0488
-----
Finished episode: 61 Reward: 9.0417 total_loss = -0.0126 = -0.0202 + 0.5 * 0.0137 + 0.01 * 0.0745
-----
Finished episode: 62 Reward: 9.0356 total_loss = 0.0122 = 0.0084 + 0.5 * 0.0059 + 0.01 * 0.0828
-----
Finished episode: 63 Reward: 9.0496 total_loss = -0.0219 = -0.0266 + 0.5 * 0.0068 + 0.01 * 0.1313
-----
Finished episode: 64 Reward: 9.0740 total_loss = 0.0034 = 0.0001 + 0.5 * 0.0035 + 0.01 * 0.1605
-----
Finished episode: 65 Reward: 9.0353 total_loss = 0.0245 = 0.0191 + 0.5 * 0.0064 + 0.01 * 0.2242
-----
Finished episode: 66 Reward: 9.0455 total_loss = -0.0146 = -0.0210 + 0.5 * 0.0078 + 0.01 * 0.2476
-----
Finished episode: 67 Reward: 9.0719 total_loss = 0.0548 = 0.0495 + 0.5 * 0.0048 + 0.01 * 0.2861
-----
Finished episode: 68 Reward: 9.0106 total_loss = 0.0062 = -0.0009 + 0.5 * 0.0073 + 0.01 * 0.3451
-----
Finished episode: 69 Reward: 9.0239 total_loss = 0.0576 = 0.0505 + 0.5 * 0.0055 + 0.01 * 0.4343
-----
Finished episode: 70 Reward: 9.0549 total_loss = 0.0704 = 0.0612 + 0.5 * 0.0089 + 0.01 * 0.4709
-----
Finished episode: 71 Reward: 9.0634 total_loss = 0.0448 = 0.0378 + 0.5 * 0.0045 + 0.01 * 0.4819
-----
Finished episode: 72 Reward: 9.0528 total_loss = 0.0384 = 0.0300 + 0.5 * 0.0056 + 0.01 * 0.5556
-----
Finished episode: 73 Reward: 9.0768 total_loss = 0.0175 = 0.0075 + 0.5 * 0.0080 + 0.01 * 0.6050
-----
Finished episode: 74 Reward: 9.0888 total_loss = -0.0434 = -0.0519 + 0.5 * 0.0042 + 0.01 * 0.6360
-----
Finished episode: 75 Reward: 9.0106 total_loss = 0.0976 = 0.0886 + 0.5 * 0.0046 + 0.01 * 0.6659
-----
Finished episode: 76 Reward: 9.0638 total_loss = 0.0251 = 0.0153 + 0.5 * 0.0051 + 0.01 * 0.7203
-----
Finished episode: 77 Reward: 9.0365 total_loss = -0.0371 = -0.0470 + 0.5 * 0.0043 + 0.01 * 0.7767
-----
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Finished episode: 78 Reward: 9.0848 total_loss = 0.0221 = 0.0120 + 0.5 * 0.0039 + 0.01 * 0.8227
Finished episode: 79 Reward: 9.0756 total_loss = -0.0181 = -0.0276 + 0.5 * 0.0025 + 0.01 * 0.8305
Finished episode: 80 Reward: 9.0760 total_loss = 0.0067 = -0.0053 + 0.5 * 0.0034 + 0.01 * 1.0263
Finished episode: 81 Reward: 9.0725 total_loss = -0.0247 = -0.0367 + 0.5 * 0.0037 + 0.01 * 1.0109
Finished episode: 82 Reward: 9.0331 total_loss = 0.0238 = 0.0109 + 0.5 * 0.0053 + 0.01 * 1.0281
Finished episode: 83 Reward: 9.0730 total_loss = 0.0856 = 0.0726 + 0.5 * 0.0028 + 0.01 * 1.1589
Finished episode: 84 Reward: 9.0435 total_loss = 0.0201 = 0.0056 + 0.5 * 0.0037 + 0.01 * 1.2657
Finished episode: 85 Reward: 9.0703 total_loss = 0.0350 = 0.0225 + 0.5 * 0.0024 + 0.01 * 1.1275
Finished episode: 86 Reward: 9.0853 total_loss = 0.0233 = 0.0063 + 0.5 * 0.0061 + 0.01 * 1.4009
Finished episode: 87 Reward: 9.0750 total_loss = 0.0391 = 0.0250 + 0.5 * 0.0031 + 0.01 * 1.2535
Finished episode: 88 Reward: 9.0466 total_loss = -0.0246 = -0.0403 + 0.5 * 0.0035 + 0.01 * 1.3935
Finished episode: 89 Reward: 9.0823 total_loss = -0.0070 = -0.0228 + 0.5 * 0.0024 + 0.01 * 1.4605
Finished episode: 90 Reward: 9.0850 total_loss = -0.0458 = -0.0652 + 0.5 * 0.0062 + 0.01 * 1.6279
Finished episode: 91 Reward: 9.0598 total_loss = 0.0622 = 0.0427 + 0.5 * 0.0028 + 0.01 * 1.8049
Finished episode: 92 Reward: 9.0912 total_loss = 0.0757 = 0.0566 + 0.5 * 0.0019 + 0.01 * 1.8149
Finished episode: 93 Reward: 9.0821 total_loss = -0.0342 = -0.0552 + 0.5 * 0.0051 + 0.01 * 1.8378
Finished episode: 94 Reward: 9.0780 total_loss = 0.0033 = -0.0174 + 0.5 * 0.0061 + 0.01 * 1.7629
Finished episode: 95 Reward: 9.0829 total_loss = 0.0080 = -0.0104 + 0.5 * 0.0028 + 0.01 * 1.6960
Finished episode: 96 Reward: 9.0881 total_loss = -0.0365 = -0.0596 + 0.5 * 0.0023 + 0.01 * 2.1962
Finished episode: 97 Reward: 9.0774 total_loss = 0.0850 = 0.0612 + 0.5 * 0.0029 + 0.01 * 2.2260
Finished episode: 98 Reward: 9.1125 total_loss = 0.0402 = 0.0131 + 0.5 * 0.0045 + 0.01 * 2.4917
Finished episode: 99 Reward: 9.0957 total_loss = -0.0077 = -0.0330 + 0.5 * 0.0020 + 0.01 * 2.4332
Finished episode: 100 Reward: 9.1167 total_loss = 0.0266 = 0.0003 + 0.5 * 0.0029 + 0.01 * 2.4866
Finished episode: 101 Reward: 9.0961 total_loss = -0.0431 = -0.0701 + 0.5 * 0.0035 + 0.01 * 2.5269
Finished episode: 102 Reward: 9.1016 total_loss = 0.0134 = -0.0130 + 0.5 * 0.0043 + 0.01 * 2.4310
Finished episode: 103 Reward: 9.0935 total_loss = 0.0090 = -0.0192 + 0.5 * 0.0021 + 0.01 * 2.7141
Finished episode: 104 Reward: 9.0862 total_loss = 0.0157 = -0.0165 + 0.5 * 0.0042 + 0.01 * 3.0044
Finished episode: 105 Reward: 9.1284 total_loss = 0.0317 = 0.0002 + 0.5 * 0.0018 + 0.01 * 3.0569
Finished episode: 106 Reward: 9.1437 total_loss = 0.1033 = 0.0693 + 0.5 * 0.0047 + 0.01 * 3.1603
Finished episode: 107 Reward: 9.1234 total_loss = -0.0643 = -0.1002 + 0.5 * 0.0044 + 0.01 * 3.3783
Finished episode: 108 Reward: 9.1054 total_loss = 0.0868 = 0.0532 + 0.5 * 0.0054 + 0.01 * 3.0877
Finished episode: 109 Reward: 9.0916 total_loss = -0.0717 = -0.1093 + 0.5 * 0.0070 + 0.01 * 3.4062
Finished episode: 110 Reward: 9.1180 total_loss = 0.0811 = 0.0461 + 0.5 * 0.0044 + 0.01 * 3.2785
Finished episode: 111 Reward: 9.0709 total_loss = 0.0676 = 0.0330 + 0.5 * 0.0044 + 0.01 * 3.2359
Finished episode: 112 Reward: 9.1152 total_loss = 0.0410 = 0.0068 + 0.5 * 0.0024 + 0.01 * 3.3025
Finished episode: 113 Reward: 9.1225 total_loss = 0.0584 = 0.0222 + 0.5 * 0.0021 + 0.01 * 3.5129
Finished episode: 114 Reward: 9.1297 total_loss = 0.0817 = 0.0461 + 0.5 * 0.0019 + 0.01 * 3.4685
Finished episode: 115 Reward: 9.1097 total_loss = 0.0067 = -0.0340 + 0.5 * 0.0019 + 0.01 * 3.9741
Finished episode: 116 Reward: 9.0805 total_loss = 0.0535 = 0.0138 + 0.5 * 0.0019 + 0.01 * 3.8797
Finished episode: 117 Reward: 9.1148 total_loss = 0.0398 = -0.0033 + 0.5 * 0.0055 + 0.01 * 4.0363
Finished episode: 118 Reward: 9.1095 total_loss = 0.0241 = -0.0164 + 0.5 * 0.0019 + 0.01 * 3.9539
Finished episode: 119 Reward: 9.0844 total_loss = 0.0644 = 0.0213 + 0.5 * 0.0049 + 0.01 * 4.0646
Finished episode: 120 Reward: 9.0688 total_loss = 0.0179 = -0.0273 + 0.5 * 0.0074 + 0.01 * 4.1449
Finished episode: 121 Reward: 9.1363 total_loss = 0.0285 = -0.0100 + 0.5 * 0.0016 + 0.01 * 3.7668
Finished episode: 122 Reward: 9.1184 total_loss = -0.0093 = -0.0521 + 0.5 * 0.0043 + 0.01 * 4.0663
Finished episode: 123 Reward: 9.0829 total_loss = 0.0663 = 0.0222 + 0.5 * 0.0022 + 0.01 * 4.3080
Finished episode: 124 Reward: 9.1159 total_loss = 0.0103 = -0.0329 + 0.5 * 0.0060 + 0.01 * 4.0202
Finished episode: 125 Reward: 9.1187 total_loss = 0.0262 = -0.0160 + 0.5 * 0.0016 + 0.01 * 4.1334
Finished episode: 126 Reward: 9.1205 total_loss = 0.0639 = 0.0223 + 0.5 * 0.0020 + 0.01 * 4.0682
Finished episode: 127 Reward: 9.1229 total_loss = -0.0482 = -0.0931 + 0.5 * 0.0026 + 0.01 * 4.3632
Finished episode: 128 Reward: 9.1155 total_loss = 0.0897 = 0.0435 + 0.5 * 0.0020 + 0.01 * 4.5210
Finished episode: 129 Reward: 9.1215 total_loss = 0.0021 = -0.0463 + 0.5 * 0.0019 + 0.01 * 4.7530
Finished episode: 130 Reward: 9.0789 total_loss = 0.0649 = 0.0175 + 0.5 * 0.0031 + 0.01 * 4.5826
Finished episode: 131 Reward: 9.0973 total_loss = 0.0713 = 0.0249 + 0.5 * 0.0015 + 0.01 * 4.5720
Finished episode: 132 Reward: 9.1180 total_loss = 0.1159 = 0.0650 + 0.5 * 0.0028 + 0.01 * 4.9411
Finished episode: 133 Reward: 9.0766 total_loss = 0.0123 = -0.0355 + 0.5 * 0.0045 + 0.01 * 4.5479
Finished episode: 134 Reward: 9.1163 total_loss = 0.0122 = -0.0385 + 0.5 * 0.0068 + 0.01 * 4.7223
Finished episode: 135 Reward: 9.1052 total_loss = 0.0571 = 0.0105 + 0.5 * 0.0013 + 0.01 * 4.5917
```

```
Finished episode: 136 Reward: 9.1638 total_loss = 0.1068 = 0.0567 + 0.5 * 0.0012 + 0.01 * 4.9455
-----
Finished episode: 137 Reward: 9.0667 total_loss = 0.0561 = 0.0008 + 0.5 * 0.0017 + 0.01 * 5.4402
-----
Finished episode: 138 Reward: 9.1266 total_loss = 0.0646 = 0.0120 + 0.5 * 0.0012 + 0.01 * 5.1948
-----
Finished episode: 139 Reward: 9.1312 total_loss = 0.0724 = 0.0218 + 0.5 * 0.0014 + 0.01 * 4.9919
-----
Finished episode: 140 Reward: 9.0973 total_loss = 0.0079 = -0.0465 + 0.5 * 0.0021 + 0.01 * 5.3349
-----
Finished episode: 141 Reward: 9.0837 total_loss = -0.0292 = -0.0853 + 0.5 * 0.0015 + 0.01 * 5.5375
-----
Finished episode: 142 Reward: 9.1150 total_loss = 0.0448 = -0.0107 + 0.5 * 0.0023 + 0.01 * 5.4321
-----
Finished episode: 143 Reward: 9.1192 total_loss = 0.0459 = -0.0103 + 0.5 * 0.0012 + 0.01 * 5.5626
-----
Finished episode: 144 Reward: 9.1133 total_loss = 0.0484 = -0.0059 + 0.5 * 0.0035 + 0.01 * 5.2657
-----
Finished episode: 145 Reward: 9.1116 total_loss = 0.0649 = 0.0106 + 0.5 * 0.0015 + 0.01 * 5.3579
-----
Finished episode: 146 Reward: 9.1356 total_loss = 0.0728 = 0.0131 + 0.5 * 0.0022 + 0.01 * 5.8575
-----
Finished episode: 147 Reward: 9.1514 total_loss = 0.0806 = 0.0236 + 0.5 * 0.0012 + 0.01 * 5.6384
-----
Finished episode: 148 Reward: 9.1056 total_loss = -0.0143 = -0.0677 + 0.5 * 0.0013 + 0.01 * 5.2822
-----
Finished episode: 149 Reward: 9.1408 total_loss = 0.0165 = -0.0397 + 0.5 * 0.0028 + 0.01 * 5.4813
-----
Finished episode: 150 Reward: 9.1383 total_loss = 0.0811 = 0.0268 + 0.5 * 0.0016 + 0.01 * 5.3578
-----
Finished episode: 151 Reward: 9.1550 total_loss = 0.0588 = -0.0002 + 0.5 * 0.0020 + 0.01 * 5.7999
-----
Finished episode: 152 Reward: 9.1216 total_loss = 0.0647 = 0.0067 + 0.5 * 0.0014 + 0.01 * 5.7271
-----
Finished episode: 153 Reward: 9.1279 total_loss = 0.0998 = 0.0450 + 0.5 * 0.0045 + 0.01 * 5.2539
-----
Finished episode: 154 Reward: 9.0893 total_loss = -0.0100 = -0.0660 + 0.5 * 0.0054 + 0.01 * 5.3222
-----
Finished episode: 155 Reward: 9.1244 total_loss = 0.0604 = 0.0053 + 0.5 * 0.0030 + 0.01 * 5.3545
-----
Finished episode: 156 Reward: 9.1412 total_loss = 0.0571 = -0.0034 + 0.5 * 0.0012 + 0.01 * 5.9861
-----
Finished episode: 157 Reward: 9.1260 total_loss = 0.0916 = 0.0348 + 0.5 * 0.0021 + 0.01 * 5.5746
-----
Finished episode: 158 Reward: 9.1129 total_loss = 0.0812 = 0.0246 + 0.5 * 0.0060 + 0.01 * 5.3593
-----
Finished episode: 159 Reward: 9.1328 total_loss = 0.0886 = 0.0285 + 0.5 * 0.0016 + 0.01 * 5.9284
-----
Finished episode: 160 Reward: 9.0986 total_loss = 0.1019 = 0.0446 + 0.5 * 0.0012 + 0.01 * 5.6745
-----
Finished episode: 161 Reward: 9.1449 total_loss = 0.1302 = 0.0758 + 0.5 * 0.0015 + 0.01 * 5.3638
-----
Finished episode: 162 Reward: 9.0819 total_loss = 0.0467 = -0.0144 + 0.5 * 0.0015 + 0.01 * 6.0234
-----
Finished episode: 163 Reward: 9.1095 total_loss = 0.0306 = -0.0313 + 0.5 * 0.0016 + 0.01 * 6.1093
-----
Finished episode: 164 Reward: 9.1064 total_loss = 0.0825 = 0.0261 + 0.5 * 0.0013 + 0.01 * 5.5792
-----
Finished episode: 165 Reward: 9.1138 total_loss = 0.0762 = 0.0198 + 0.5 * 0.0020 + 0.01 * 5.5399
-----
Finished episode: 166 Reward: 9.1165 total_loss = 0.1207 = 0.0623 + 0.5 * 0.0016 + 0.01 * 5.7560
-----
Finished episode: 167 Reward: 9.1482 total_loss = 0.0516 = -0.0102 + 0.5 * 0.0012 + 0.01 * 6.1227
-----
Finished episode: 168 Reward: 9.1370 total_loss = 0.0793 = 0.0229 + 0.5 * 0.0012 + 0.01 * 5.5824
-----
Finished episode: 169 Reward: 9.1339 total_loss = 0.0268 = -0.0338 + 0.5 * 0.0014 + 0.01 * 5.9923
-----
Finished episode: 170 Reward: 9.1253 total_loss = 0.0715 = 0.0086 + 0.5 * 0.0021 + 0.01 * 6.1815
-----
Finished episode: 171 Reward: 9.1494 total_loss = 0.1149 = 0.0529 + 0.5 * 0.0018 + 0.01 * 6.1006
-----
Finished episode: 172 Reward: 9.1368 total_loss = 0.0821 = 0.0268 + 0.5 * 0.0020 + 0.01 * 5.4290
-----
Finished episode: 173 Reward: 9.1260 total_loss = 0.0414 = -0.0199 + 0.5 * 0.0030 + 0.01 * 5.9811
-----
Finished episode: 174 Reward: 9.1326 total_loss = 0.0939 = 0.0335 + 0.5 * 0.0015 + 0.01 * 5.9725
-----
Finished episode: 175 Reward: 9.1426 total_loss = 0.0599 = -0.0001 + 0.5 * 0.0036 + 0.01 * 5.8216
-----
Finished episode: 176 Reward: 9.1184 total_loss = 0.1016 = 0.0406 + 0.5 * 0.0014 + 0.01 * 6.0358
-----
Finished episode: 177 Reward: 9.1000 total_loss = -0.0093 = -0.0697 + 0.5 * 0.0030 + 0.01 * 5.8888
-----
Finished episode: 178 Reward: 9.1014 total_loss = 0.1071 = 0.0458 + 0.5 * 0.0020 + 0.01 * 6.0343
-----
Finished episode: 179 Reward: 9.1131 total_loss = 0.0107 = -0.0483 + 0.5 * 0.0016 + 0.01 * 5.8154
-----
Finished episode: 180 Reward: 9.1047 total_loss = 0.0650 = 0.0025 + 0.5 * 0.0020 + 0.01 * 6.1488
-----
Finished episode: 181 Reward: 9.1192 total_loss = 0.0508 = -0.0103 + 0.5 * 0.0015 + 0.01 * 6.0351
-----
Finished episode: 182 Reward: 9.1068 total_loss = 0.0762 = 0.0164 + 0.5 * 0.0017 + 0.01 * 5.8953
-----
Finished episode: 183 Reward: 9.1249 total_loss = 0.1195 = 0.0598 + 0.5 * 0.0030 + 0.01 * 5.8288
-----
Finished episode: 184 Reward: 9.1068 total_loss = 0.0408 = -0.0172 + 0.5 * 0.0016 + 0.01 * 5.7174
-----
Finished episode: 185 Reward: 9.1254 total_loss = 0.1256 = 0.0675 + 0.5 * 0.0013 + 0.01 * 5.7472
-----
Finished episode: 186 Reward: 9.1286 total_loss = 0.0515 = -0.0087 + 0.5 * 0.0024 + 0.01 * 5.9007
-----
Finished episode: 187 Reward: 9.0760 total_loss = 0.0426 = -0.0158 + 0.5 * 0.0049 + 0.01 * 5.5893
-----
Finished episode: 188 Reward: 9.1657 total_loss = 0.0335 = -0.0225 + 0.5 * 0.0015 + 0.01 * 5.5266
-----
Finished episode: 189 Reward: 9.0998 total_loss = 0.1204 = 0.0586 + 0.5 * 0.0020 + 0.01 * 6.0847
-----
Finished episode: 190 Reward: 9.1056 total_loss = 0.1119 = 0.0509 + 0.5 * 0.0013 + 0.01 * 6.0261
-----
Finished episode: 191 Reward: 9.1530 total_loss = 0.0350 = -0.0227 + 0.5 * 0.0031 + 0.01 * 5.6199
-----
Finished episode: 192 Reward: 9.1219 total_loss = 0.1119 = 0.0513 + 0.5 * 0.0012 + 0.01 * 5.9998
-----
Finished episode: 193 Reward: 9.1394 total_loss = 0.0150 = -0.0435 + 0.5 * 0.0016 + 0.01 * 5.7694
-----
```



```
Finished episode: 194 Reward: 9.1266 total_loss = 0.0615 = 0.0017 + 0.5 * 0.0071 + 0.01 * 5.6231
-----
Finished episode: 195 Reward: 9.1190 total_loss = 0.0745 = 0.0164 + 0.5 * 0.0015 + 0.01 * 5.7338
-----
Finished episode: 196 Reward: 9.1052 total_loss = 0.0130 = -0.0484 + 0.5 * 0.0026 + 0.01 * 6.0101
-----
Finished episode: 197 Reward: 9.0787 total_loss = 0.0761 = 0.0201 + 0.5 * 0.0030 + 0.01 * 5.4460
-----
Finished episode: 198 Reward: 9.1385 total_loss = 0.0256 = -0.0353 + 0.5 * 0.0051 + 0.01 * 5.8347
-----
Finished episode: 199 Reward: 9.1208 total_loss = 0.0286 = -0.0332 + 0.5 * 0.0063 + 0.01 * 5.8609
-----
Finished episode: 200 Reward: 9.0941 total_loss = 0.0714 = 0.0092 + 0.5 * 0.0019 + 0.01 * 6.1301
-----
Finished episode: 201 Reward: 9.1218 total_loss = 0.0663 = 0.0039 + 0.5 * 0.0017 + 0.01 * 6.1551
-----
Finished episode: 202 Reward: 9.1056 total_loss = 0.0005 = -0.0558 + 0.5 * 0.0016 + 0.01 * 5.5510
-----
Finished episode: 203 Reward: 9.1541 total_loss = 0.0253 = -0.0310 + 0.5 * 0.0025 + 0.01 * 5.5079
-----
Finished episode: 204 Reward: 9.1388 total_loss = 0.0435 = -0.0199 + 0.5 * 0.0025 + 0.01 * 6.2136
-----
Finished episode: 205 Reward: 9.1515 total_loss = 0.1271 = 0.0634 + 0.5 * 0.0012 + 0.01 * 6.3062
-----
Finished episode: 206 Reward: 9.1288 total_loss = 0.0846 = 0.0229 + 0.5 * 0.0016 + 0.01 * 6.0876
-----
Finished episode: 207 Reward: 9.0927 total_loss = 0.0540 = -0.0109 + 0.5 * 0.0073 + 0.01 * 6.1288
-----
Finished episode: 208 Reward: 9.0921 total_loss = 0.1640 = 0.1070 + 0.5 * 0.0014 + 0.01 * 5.6246
-----
Finished episode: 209 Reward: 9.1119 total_loss = 0.1288 = 0.0679 + 0.5 * 0.0037 + 0.01 * 5.9090
-----
Finished episode: 210 Reward: 9.1334 total_loss = 0.0125 = -0.0494 + 0.5 * 0.0015 + 0.01 * 6.1195
-----
Finished episode: 211 Reward: 9.1097 total_loss = 0.0630 = -0.0011 + 0.5 * 0.0029 + 0.01 * 6.2560
-----
Finished episode: 212 Reward: 9.1056 total_loss = 0.0549 = -0.0010 + 0.5 * 0.0016 + 0.01 * 5.5155
-----
Finished episode: 213 Reward: 9.0890 total_loss = 0.0235 = -0.0404 + 0.5 * 0.0021 + 0.01 * 6.2846
-----
Finished episode: 214 Reward: 9.0795 total_loss = 0.0199 = -0.0438 + 0.5 * 0.0017 + 0.01 * 6.2821
-----
Finished episode: 215 Reward: 9.1079 total_loss = 0.0544 = -0.0061 + 0.5 * 0.0031 + 0.01 * 5.8932
-----
Finished episode: 216 Reward: 9.1591 total_loss = -0.0409 = -0.1061 + 0.5 * 0.0076 + 0.01 * 6.1436
-----
Finished episode: 217 Reward: 9.0951 total_loss = 0.0335 = -0.0298 + 0.5 * 0.0014 + 0.01 * 6.2540
-----
Finished episode: 218 Reward: 9.1203 total_loss = 0.0458 = -0.0142 + 0.5 * 0.0016 + 0.01 * 5.9262
-----
Finished episode: 219 Reward: 9.1586 total_loss = 0.0774 = 0.0188 + 0.5 * 0.0039 + 0.01 * 5.6619
-----
Finished episode: 220 Reward: 9.0884 total_loss = 0.0000 = -0.0573 + 0.5 * 0.0013 + 0.01 * 5.6638
-----
Finished episode: 221 Reward: 9.1129 total_loss = 0.0635 = 0.0037 + 0.5 * 0.0012 + 0.01 * 5.9248
-----
Finished episode: 222 Reward: 9.1445 total_loss = 0.0468 = -0.0140 + 0.5 * 0.0011 + 0.01 * 6.0281
-----
Finished episode: 223 Reward: 9.1043 total_loss = 0.0531 = -0.0061 + 0.5 * 0.0039 + 0.01 * 5.7244
-----
Finished episode: 224 Reward: 9.0459 total_loss = 0.0938 = 0.0321 + 0.5 * 0.0016 + 0.01 * 6.0882
-----
Finished episode: 225 Reward: 9.1301 total_loss = 0.0403 = -0.0199 + 0.5 * 0.0011 + 0.01 * 5.9700
-----
Finished episode: 226 Reward: 9.1102 total_loss = -0.0049 = -0.0673 + 0.5 * 0.0016 + 0.01 * 6.1635
-----
Finished episode: 227 Reward: 9.1390 total_loss = 0.1003 = 0.0419 + 0.5 * 0.0015 + 0.01 * 5.7548
-----
Finished episode: 228 Reward: 9.1480 total_loss = 0.0524 = -0.0091 + 0.5 * 0.0013 + 0.01 * 6.0826
-----
Finished episode: 229 Reward: 9.1292 total_loss = 0.0112 = -0.0488 + 0.5 * 0.0020 + 0.01 * 5.9076
-----
Finished episode: 230 Reward: 9.1462 total_loss = -0.0446 = -0.1068 + 0.5 * 0.0015 + 0.01 * 6.1484
-----
Finished episode: 231 Reward: 9.1004 total_loss = 0.1123 = 0.0527 + 0.5 * 0.0012 + 0.01 * 5.9061
-----
Finished episode: 232 Reward: 9.0882 total_loss = -0.0150 = -0.0749 + 0.5 * 0.0013 + 0.01 * 5.9239
-----
Finished episode: 233 Reward: 9.1390 total_loss = 0.0985 = 0.0353 + 0.5 * 0.0037 + 0.01 * 6.1406
-----
Finished episode: 234 Reward: 9.1058 total_loss = 0.0961 = 0.0338 + 0.5 * 0.0018 + 0.01 * 6.1438
-----
Finished episode: 235 Reward: 9.0959 total_loss = 0.0674 = 0.0045 + 0.5 * 0.0014 + 0.01 * 6.2110
-----
Finished episode: 236 Reward: 9.1655 total_loss = 0.0687 = 0.0082 + 0.5 * 0.0013 + 0.01 * 5.9830
-----
Finished episode: 237 Reward: 9.1271 total_loss = 0.0364 = -0.0241 + 0.5 * 0.0018 + 0.01 * 5.9578
-----
Finished episode: 238 Reward: 9.1060 total_loss = 0.0265 = -0.0354 + 0.5 * 0.0016 + 0.01 * 6.1039
-----
Finished episode: 239 Reward: 9.1157 total_loss = 0.0628 = -0.0016 + 0.5 * 0.0015 + 0.01 * 6.3673
-----
Finished episode: 240 Reward: 9.1171 total_loss = 0.1047 = 0.0433 + 0.5 * 0.0030 + 0.01 * 5.9959
-----
Finished episode: 241 Reward: 9.1039 total_loss = 0.0239 = -0.0363 + 0.5 * 0.0059 + 0.01 * 5.7306
-----
Finished episode: 242 Reward: 9.1604 total_loss = 0.0785 = 0.0132 + 0.5 * 0.0016 + 0.01 * 6.4490
-----
Finished episode: 243 Reward: 9.1212 total_loss = 0.0803 = 0.0167 + 0.5 * 0.0013 + 0.01 * 6.2931
-----
Finished episode: 244 Reward: 9.1558 total_loss = 0.0213 = -0.0390 + 0.5 * 0.0014 + 0.01 * 5.9655
-----
Finished episode: 245 Reward: 9.1148 total_loss = 0.0333 = -0.0301 + 0.5 * 0.0016 + 0.01 * 6.2654
-----
Finished episode: 246 Reward: 9.0955 total_loss = 0.0369 = -0.0215 + 0.5 * 0.0015 + 0.01 * 5.7654
-----
Finished episode: 247 Reward: 9.1033 total_loss = 0.1751 = 0.1106 + 0.5 * 0.0021 + 0.01 * 6.3401
-----
Finished episode: 248 Reward: 9.1358 total_loss = 0.0941 = 0.0292 + 0.5 * 0.0014 + 0.01 * 6.4285
-----
Finished episode: 249 Reward: 9.0923 total_loss = 0.0728 = 0.0077 + 0.5 * 0.0016 + 0.01 * 6.4376
-----
Finished episode: 250 Reward: 9.0846 total_loss = 0.1115 = 0.0438 + 0.5 * 0.0032 + 0.01 * 6.6076
-----
Finished episode: 251 Reward: 9.1541 total_loss = 0.0285 = -0.0391 + 0.5 * 0.0034 + 0.01 * 6.5868
-----
```

```

Finished episode: 252 Reward: 9.1184 total_loss = 0.0786 = 0.0084 + 0.5 * 0.0022 + 0.01 * 6.9100
-----
Finished episode: 253 Reward: 9.1319 total_loss = 0.0963 = 0.0296 + 0.5 * 0.0014 + 0.01 * 6.5989
-----
Finished episode: 254 Reward: 9.1332 total_loss = 0.0132 = -0.0560 + 0.5 * 0.0017 + 0.01 * 6.8365
-----
Finished episode: 255 Reward: 9.1421 total_loss = 0.0765 = 0.0098 + 0.5 * 0.0044 + 0.01 * 6.4519
-----
Finished episode: 256 Reward: 9.1039 total_loss = 0.0774 = 0.0129 + 0.5 * 0.0038 + 0.01 * 6.2604
-----
Finished episode: 257 Reward: 9.1192 total_loss = 0.0885 = 0.0280 + 0.5 * 0.0013 + 0.01 * 5.9883
-----
Finished episode: 258 Reward: 9.1424 total_loss = 0.1097 = 0.0488 + 0.5 * 0.0029 + 0.01 * 5.9549
-----
Finished episode: 259 Reward: 9.1539 total_loss = 0.0203 = -0.0467 + 0.5 * 0.0033 + 0.01 * 6.5353
-----
Finished episode: 260 Reward: 9.1014 total_loss = 0.0740 = 0.0111 + 0.5 * 0.0016 + 0.01 * 6.2067
-----
Finished episode: 261 Reward: 9.1266 total_loss = 0.0073 = -0.0559 + 0.5 * 0.0015 + 0.01 * 6.2461
-----
Finished episode: 262 Reward: 9.1419 total_loss = 0.0644 = 0.0003 + 0.5 * 0.0012 + 0.01 * 6.3532
-----
Finished episode: 263 Reward: 9.1446 total_loss = 0.0449 = -0.0176 + 0.5 * 0.0025 + 0.01 * 6.1280
-----
Finished episode: 264 Reward: 9.1074 total_loss = 0.0857 = 0.0220 + 0.5 * 0.0012 + 0.01 * 6.3070
-----
Finished episode: 265 Reward: 9.1081 total_loss = 0.0340 = -0.0286 + 0.5 * 0.0014 + 0.01 * 6.1827
-----
Finished episode: 266 Reward: 9.1118 total_loss = 0.0678 = 0.0066 + 0.5 * 0.0014 + 0.01 * 6.0467
-----
Finished episode: 267 Reward: 9.1519 total_loss = -0.0154 = -0.0847 + 0.5 * 0.0043 + 0.01 * 6.7140
-----
Finished episode: 268 Reward: 9.1319 total_loss = 0.1449 = 0.0762 + 0.5 * 0.0025 + 0.01 * 6.7514
-----
Finished episode: 269 Reward: 9.1072 total_loss = 0.0802 = 0.0132 + 0.5 * 0.0025 + 0.01 * 6.5713
-----
Finished episode: 270 Reward: 9.1068 total_loss = 0.0760 = 0.0097 + 0.5 * 0.0016 + 0.01 * 6.5461
-----
Finished episode: 271 Reward: 9.1191 total_loss = 0.0052 = -0.0653 + 0.5 * 0.0022 + 0.01 * 6.9352
-----
Finished episode: 272 Reward: 9.1343 total_loss = 0.1028 = 0.0362 + 0.5 * 0.0014 + 0.01 * 6.5922
-----
Finished episode: 273 Reward: 9.1159 total_loss = 0.1769 = 0.1077 + 0.5 * 0.0061 + 0.01 * 6.6195
-----
Finished episode: 274 Reward: 9.0977 total_loss = 0.1200 = 0.0545 + 0.5 * 0.0014 + 0.01 * 6.4776
-----
Finished episode: 275 Reward: 9.1066 total_loss = 0.0678 = 0.0002 + 0.5 * 0.0019 + 0.01 * 6.6558
-----
Finished episode: 276 Reward: 9.0941 total_loss = 0.0810 = 0.0101 + 0.5 * 0.0024 + 0.01 * 6.9693
-----
Finished episode: 277 Reward: 9.1332 total_loss = 0.0566 = -0.0083 + 0.5 * 0.0017 + 0.01 * 6.4029
-----
Finished episode: 278 Reward: 9.1269 total_loss = 0.1091 = 0.0417 + 0.5 * 0.0016 + 0.01 * 6.6660
-----
Finished episode: 279 Reward: 9.1058 total_loss = 0.0476 = -0.0177 + 0.5 * 0.0024 + 0.01 * 6.4123
-----
Finished episode: 280 Reward: 9.1161 total_loss = 0.0444 = -0.0244 + 0.5 * 0.0024 + 0.01 * 6.7598
-----
Finished episode: 281 Reward: 9.1068 total_loss = 0.0197 = -0.0486 + 0.5 * 0.0022 + 0.01 * 6.7180
-----
Finished episode: 282 Reward: 9.1135 total_loss = 0.0492 = -0.0203 + 0.5 * 0.0013 + 0.01 * 6.8791
-----
Finished episode: 283 Reward: 9.1137 total_loss = 0.0689 = 0.0056 + 0.5 * 0.0017 + 0.01 * 6.2430
-----
Finished episode: 284 Reward: 9.1246 total_loss = 0.1065 = 0.0396 + 0.5 * 0.0011 + 0.01 * 6.6309
-----
Finished episode: 285 Reward: 9.1372 total_loss = 0.1099 = 0.0435 + 0.5 * 0.0013 + 0.01 * 6.5696
-----
Finished episode: 286 Reward: 9.1247 total_loss = 0.0876 = 0.0226 + 0.5 * 0.0015 + 0.01 * 6.4230
-----
Finished episode: 287 Reward: 9.1210 total_loss = 0.0091 = -0.0581 + 0.5 * 0.0013 + 0.01 * 6.6556
-----
Finished episode: 288 Reward: 9.0916 total_loss = 0.1472 = 0.0791 + 0.5 * 0.0031 + 0.01 * 6.6511
-----
Finished episode: 289 Reward: 9.1193 total_loss = 0.0559 = -0.0126 + 0.5 * 0.0026 + 0.01 * 6.7228
-----
Finished episode: 290 Reward: 9.1148 total_loss = 0.0296 = -0.0341 + 0.5 * 0.0046 + 0.01 * 6.1394
-----
Finished episode: 291 Reward: 9.1070 total_loss = 0.0848 = 0.0171 + 0.5 * 0.0014 + 0.01 * 6.7001
-----
Finished episode: 292 Reward: 9.1499 total_loss = 0.0670 = 0.0003 + 0.5 * 0.0013 + 0.01 * 6.6068
-----
Finished episode: 293 Reward: 9.1410 total_loss = 0.0189 = -0.0463 + 0.5 * 0.0014 + 0.01 * 6.4453
-----
Finished episode: 294 Reward: 9.1281 total_loss = 0.0417 = -0.0301 + 0.5 * 0.0020 + 0.01 * 7.0768
-----
Finished episode: 295 Reward: 9.0933 total_loss = 0.0831 = 0.0116 + 0.5 * 0.0017 + 0.01 * 7.0597
-----
Finished episode: 296 Reward: 9.0921 total_loss = 0.0502 = -0.0178 + 0.5 * 0.0014 + 0.01 * 6.7326
-----
Finished episode: 297 Reward: 9.0779 total_loss = 0.0261 = -0.0429 + 0.5 * 0.0012 + 0.01 * 6.8347
-----

```

In [15]...

```

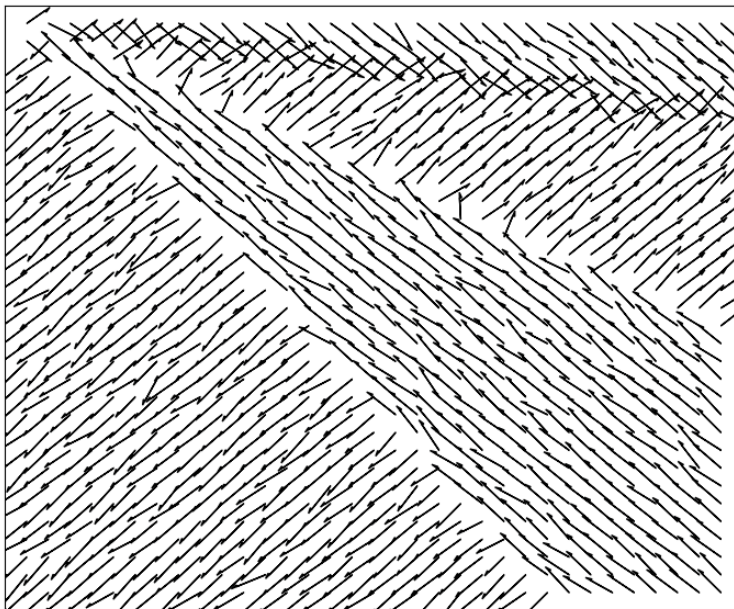
# This section is used to visualize your learned policy
from torch import Tensor
output_i = np.zeros((33,33))
output_j = np.zeros((33,33))
output_i_m = np.zeros((33,33))
output_j_m = np.zeros((33,33))
value_ij = np.zeros((33,33))
for i in range(33):
    for j in range(33):
        states = Tensor(np.asarray([i,j])).float().unsqueeze(0)

        '''
        you need to revise the following line,
        to fit your policy/network outputs
        '''

        action_mean, action_logstd, value = network(states)
        action, logproba = network.select_action(action_mean, action_logstd)
        action = action.cpu().data.numpy()[0]
        logproba = logproba.cpu().data.numpy()[0]
#         action, value = policy(states)
        output_i[i,j] = action[0]
        output_j[i,j] = action[1]
        value_ij[i,j] = value

```

```
plt.figure(figsize= (5,5))
for i in range(33):
    for j in range(33):
        plt.arrow(j,-i,output_j[i,j],-output_i[i,j],head_width=0.2,shape='left')
xlim(-1,33)
ylim(-33,1)
yticks([2*i-32 for i in range(17)], [2*i for i in range(17)])
plt.xticks([])
plt.yticks([])
```



Out[15... ([], [])

## TD3-FourWayGridWorld

In [16... # The following scripts run the TD3 algorithm.

```
alias = 'td3'
ENV_NAME = 'FourWayGridWorld'

import matplotlib.pyplot as plt
import numpy as np
import torch
import gym
import argparse
import os
import torch.nn.functional as F
import utils
import TD3
import DDPG

def eval_policy(policy, eval_episodes=10):
    eval_env = FourWayGridWorld(33)

    avg_reward = 0.
    for _ in range(eval_episodes):
        state, done = eval_env.reset(), False
        while not done:
            action = policy.select_action(np.array(state))
            state, reward, done = eval_env.step(action)
            avg_reward += reward

    avg_reward /= eval_episodes
    #print("-----")
    #print(f"Evaluation over {eval_episodes} episodes: {avg_reward:.3f}")
    #print("-----")
    return avg_reward

env = FourWayGridWorld(33)
torch.manual_seed(0)
np.random.seed(0)

state_dim = env.observation_space.shape[0]
action_dim = env.action_space.shape[0]
max_action = 1

args_policy_noise = 0.001
args_noise_clip = 0.5
args_policy_freq = 2
args_max_timesteps = 100000
args_expl_noise = 0.1
args_batch_size = 25
args_eval_freq = 1000
args_start_timesteps = 0

kwargs = {
    "state_dim": state_dim,
```

```

        "action_dim": action_dim,
        "max_action": max_action,
        "discount": 0.99,
        "tau": 0.005
    }

args_policy = 'TD3'

if args_policy == "TD3":
    # Target policy smoothing is scaled wrt the action scale
    kwargs["policy_noise"] = args_policy_noise * max_action
    kwargs["noise_clip"] = args_noise_clip * max_action
    kwargs["policy_freq"] = args_policy_freq
    policy = TD3.TD3(**kwargs)
elif args_policy == "OurDDPG":
    policy = OurDDPG.DDPG(**kwargs)
elif args_policy == "DDPG":
    policy = DDPG.DDPG(**kwargs)
replay_buffer = utils.ReplayBuffer(state_dim, action_dim)

# Evaluate untrained policy
evaluations = [eval_policy(policy)]

state, done = env.reset(), False
episode_reward = 0
episode_timesteps = 0
episode_num = 0
counter = 0
msk_list = []
temp_curve = [eval_policy(policy)]
temp_val = []
for t in range(int(args_max_timesteps)):
    episode_timesteps += 1
    counter += 1
    # Select action randomly or according to policy
    if t < args_start_timesteps:
        action = np.random.uniform(-max_action, max_action, action_dim)
    else:
        # e-greedy strategy
        if np.random.uniform(0,1) < 0.1:
            action = np.random.uniform(-max_action, max_action, action_dim)
        else:
            action = (
                policy.select_action(np.array(state))
                + np.random.normal(0, max_action * args_expl_noise, size=action_dim)
            ).clip(-max_action, max_action)

    # Perform action
    next_state, reward, done = env.step(action)
    done_bool = float(done) if episode_timesteps < 2*env.N else 0

    replay_buffer.add(state, action, next_state, reward, done_bool)

    state = next_state
    episode_reward += reward

    if t >= args_start_timesteps:
        'TD3'
        last_val = 999.
        patient = 5
        for i in range(1):
            policy.train(replay_buffer, args_batch_size)

# Train agent after collecting sufficient data
if done:
    print(f"Total T: {t+1} Episode Num: {episode_num+1} Episode T: {episode_timesteps} Reward: {episode_reward:.3f}")
    msk_list = []
    state, done = env.reset(), False
    episode_reward = 0
    episode_timesteps = 0
    episode_num += 1

# Evaluate episode
if (t + 1) % args_eval_freq == 0:
    evaluations.append(eval_policy(policy))
    print('recent Evaluation:', evaluations[-1])
    np.save('results/FourWayGridWorld_evaluations_alias{}_ENV{}'.format(alias, ENV_NAME), evaluations)

Total T: 66 Episode Num: 1 Episode T: 66 Reward: -6.600
Total T: 132 Episode Num: 2 Episode T: 66 Reward: -6.600
Total T: 198 Episode Num: 3 Episode T: 66 Reward: -6.600
Total T: 236 Episode Num: 4 Episode T: 38 Reward: 6.300
Total T: 251 Episode Num: 5 Episode T: 15 Reward: 8.600
Total T: 303 Episode Num: 6 Episode T: 52 Reward: 4.900
Total T: 369 Episode Num: 7 Episode T: 66 Reward: -6.600
Total T: 435 Episode Num: 8 Episode T: 66 Reward: -6.600
Total T: 449 Episode Num: 9 Episode T: 14 Reward: 8.700
Total T: 468 Episode Num: 10 Episode T: 19 Reward: 8.200
Total T: 534 Episode Num: 11 Episode T: 66 Reward: -6.600
Total T: 600 Episode Num: 12 Episode T: 66 Reward: -6.600
Total T: 608 Episode Num: 13 Episode T: 8 Reward: 9.300
Total T: 674 Episode Num: 14 Episode T: 66 Reward: -6.600
Total T: 740 Episode Num: 15 Episode T: 66 Reward: -6.600
Total T: 806 Episode Num: 16 Episode T: 66 Reward: -6.600
Total T: 872 Episode Num: 17 Episode T: 66 Reward: -6.600
Total T: 938 Episode Num: 18 Episode T: 66 Reward: -6.600
Total T: 973 Episode Num: 19 Episode T: 35 Reward: 6.600
Total T: 984 Episode Num: 20 Episode T: 11 Reward: 9.000
recent Evaluation: 1.0400000000000076
Total T: 1050 Episode Num: 21 Episode T: 66 Reward: -6.600
Total T: 1116 Episode Num: 22 Episode T: 66 Reward: -6.600
Total T: 1182 Episode Num: 23 Episode T: 66 Reward: -6.600
Total T: 1248 Episode Num: 24 Episode T: 66 Reward: -6.600
Total T: 1262 Episode Num: 25 Episode T: 14 Reward: 8.700
Total T: 1269 Episode Num: 26 Episode T: 7 Reward: 9.400
Total T: 1335 Episode Num: 27 Episode T: 66 Reward: -6.600
Total T: 1401 Episode Num: 28 Episode T: 66 Reward: -6.600
Total T: 1425 Episode Num: 29 Episode T: 24 Reward: 7.700
Total T: 1491 Episode Num: 30 Episode T: 66 Reward: -6.600
Total T: 1505 Episode Num: 31 Episode T: 14 Reward: 8.700
Total T: 1526 Episode Num: 32 Episode T: 21 Reward: 8.000
Total T: 1543 Episode Num: 33 Episode T: 17 Reward: 8.400
Total T: 1609 Episode Num: 34 Episode T: 66 Reward: -6.600
Total T: 1675 Episode Num: 35 Episode T: 66 Reward: -6.600

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Total T: 1706 Episode Num: 36 Episode T: 31 Reward: 7.000
Total T: 1717 Episode Num: 37 Episode T: 11 Reward: 9.000
Total T: 1783 Episode Num: 38 Episode T: 66 Reward: -6.600
Total T: 1849 Episode Num: 39 Episode T: 66 Reward: -6.600
Total T: 1870 Episode Num: 40 Episode T: 21 Reward: 8.000
Total T: 1878 Episode Num: 41 Episode T: 8 Reward: 9.300
Total T: 1889 Episode Num: 42 Episode T: 11 Reward: 9.000
Total T: 1909 Episode Num: 43 Episode T: 20 Reward: 8.100
Total T: 1954 Episode Num: 44 Episode T: 45 Reward: 5.600
recent Evaluation: 1.099999999999928
Total T: 2020 Episode Num: 45 Episode T: 66 Reward: -6.600
Total T: 2034 Episode Num: 46 Episode T: 14 Reward: 8.700
Total T: 2096 Episode Num: 47 Episode T: 62 Reward: 3.900
Total T: 2162 Episode Num: 48 Episode T: 66 Reward: -6.600
Total T: 2228 Episode Num: 49 Episode T: 66 Reward: -6.600
Total T: 2294 Episode Num: 50 Episode T: 66 Reward: -6.600
Total T: 2313 Episode Num: 51 Episode T: 19 Reward: 8.200
Total T: 2350 Episode Num: 52 Episode T: 37 Reward: 6.400
Total T: 2388 Episode Num: 53 Episode T: 38 Reward: 6.300
Total T: 2454 Episode Num: 54 Episode T: 66 Reward: -6.600
Total T: 2520 Episode Num: 55 Episode T: 66 Reward: -6.600
Total T: 2586 Episode Num: 56 Episode T: 66 Reward: -6.600
Total T: 2601 Episode Num: 57 Episode T: 15 Reward: 8.600
Total T: 2667 Episode Num: 58 Episode T: 66 Reward: -6.600
Total T: 2682 Episode Num: 59 Episode T: 15 Reward: 8.600
Total T: 2697 Episode Num: 60 Episode T: 15 Reward: 8.600
Total T: 2701 Episode Num: 61 Episode T: 4 Reward: 9.700
Total T: 2734 Episode Num: 62 Episode T: 33 Reward: 6.800
Total T: 2744 Episode Num: 63 Episode T: 10 Reward: 9.100
Total T: 2765 Episode Num: 64 Episode T: 21 Reward: 8.000
Total T: 2792 Episode Num: 65 Episode T: 27 Reward: 7.400
Total T: 2810 Episode Num: 66 Episode T: 18 Reward: 8.300
Total T: 2834 Episode Num: 67 Episode T: 24 Reward: 7.700
Total T: 2844 Episode Num: 68 Episode T: 10 Reward: 9.100
Total T: 2862 Episode Num: 69 Episode T: 18 Reward: 8.300
Total T: 2875 Episode Num: 70 Episode T: 13 Reward: 8.800
Total T: 2879 Episode Num: 71 Episode T: 4 Reward: 9.700
Total T: 2892 Episode Num: 72 Episode T: 13 Reward: 8.800
Total T: 2958 Episode Num: 73 Episode T: 66 Reward: -6.600
recent Evaluation: -3.5900000000000345
Total T: 3001 Episode Num: 74 Episode T: 43 Reward: 5.800
Total T: 3028 Episode Num: 75 Episode T: 27 Reward: 7.400
Total T: 3047 Episode Num: 76 Episode T: 19 Reward: 8.200
Total T: 3067 Episode Num: 77 Episode T: 20 Reward: 8.100
Total T: 3102 Episode Num: 78 Episode T: 35 Reward: 6.600
Total T: 3116 Episode Num: 79 Episode T: 14 Reward: 8.700
Total T: 3182 Episode Num: 80 Episode T: 66 Reward: -6.600
Total T: 3248 Episode Num: 81 Episode T: 66 Reward: -6.600
Total T: 3277 Episode Num: 82 Episode T: 29 Reward: 7.200
Total T: 3280 Episode Num: 83 Episode T: 3 Reward: 9.800
Total T: 3346 Episode Num: 84 Episode T: 66 Reward: -6.600
Total T: 3360 Episode Num: 85 Episode T: 14 Reward: 8.700
Total T: 3373 Episode Num: 86 Episode T: 13 Reward: 8.800
Total T: 3387 Episode Num: 87 Episode T: 14 Reward: 8.700
Total T: 3391 Episode Num: 88 Episode T: 4 Reward: 9.700
Total T: 3402 Episode Num: 89 Episode T: 11 Reward: 9.000
Total T: 3468 Episode Num: 90 Episode T: 66 Reward: -6.600
Total T: 3470 Episode Num: 91 Episode T: 2 Reward: 9.900
Total T: 3536 Episode Num: 92 Episode T: 66 Reward: -6.600
Total T: 3553 Episode Num: 93 Episode T: 17 Reward: 8.400
Total T: 3619 Episode Num: 94 Episode T: 66 Reward: -6.600
Total T: 3628 Episode Num: 95 Episode T: 9 Reward: 9.200
Total T: 3694 Episode Num: 96 Episode T: 66 Reward: -6.600
Total T: 3703 Episode Num: 97 Episode T: 9 Reward: 9.200
Total T: 3769 Episode Num: 98 Episode T: 66 Reward: -6.600
Total T: 3835 Episode Num: 99 Episode T: 66 Reward: -6.600
Total T: 3901 Episode Num: 100 Episode T: 66 Reward: -6.600
Total T: 3967 Episode Num: 101 Episode T: 66 Reward: -6.600
recent Evaluation: 3.879999999999986
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Total T: 4099 Episode Num: 103 Episode T: 66 Reward: -6.600
Total T: 4109 Episode Num: 104 Episode T: 10 Reward: 9.100
Total T: 4149 Episode Num: 105 Episode T: 40 Reward: 6.100
Total T: 4215 Episode Num: 106 Episode T: 66 Reward: -6.600
Total T: 4238 Episode Num: 107 Episode T: 23 Reward: 7.800
Total T: 4249 Episode Num: 108 Episode T: 11 Reward: 9.000
Total T: 4258 Episode Num: 109 Episode T: 9 Reward: 9.200
Total T: 4268 Episode Num: 110 Episode T: 10 Reward: 9.100
Total T: 4310 Episode Num: 111 Episode T: 42 Reward: 5.900
Total T: 4376 Episode Num: 112 Episode T: 66 Reward: -6.600
Total T: 4417 Episode Num: 113 Episode T: 41 Reward: 6.000
Total T: 4442 Episode Num: 114 Episode T: 25 Reward: 7.600
Total T: 4454 Episode Num: 115 Episode T: 12 Reward: 8.900
Total T: 4464 Episode Num: 116 Episode T: 10 Reward: 9.100
Total T: 4477 Episode Num: 117 Episode T: 13 Reward: 8.800
Total T: 4543 Episode Num: 118 Episode T: 66 Reward: -6.600
Total T: 4552 Episode Num: 119 Episode T: 9 Reward: 9.200
Total T: 4558 Episode Num: 120 Episode T: 6 Reward: 9.500
Total T: 4624 Episode Num: 121 Episode T: 66 Reward: -6.600
Total T: 4690 Episode Num: 122 Episode T: 66 Reward: -6.600
Total T: 4729 Episode Num: 123 Episode T: 39 Reward: 6.200
Total T: 4756 Episode Num: 124 Episode T: 27 Reward: 7.400
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Total T: 4828 Episode Num: 128 Episode T: 24 Reward: 7.700
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Total T: 4928 Episode Num: 132 Episode T: 14 Reward: 8.700
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recent Evaluation: -0.4099999999999925
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Total T: 5092 Episode Num: 136 Episode T: 62 Reward: 3.900
Total T: 5107 Episode Num: 137 Episode T: 15 Reward: 8.600
Total T: 5138 Episode Num: 138 Episode T: 31 Reward: 7.000
Total T: 5147 Episode Num: 139 Episode T: 9 Reward: 9.200
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Total T: 5246 Episode Num: 141 Episode T: 51 Reward: 5.000
Total T: 5267 Episode Num: 142 Episode T: 21 Reward: 8.000
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Total T: 5352 Episode Num: 144 Episode T: 66 Reward: -6.600
Total T: 5408 Episode Num: 145 Episode T: 56 Reward: 4.500
Total T: 5474 Episode Num: 146 Episode T: 66 Reward: -6.600
Total T: 5489 Episode Num: 147 Episode T: 15 Reward: 8.600

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Total T: 5555 Episode Num: 148 Episode T: 66 Reward: -6.600  
Total T: 5560 Episode Num: 149 Episode T: 5 Reward: 9.600  
Total T: 5565 Episode Num: 150 Episode T: 5 Reward: 9.600  
Total T: 5577 Episode Num: 151 Episode T: 12 Reward: 8.900  
Total T: 5615 Episode Num: 152 Episode T: 38 Reward: 6.300  
Total T: 5650 Episode Num: 153 Episode T: 35 Reward: 6.600  
Total T: 5675 Episode Num: 154 Episode T: 25 Reward: 7.600  
Total T: 5687 Episode Num: 155 Episode T: 12 Reward: 8.900  
Total T: 5738 Episode Num: 156 Episode T: 51 Reward: 5.000  
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Total T: 5809 Episode Num: 158 Episode T: 5 Reward: 9.600  
Total T: 5825 Episode Num: 159 Episode T: 16 Reward: 8.500  
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Total T: 5896 Episode Num: 161 Episode T: 25 Reward: 7.600  
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Total T: 5941 Episode Num: 164 Episode T: 23 Reward: 7.800  
Total T: 5957 Episode Num: 165 Episode T: 16 Reward: 8.500  
Total T: 5972 Episode Num: 166 Episode T: 15 Reward: 8.600  
Total T: 5990 Episode Num: 167 Episode T: 18 Reward: 8.300  
recent Evaluation: 3.709999999999957  
Total T: 6020 Episode Num: 168 Episode T: 30 Reward: 7.100  
Total T: 6027 Episode Num: 169 Episode T: 7 Reward: 9.400  
Total T: 6062 Episode Num: 170 Episode T: 35 Reward: 6.600  
Total T: 6081 Episode Num: 171 Episode T: 19 Reward: 8.200  
Total T: 6083 Episode Num: 172 Episode T: 2 Reward: 9.900  
Total T: 6102 Episode Num: 173 Episode T: 19 Reward: 8.200  
Total T: 6168 Episode Num: 174 Episode T: 66 Reward: 3.500  
Total T: 6178 Episode Num: 175 Episode T: 10 Reward: 9.100  
Total T: 6211 Episode Num: 176 Episode T: 33 Reward: 6.800  
Total T: 6217 Episode Num: 177 Episode T: 6 Reward: 9.500  
Total T: 6283 Episode Num: 178 Episode T: 66 Reward: -6.600  
Total T: 6334 Episode Num: 179 Episode T: 51 Reward: 5.000  
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Total T: 6373 Episode Num: 181 Episode T: 27 Reward: 7.400  
Total T: 6388 Episode Num: 182 Episode T: 15 Reward: 8.600  
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Total T: 6424 Episode Num: 184 Episode T: 20 Reward: 8.100  
Total T: 6438 Episode Num: 185 Episode T: 14 Reward: 8.700  
Total T: 6504 Episode Num: 186 Episode T: 66 Reward: -6.600  
Total T: 6570 Episode Num: 187 Episode T: 66 Reward: -6.600  
Total T: 6636 Episode Num: 188 Episode T: 66 Reward: -6.600  
Total T: 6702 Episode Num: 189 Episode T: 66 Reward: -6.600  
Total T: 6768 Episode Num: 190 Episode T: 66 Reward: -6.600  
Total T: 6834 Episode Num: 191 Episode T: 66 Reward: -6.600  
Total T: 6853 Episode Num: 192 Episode T: 19 Reward: 8.200  
Total T: 6863 Episode Num: 193 Episode T: 10 Reward: 9.100  
Total T: 6868 Episode Num: 194 Episode T: 5 Reward: 9.600  
Total T: 6934 Episode Num: 195 Episode T: 66 Reward: -6.600  
Total T: 7000 Episode Num: 196 Episode T: 66 Reward: -6.600  
recent Evaluation: -3.5000000000000284  
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Total T: 7132 Episode Num: 198 Episode T: 66 Reward: -6.600  
Total T: 7198 Episode Num: 199 Episode T: 66 Reward: -6.600  
Total T: 7264 Episode Num: 200 Episode T: 66 Reward: -6.600  
Total T: 7330 Episode Num: 201 Episode T: 66 Reward: -6.600  
Total T: 7396 Episode Num: 202 Episode T: 66 Reward: -6.600  
Total T: 7462 Episode Num: 203 Episode T: 66 Reward: -6.600  
Total T: 7528 Episode Num: 204 Episode T: 66 Reward: -6.600  
Total T: 7594 Episode Num: 205 Episode T: 66 Reward: -6.600  
Total T: 7660 Episode Num: 206 Episode T: 66 Reward: -6.600  
Total T: 7726 Episode Num: 207 Episode T: 66 Reward: -6.600  
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Total T: 7915 Episode Num: 212 Episode T: 8 Reward: 9.300  
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recent Evaluation: -0.39999999999999675  
Total T: 8047 Episode Num: 214 Episode T: 66 Reward: -6.600  
Total T: 8113 Episode Num: 215 Episode T: 66 Reward: -6.600  
Total T: 8179 Episode Num: 216 Episode T: 66 Reward: -6.600  
Total T: 8182 Episode Num: 217 Episode T: 3 Reward: 9.800  
Total T: 8248 Episode Num: 218 Episode T: 66 Reward: -6.600  
Total T: 8314 Episode Num: 219 Episode T: 66 Reward: -6.600  
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Total T: 8446 Episode Num: 221 Episode T: 66 Reward: -6.600  
Total T: 8462 Episode Num: 222 Episode T: 16 Reward: 8.500  
Total T: 8481 Episode Num: 223 Episode T: 19 Reward: 8.200  
Total T: 8491 Episode Num: 224 Episode T: 10 Reward: 9.100  
Total T: 8557 Episode Num: 225 Episode T: 66 Reward: -6.600  
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Total T: 8755 Episode Num: 228 Episode T: 66 Reward: -6.600  
Total T: 8766 Episode Num: 229 Episode T: 11 Reward: 9.000  
Total T: 8780 Episode Num: 230 Episode T: 14 Reward: 8.700  
Total T: 8796 Episode Num: 231 Episode T: 16 Reward: 8.500  
Total T: 8862 Episode Num: 232 Episode T: 66 Reward: -6.600  
Total T: 8928 Episode Num: 233 Episode T: 66 Reward: -6.600  
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recent Evaluation: -3.5600000000000436  
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Total T: 9662 Episode Num: 250 Episode T: 66 Reward: -6.600  
Total T: 9728 Episode Num: 251 Episode T: 66 Reward: -6.600  
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Total T: 9805 Episode Num: 253 Episode T: 11 Reward: 9.000  
Total T: 9871 Episode Num: 254 Episode T: 66 Reward: -6.600  
Total T: 9937 Episode Num: 255 Episode T: 66 Reward: -6.600  
recent Evaluation: -5.0600000000000043  
Total T: 10003 Episode Num: 256 Episode T: 66 Reward: -6.600  
Total T: 10015 Episode Num: 257 Episode T: 12 Reward: 8.900  
Total T: 10081 Episode Num: 258 Episode T: 66 Reward: -6.600

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Total T: 10089 Episode Num: 259 Episode T: 8 Reward: 9.300
Total T: 10094 Episode Num: 260 Episode T: 5 Reward: 9.600
Total T: 10160 Episode Num: 261 Episode T: 66 Reward: -6.600
Total T: 10226 Episode Num: 262 Episode T: 66 Reward: -6.600
Total T: 10292 Episode Num: 263 Episode T: 66 Reward: -6.600
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Total T: 10761 Episode Num: 271 Episode T: 66 Reward: -6.600
Total T: 10771 Episode Num: 272 Episode T: 10 Reward: 9.100
Total T: 10837 Episode Num: 273 Episode T: 66 Reward: -6.600
Total T: 10839 Episode Num: 274 Episode T: 2 Reward: 9.900
Total T: 10905 Episode Num: 275 Episode T: 66 Reward: -6.600
Total T: 10914 Episode Num: 276 Episode T: 9 Reward: 9.200
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recent Evaluation: -3.4400000000000204
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Total T: 11721 Episode Num: 289 Episode T: 66 Reward: -6.600
Total T: 11741 Episode Num: 290 Episode T: 20 Reward: 8.100
Total T: 11807 Episode Num: 291 Episode T: 66 Reward: -6.600
Total T: 11873 Episode Num: 292 Episode T: 66 Reward: -6.600
Total T: 11939 Episode Num: 293 Episode T: 66 Reward: -6.600
recent Evaluation: -3.4500000000000215
Total T: 12005 Episode Num: 294 Episode T: 66 Reward: -6.600
Total T: 12071 Episode Num: 295 Episode T: 66 Reward: -6.600
Total T: 12083 Episode Num: 296 Episode T: 12 Reward: 8.900
Total T: 12149 Episode Num: 297 Episode T: 66 Reward: -6.600
Total T: 12184 Episode Num: 298 Episode T: 35 Reward: 6.600
Total T: 12250 Episode Num: 299 Episode T: 66 Reward: -6.600
Total T: 12256 Episode Num: 300 Episode T: 6 Reward: 9.500
Total T: 12273 Episode Num: 301 Episode T: 17 Reward: 8.400
Total T: 12276 Episode Num: 302 Episode T: 3 Reward: 9.800
Total T: 12342 Episode Num: 303 Episode T: 66 Reward: -6.600
Total T: 12408 Episode Num: 304 Episode T: 66 Reward: -6.600
Total T: 12474 Episode Num: 305 Episode T: 66 Reward: -6.600
Total T: 12540 Episode Num: 306 Episode T: 66 Reward: -6.600
Total T: 12606 Episode Num: 307 Episode T: 66 Reward: -6.600
Total T: 12672 Episode Num: 308 Episode T: 66 Reward: -6.600
Total T: 12738 Episode Num: 309 Episode T: 66 Reward: -6.600
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Total T: 12939 Episode Num: 313 Episode T: 66 Reward: -6.600
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recent Evaluation: 2.8600000000000008
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Total T: 13081 Episode Num: 316 Episode T: 66 Reward: -6.600
Total T: 13147 Episode Num: 317 Episode T: 66 Reward: -6.600
Total T: 13213 Episode Num: 318 Episode T: 66 Reward: -6.600
Total T: 13279 Episode Num: 319 Episode T: 66 Reward: -6.600
Total T: 13345 Episode Num: 320 Episode T: 66 Reward: -6.600
Total T: 13411 Episode Num: 321 Episode T: 66 Reward: -6.600
Total T: 13477 Episode Num: 322 Episode T: 66 Reward: -6.600
Total T: 13543 Episode Num: 323 Episode T: 66 Reward: -6.600
Total T: 13563 Episode Num: 324 Episode T: 20 Reward: 8.100
Total T: 13629 Episode Num: 325 Episode T: 66 Reward: -6.600
Total T: 13695 Episode Num: 326 Episode T: 66 Reward: -6.600
Total T: 13721 Episode Num: 327 Episode T: 26 Reward: 7.500
Total T: 13754 Episode Num: 328 Episode T: 33 Reward: 6.800
Total T: 13820 Episode Num: 329 Episode T: 66 Reward: -6.600
Total T: 13886 Episode Num: 330 Episode T: 66 Reward: -6.600
Total T: 13952 Episode Num: 331 Episode T: 66 Reward: -6.600
recent Evaluation: 1.3500000000000052
Total T: 14018 Episode Num: 332 Episode T: 66 Reward: -6.600
Total T: 14023 Episode Num: 333 Episode T: 5 Reward: 9.600
Total T: 14089 Episode Num: 334 Episode T: 66 Reward: -6.600
Total T: 14155 Episode Num: 335 Episode T: 66 Reward: -6.600
Total T: 14221 Episode Num: 336 Episode T: 66 Reward: -6.600
Total T: 14287 Episode Num: 337 Episode T: 66 Reward: -6.600
Total T: 14290 Episode Num: 338 Episode T: 3 Reward: 9.800
Total T: 14356 Episode Num: 339 Episode T: 66 Reward: -6.600
Total T: 14422 Episode Num: 340 Episode T: 66 Reward: -6.600
Total T: 14462 Episode Num: 341 Episode T: 40 Reward: 6.100
Total T: 14488 Episode Num: 342 Episode T: 26 Reward: 7.500
Total T: 14554 Episode Num: 343 Episode T: 66 Reward: -6.600
Total T: 14620 Episode Num: 344 Episode T: 66 Reward: -6.600
Total T: 14633 Episode Num: 345 Episode T: 13 Reward: 8.800
Total T: 14699 Episode Num: 346 Episode T: 66 Reward: -6.600
Total T: 14765 Episode Num: 347 Episode T: 66 Reward: -6.600
Total T: 14831 Episode Num: 348 Episode T: 66 Reward: -6.600
Total T: 14832 Episode Num: 349 Episode T: 1 Reward: 10.000
Total T: 14840 Episode Num: 350 Episode T: 8 Reward: 9.300
Total T: 14906 Episode Num: 351 Episode T: 66 Reward: -6.600
Total T: 14926 Episode Num: 352 Episode T: 20 Reward: 8.100
Total T: 14992 Episode Num: 353 Episode T: 66 Reward: -6.600
Total T: 14997 Episode Num: 354 Episode T: 5 Reward: 9.600
recent Evaluation: -3.5100000000000513
Total T: 15005 Episode Num: 355 Episode T: 8 Reward: 9.300
Total T: 15071 Episode Num: 356 Episode T: 66 Reward: -6.600
Total T: 15095 Episode Num: 357 Episode T: 24 Reward: 7.700
Total T: 15161 Episode Num: 358 Episode T: 66 Reward: -6.600
Total T: 15227 Episode Num: 359 Episode T: 66 Reward: -6.600
Total T: 15293 Episode Num: 360 Episode T: 66 Reward: -6.600
Total T: 15359 Episode Num: 361 Episode T: 66 Reward: -6.600
Total T: 15373 Episode Num: 362 Episode T: 14 Reward: 8.700
Total T: 15439 Episode Num: 363 Episode T: 66 Reward: -6.600
Total T: 15505 Episode Num: 364 Episode T: 66 Reward: -6.600
Total T: 15549 Episode Num: 365 Episode T: 44 Reward: 5.700
Total T: 15615 Episode Num: 366 Episode T: 66 Reward: -6.600
Total T: 15681 Episode Num: 367 Episode T: 66 Reward: -6.600
Total T: 15747 Episode Num: 368 Episode T: 66 Reward: -6.600
Total T: 15758 Episode Num: 369 Episode T: 11 Reward: 9.000

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Total T: 15779 Episode Num: 370 Episode T: 21 Reward: 8.000
Total T: 15845 Episode Num: 371 Episode T: 66 Reward: -6.600
Total T: 15851 Episode Num: 372 Episode T: 6 Reward: 9.500
Total T: 15917 Episode Num: 373 Episode T: 66 Reward: -6.600
Total T: 15937 Episode Num: 374 Episode T: 20 Reward: 8.100
Total T: 15956 Episode Num: 375 Episode T: 19 Reward: 8.200
Total T: 15972 Episode Num: 376 Episode T: 16 Reward: 8.500
recent Evaluation: -0.3699999999999245
Total T: 16038 Episode Num: 377 Episode T: 66 Reward: -6.600
Total T: 16039 Episode Num: 378 Episode T: 1 Reward: 10.000
Total T: 16105 Episode Num: 379 Episode T: 66 Reward: -6.600
Total T: 16119 Episode Num: 380 Episode T: 14 Reward: 8.700
Total T: 16134 Episode Num: 381 Episode T: 15 Reward: 8.600
Total T: 16200 Episode Num: 382 Episode T: 66 Reward: -6.600
Total T: 16202 Episode Num: 383 Episode T: 2 Reward: 9.900
Total T: 16239 Episode Num: 384 Episode T: 37 Reward: 6.400
Total T: 16250 Episode Num: 385 Episode T: 11 Reward: 9.000
Total T: 16259 Episode Num: 386 Episode T: 9 Reward: 9.200
Total T: 16273 Episode Num: 387 Episode T: 14 Reward: 8.700
Total T: 16320 Episode Num: 388 Episode T: 47 Reward: 5.400
Total T: 16386 Episode Num: 389 Episode T: 66 Reward: -6.600
Total T: 16452 Episode Num: 390 Episode T: 66 Reward: -6.600
Total T: 16518 Episode Num: 391 Episode T: 66 Reward: -6.600
Total T: 16529 Episode Num: 392 Episode T: 11 Reward: 9.000
Total T: 16536 Episode Num: 393 Episode T: 7 Reward: 9.400
Total T: 16549 Episode Num: 394 Episode T: 13 Reward: 8.800
Total T: 16615 Episode Num: 395 Episode T: 66 Reward: -6.600
Total T: 16660 Episode Num: 396 Episode T: 45 Reward: 5.600
Total T: 16666 Episode Num: 397 Episode T: 6 Reward: 9.500
Total T: 16732 Episode Num: 398 Episode T: 66 Reward: -6.600
Total T: 16798 Episode Num: 399 Episode T: 66 Reward: -6.600
Total T: 16821 Episode Num: 400 Episode T: 23 Reward: 7.800
Total T: 16887 Episode Num: 401 Episode T: 66 Reward: -6.600
Total T: 16953 Episode Num: 402 Episode T: 66 Reward: -6.600
Total T: 16984 Episode Num: 403 Episode T: 31 Reward: 7.000
recent Evaluation: 1.0900000000000012
Total T: 17050 Episode Num: 404 Episode T: 66 Reward: -6.600
Total T: 17116 Episode Num: 405 Episode T: 66 Reward: -6.600
Total T: 17182 Episode Num: 406 Episode T: 66 Reward: -6.600
Total T: 17205 Episode Num: 407 Episode T: 23 Reward: 7.800
Total T: 17271 Episode Num: 408 Episode T: 66 Reward: -6.600
Total T: 17283 Episode Num: 409 Episode T: 12 Reward: 8.900
Total T: 17317 Episode Num: 410 Episode T: 34 Reward: 6.700
Total T: 17344 Episode Num: 411 Episode T: 27 Reward: 7.400
Total T: 17410 Episode Num: 412 Episode T: 66 Reward: -6.600
Total T: 17422 Episode Num: 413 Episode T: 12 Reward: 8.900
Total T: 17488 Episode Num: 414 Episode T: 66 Reward: -6.600
Total T: 17496 Episode Num: 415 Episode T: 8 Reward: 9.300
Total T: 17512 Episode Num: 416 Episode T: 16 Reward: 8.500
Total T: 17521 Episode Num: 417 Episode T: 9 Reward: 9.200
Total T: 17535 Episode Num: 418 Episode T: 14 Reward: 8.700
Total T: 17601 Episode Num: 419 Episode T: 66 Reward: -6.600
Total T: 17667 Episode Num: 420 Episode T: 66 Reward: -6.600
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Total T: 17843 Episode Num: 425 Episode T: 11 Reward: 9.000
Total T: 17868 Episode Num: 426 Episode T: 25 Reward: 7.600
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Total T: 17977 Episode Num: 428 Episode T: 66 Reward: -6.600
recent Evaluation: 3.889999999999985
Total T: 18001 Episode Num: 429 Episode T: 24 Reward: 7.700
Total T: 18016 Episode Num: 430 Episode T: 15 Reward: 8.600
Total T: 18082 Episode Num: 431 Episode T: 66 Reward: -6.600
Total T: 18084 Episode Num: 432 Episode T: 2 Reward: 9.900
Total T: 18150 Episode Num: 433 Episode T: 66 Reward: -6.600
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Total T: 18238 Episode Num: 436 Episode T: 66 Reward: -6.600
Total T: 18247 Episode Num: 437 Episode T: 9 Reward: 9.200
Total T: 18313 Episode Num: 438 Episode T: 66 Reward: -6.600
Total T: 18379 Episode Num: 439 Episode T: 66 Reward: -6.600
Total T: 18391 Episode Num: 440 Episode T: 12 Reward: 8.900
Total T: 18406 Episode Num: 441 Episode T: 15 Reward: 8.600
Total T: 18443 Episode Num: 442 Episode T: 37 Reward: 6.400
Total T: 18509 Episode Num: 443 Episode T: 66 Reward: -6.600
Total T: 18575 Episode Num: 444 Episode T: 66 Reward: -6.600
Total T: 18641 Episode Num: 445 Episode T: 66 Reward: -6.600
Total T: 18689 Episode Num: 446 Episode T: 48 Reward: 5.300
Total T: 18755 Episode Num: 447 Episode T: 66 Reward: -6.600
Total T: 18821 Episode Num: 448 Episode T: 66 Reward: -6.600
Total T: 18857 Episode Num: 449 Episode T: 36 Reward: 6.500
Total T: 18923 Episode Num: 450 Episode T: 66 Reward: -6.600
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recent Evaluation: 5.569999999999982
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Total T: 19069 Episode Num: 455 Episode T: 66 Reward: -6.600
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Total T: 19232 Episode Num: 460 Episode T: 9 Reward: 9.200
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Total T: 19315 Episode Num: 462 Episode T: 66 Reward: -6.600
Total T: 19331 Episode Num: 463 Episode T: 16 Reward: 8.500
Total T: 19334 Episode Num: 464 Episode T: 3 Reward: 9.800
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Total T: 19382 Episode Num: 466 Episode T: 34 Reward: 6.700
Total T: 19390 Episode Num: 467 Episode T: 8 Reward: 9.300
Total T: 19456 Episode Num: 468 Episode T: 66 Reward: -6.600
Total T: 19522 Episode Num: 469 Episode T: 66 Reward: -6.600
Total T: 19525 Episode Num: 470 Episode T: 3 Reward: 9.800
Total T: 19591 Episode Num: 471 Episode T: 66 Reward: -6.600
Total T: 19657 Episode Num: 472 Episode T: 66 Reward: -6.600
Total T: 19664 Episode Num: 473 Episode T: 7 Reward: 9.400
Total T: 19730 Episode Num: 474 Episode T: 66 Reward: -6.600
Total T: 19756 Episode Num: 475 Episode T: 26 Reward: 7.500
Total T: 19804 Episode Num: 476 Episode T: 48 Reward: 5.300
Total T: 19870 Episode Num: 477 Episode T: 66 Reward: -6.600
Total T: 19875 Episode Num: 478 Episode T: 5 Reward: 9.600
Total T: 19926 Episode Num: 479 Episode T: 51 Reward: 5.000
Total T: 19992 Episode Num: 480 Episode T: 66 Reward: -6.600
recent Evaluation: -1.8900000000000046

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Total T: 20008 Episode Num: 481 Episode T: 16 Reward: 8.500  
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 Total T: 20140 Episode Num: 483 Episode T: 66 Reward: -6.600  
 Total T: 20146 Episode Num: 484 Episode T: 6 Reward: 9.500  
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 Total T: 20212 Episode Num: 487 Episode T: 13 Reward: 8.800  
 Total T: 20222 Episode Num: 488 Episode T: 10 Reward: 9.100  
 Total T: 20268 Episode Num: 489 Episode T: 46 Reward: 5.500  
 Total T: 20334 Episode Num: 490 Episode T: 66 Reward: -6.600  
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 Total T: 20836 Episode Num: 499 Episode T: 37 Reward: 6.400  
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 Total T: 21318 Episode Num: 509 Episode T: 29 Reward: 7.200  
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 Total T: 21984 Episode Num: 526 Episode T: 66 Reward: -6.600  
 recent Evaluation: 5.089999999999963  
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 Total T: 22067 Episode Num: 528 Episode T: 17 Reward: 8.400  
 Total T: 22133 Episode Num: 529 Episode T: 66 Reward: -6.600  
 Total T: 22147 Episode Num: 530 Episode T: 14 Reward: 8.700  
 Total T: 22213 Episode Num: 531 Episode T: 66 Reward: -6.600  
 Total T: 22279 Episode Num: 532 Episode T: 66 Reward: -6.600  
 Total T: 22319 Episode Num: 533 Episode T: 40 Reward: 6.100  
 Total T: 22385 Episode Num: 534 Episode T: 66 Reward: -6.600  
 Total T: 22451 Episode Num: 535 Episode T: 66 Reward: -6.600  
 Total T: 22517 Episode Num: 536 Episode T: 66 Reward: -6.600  
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 Total T: 22562 Episode Num: 538 Episode T: 9 Reward: 9.200  
 Total T: 22579 Episode Num: 539 Episode T: 17 Reward: 8.400  
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 Total T: 22962 Episode Num: 545 Episode T: 66 Reward: -6.600  
 recent Evaluation: -3.550000000000052  
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 Total T: 23485 Episode Num: 556 Episode T: 66 Reward: -6.600  
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 recent Evaluation: 2.2  
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 Total T: 24356 Episode Num: 577 Episode T: 16 Reward: 8.500  
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 Total T: 24554 Episode Num: 580 Episode T: 66 Reward: -6.600  
 Total T: 24620 Episode Num: 581 Episode T: 66 Reward: -6.600  
 Total T: 24629 Episode Num: 582 Episode T: 9 Reward: 9.200  
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 Total T: 24645 Episode Num: 584 Episode T: 13 Reward: 8.800  
 Total T: 24653 Episode Num: 585 Episode T: 8 Reward: 9.300  
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 Total T: 24907 Episode Num: 591 Episode T: 66 Reward: -6.600  
 Total T: 24973 Episode Num: 592 Episode T: 66 Reward: -6.600

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recent Evaluation: 2.019999999999956
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Total T: 25115 Episode Num: 595 Episode T: 66 Reward: -6.600
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Total T: 25216 Episode Num: 599 Episode T: 13 Reward: 8.800
Total T: 25282 Episode Num: 600 Episode T: 66 Reward: -6.600
Total T: 25319 Episode Num: 601 Episode T: 37 Reward: 6.400
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Total T: 25451 Episode Num: 603 Episode T: 66 Reward: -6.600
Total T: 25517 Episode Num: 604 Episode T: 66 Reward: -6.600
Total T: 25530 Episode Num: 605 Episode T: 13 Reward: 8.800
Total T: 25535 Episode Num: 606 Episode T: 5 Reward: 9.600
Total T: 25553 Episode Num: 607 Episode T: 18 Reward: 8.300
Total T: 25569 Episode Num: 608 Episode T: 16 Reward: 8.500
Total T: 25635 Episode Num: 609 Episode T: 66 Reward: -6.600
Total T: 25701 Episode Num: 610 Episode T: 66 Reward: -6.600
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Total T: 25772 Episode Num: 613 Episode T: 43 Reward: 5.800
Total T: 25838 Episode Num: 614 Episode T: 66 Reward: -6.600
Total T: 25904 Episode Num: 615 Episode T: 66 Reward: -6.600
Total T: 25930 Episode Num: 616 Episode T: 26 Reward: 7.500
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recent Evaluation: 3.729999999999978
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Total T: 26175 Episode Num: 623 Episode T: 66 Reward: -6.600
Total T: 26241 Episode Num: 624 Episode T: 66 Reward: -6.600
Total T: 26253 Episode Num: 625 Episode T: 12 Reward: 8.900
Total T: 26319 Episode Num: 626 Episode T: 66 Reward: -6.600
Total T: 26377 Episode Num: 627 Episode T: 58 Reward: 4.300
Total T: 26443 Episode Num: 628 Episode T: 66 Reward: -6.600
Total T: 26456 Episode Num: 629 Episode T: 13 Reward: 8.800
Total T: 26522 Episode Num: 630 Episode T: 66 Reward: -6.600
Total T: 26539 Episode Num: 631 Episode T: 17 Reward: 8.400
Total T: 26553 Episode Num: 632 Episode T: 14 Reward: 8.700
Total T: 26619 Episode Num: 633 Episode T: 66 Reward: -6.600
Total T: 26685 Episode Num: 634 Episode T: 66 Reward: -6.600
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Total T: 26792 Episode Num: 637 Episode T: 66 Reward: -6.600
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Total T: 26987 Episode Num: 646 Episode T: 23 Reward: 7.800
Total T: 26995 Episode Num: 647 Episode T: 8 Reward: 9.300
recent Evaluation: 0.8500000000000065
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Total T: 27086 Episode Num: 649 Episode T: 66 Reward: -6.600
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Total T: 28758 Episode Num: 688 Episode T: 66 Reward: -6.600
Total T: 28804 Episode Num: 689 Episode T: 46 Reward: 5.500
Total T: 28870 Episode Num: 690 Episode T: 66 Reward: -6.600
Total T: 28910 Episode Num: 691 Episode T: 40 Reward: 6.100
Total T: 28976 Episode Num: 692 Episode T: 66 Reward: -6.600
Total T: 28992 Episode Num: 693 Episode T: 16 Reward: 8.500
recent Evaluation: 0.8799999999999786
Total T: 29058 Episode Num: 694 Episode T: 66 Reward: -6.600
Total T: 29124 Episode Num: 695 Episode T: 66 Reward: -6.600
Total T: 29190 Episode Num: 696 Episode T: 66 Reward: -6.600
Total T: 29256 Episode Num: 697 Episode T: 66 Reward: -6.600
Total T: 29322 Episode Num: 698 Episode T: 66 Reward: -6.600
Total T: 29337 Episode Num: 699 Episode T: 15 Reward: 8.600
Total T: 29371 Episode Num: 700 Episode T: 34 Reward: 6.700
Total T: 29437 Episode Num: 701 Episode T: 66 Reward: -6.600
Total T: 29467 Episode Num: 702 Episode T: 30 Reward: 7.100
Total T: 29477 Episode Num: 703 Episode T: 10 Reward: 9.100

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Total T: 29493 Episode Num: 704 Episode T: 16 Reward: 8.500  
Total T: 29509 Episode Num: 705 Episode T: 16 Reward: 8.500  
Total T: 29575 Episode Num: 706 Episode T: 66 Reward: -6.600  
Total T: 29584 Episode Num: 707 Episode T: 9 Reward: 9.200  
Total T: 29599 Episode Num: 708 Episode T: 15 Reward: 8.600  
Total T: 29607 Episode Num: 709 Episode T: 8 Reward: 9.300  
Total T: 29673 Episode Num: 710 Episode T: 66 Reward: -6.600  
Total T: 29684 Episode Num: 711 Episode T: 11 Reward: 9.000  
Total T: 29700 Episode Num: 712 Episode T: 16 Reward: 8.500  
Total T: 29705 Episode Num: 713 Episode T: 5 Reward: 9.600  
Total T: 29771 Episode Num: 714 Episode T: 66 Reward: -6.600  
Total T: 29837 Episode Num: 715 Episode T: 66 Reward: -6.600  
Total T: 29867 Episode Num: 716 Episode T: 30 Reward: 7.100  
Total T: 29884 Episode Num: 717 Episode T: 17 Reward: 8.400  
Total T: 29950 Episode Num: 718 Episode T: 66 Reward: -6.600  
recent Evaluation: 1.1600000000000084  
Total T: 30016 Episode Num: 719 Episode T: 66 Reward: -6.600  
Total T: 30055 Episode Num: 720 Episode T: 39 Reward: 6.200  
Total T: 30066 Episode Num: 721 Episode T: 11 Reward: 9.000  
Total T: 30132 Episode Num: 722 Episode T: 66 Reward: -6.600  
Total T: 30198 Episode Num: 723 Episode T: 66 Reward: -6.600  
Total T: 30264 Episode Num: 724 Episode T: 66 Reward: -6.600  
Total T: 30330 Episode Num: 725 Episode T: 66 Reward: -6.600  
Total T: 30346 Episode Num: 726 Episode T: 16 Reward: 8.500  
Total T: 30412 Episode Num: 727 Episode T: 66 Reward: -6.600  
Total T: 30478 Episode Num: 728 Episode T: 66 Reward: -6.600  
Total T: 30482 Episode Num: 729 Episode T: 4 Reward: 9.700  
Total T: 30548 Episode Num: 730 Episode T: 66 Reward: -6.600  
Total T: 30614 Episode Num: 731 Episode T: 66 Reward: -6.600  
Total T: 30680 Episode Num: 732 Episode T: 66 Reward: -6.600  
Total T: 30746 Episode Num: 733 Episode T: 66 Reward: -6.600  
Total T: 30789 Episode Num: 734 Episode T: 43 Reward: 5.800  
Total T: 30855 Episode Num: 735 Episode T: 66 Reward: -6.600  
Total T: 30921 Episode Num: 736 Episode T: 66 Reward: -6.600  
Total T: 30970 Episode Num: 737 Episode T: 49 Reward: 5.200  
recent Evaluation: 2.739999999999983  
Total T: 31004 Episode Num: 738 Episode T: 34 Reward: 6.700  
Total T: 31070 Episode Num: 739 Episode T: 66 Reward: -6.600  
Total T: 31136 Episode Num: 740 Episode T: 66 Reward: -6.600  
Total T: 31202 Episode Num: 741 Episode T: 66 Reward: -6.600  
Total T: 31268 Episode Num: 742 Episode T: 66 Reward: -6.600  
Total T: 31334 Episode Num: 743 Episode T: 66 Reward: -6.600  
Total T: 31338 Episode Num: 744 Episode T: 4 Reward: 9.700  
Total T: 31343 Episode Num: 745 Episode T: 5 Reward: 9.600  
Total T: 31409 Episode Num: 746 Episode T: 66 Reward: -6.600  
Total T: 31475 Episode Num: 747 Episode T: 66 Reward: -6.600  
Total T: 31541 Episode Num: 748 Episode T: 66 Reward: -6.600  
Total T: 31607 Episode Num: 749 Episode T: 66 Reward: -6.600  
Total T: 31628 Episode Num: 750 Episode T: 21 Reward: 8.000  
Total T: 31636 Episode Num: 751 Episode T: 8 Reward: 9.300  
Total T: 31652 Episode Num: 752 Episode T: 16 Reward: 8.500  
Total T: 31718 Episode Num: 753 Episode T: 66 Reward: -6.600  
Total T: 31722 Episode Num: 754 Episode T: 4 Reward: 9.700  
Total T: 31736 Episode Num: 755 Episode T: 14 Reward: 8.700  
Total T: 31802 Episode Num: 756 Episode T: 66 Reward: -6.600  
Total T: 31818 Episode Num: 757 Episode T: 16 Reward: 8.500  
Total T: 31835 Episode Num: 758 Episode T: 17 Reward: 8.400  
Total T: 31841 Episode Num: 759 Episode T: 6 Reward: 9.500  
Total T: 31869 Episode Num: 760 Episode T: 28 Reward: 7.300  
Total T: 31935 Episode Num: 761 Episode T: 66 Reward: -6.600  
Total T: 31988 Episode Num: 762 Episode T: 53 Reward: 4.800  
recent Evaluation: -0.3199999999999898  
Total T: 32005 Episode Num: 763 Episode T: 17 Reward: 8.400  
Total T: 32071 Episode Num: 764 Episode T: 66 Reward: -6.600  
Total T: 32137 Episode Num: 765 Episode T: 66 Reward: -6.600  
Total T: 32203 Episode Num: 766 Episode T: 66 Reward: -6.600  
Total T: 32269 Episode Num: 767 Episode T: 66 Reward: -6.600  
Total T: 32289 Episode Num: 768 Episode T: 20 Reward: 8.100  
Total T: 32355 Episode Num: 769 Episode T: 66 Reward: -6.600  
Total T: 32421 Episode Num: 770 Episode T: 66 Reward: -6.600  
Total T: 32431 Episode Num: 771 Episode T: 10 Reward: 9.100  
Total T: 32447 Episode Num: 772 Episode T: 16 Reward: 8.500  
Total T: 32455 Episode Num: 773 Episode T: 8 Reward: 9.300  
Total T: 32461 Episode Num: 774 Episode T: 6 Reward: 9.500  
Total T: 32519 Episode Num: 775 Episode T: 58 Reward: 4.300  
Total T: 32536 Episode Num: 776 Episode T: 17 Reward: 8.400  
Total T: 32602 Episode Num: 777 Episode T: 66 Reward: -6.600  
Total T: 32644 Episode Num: 778 Episode T: 42 Reward: 5.900  
Total T: 32710 Episode Num: 779 Episode T: 66 Reward: -6.600  
Total T: 32776 Episode Num: 780 Episode T: 66 Reward: -6.600  
Total T: 32842 Episode Num: 781 Episode T: 66 Reward: -6.600  
Total T: 32883 Episode Num: 782 Episode T: 41 Reward: 6.000  
Total T: 32949 Episode Num: 783 Episode T: 66 Reward: -6.600  
recent Evaluation: 1.3500000000000096  
Total T: 33015 Episode Num: 784 Episode T: 66 Reward: -6.600  
Total T: 33029 Episode Num: 785 Episode T: 14 Reward: 8.700  
Total T: 33095 Episode Num: 786 Episode T: 66 Reward: -6.600  
Total T: 33110 Episode Num: 787 Episode T: 15 Reward: 8.600  
Total T: 33123 Episode Num: 788 Episode T: 13 Reward: 8.800  
Total T: 33125 Episode Num: 789 Episode T: 2 Reward: 9.900  
Total T: 33191 Episode Num: 790 Episode T: 66 Reward: -6.600  
Total T: 33257 Episode Num: 791 Episode T: 66 Reward: -6.600  
Total T: 33323 Episode Num: 792 Episode T: 66 Reward: -6.600  
Total T: 33389 Episode Num: 793 Episode T: 66 Reward: -6.600  
Total T: 33396 Episode Num: 794 Episode T: 7 Reward: 9.400  
Total T: 33462 Episode Num: 795 Episode T: 66 Reward: -6.600  
Total T: 33468 Episode Num: 796 Episode T: 6 Reward: 9.500  
Total T: 33481 Episode Num: 797 Episode T: 13 Reward: 8.800  
Total T: 33495 Episode Num: 798 Episode T: 14 Reward: 8.700  
Total T: 33561 Episode Num: 799 Episode T: 66 Reward: -6.600  
Total T: 33627 Episode Num: 800 Episode T: 66 Reward: -6.600  
Total T: 33693 Episode Num: 801 Episode T: 66 Reward: -6.600  
Total T: 33759 Episode Num: 802 Episode T: 66 Reward: -6.600  
Total T: 33825 Episode Num: 803 Episode T: 66 Reward: -6.600  
Total T: 33843 Episode Num: 804 Episode T: 18 Reward: 8.300  
Total T: 33855 Episode Num: 805 Episode T: 12 Reward: 8.900  
Total T: 33921 Episode Num: 806 Episode T: 66 Reward: -6.600  
Total T: 33931 Episode Num: 807 Episode T: 10 Reward: 9.100  
Total T: 33997 Episode Num: 808 Episode T: 66 Reward: -6.600  
recent Evaluation: -1.979999999999998  
Total T: 34008 Episode Num: 809 Episode T: 11 Reward: 9.000  
Total T: 34074 Episode Num: 810 Episode T: 66 Reward: -6.600  
Total T: 34140 Episode Num: 811 Episode T: 66 Reward: -6.600  
Total T: 34206 Episode Num: 812 Episode T: 66 Reward: -6.600  
Total T: 34210 Episode Num: 813 Episode T: 4 Reward: 9.700  
Total T: 34226 Episode Num: 814 Episode T: 16 Reward: 8.500

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Total T: 34292 Episode Num: 815 Episode T: 66 Reward: -6.600
Total T: 34358 Episode Num: 816 Episode T: 66 Reward: -6.600
Total T: 34375 Episode Num: 817 Episode T: 17 Reward: 8.400
Total T: 34441 Episode Num: 818 Episode T: 66 Reward: -6.600
Total T: 34507 Episode Num: 819 Episode T: 66 Reward: -6.600
Total T: 34573 Episode Num: 820 Episode T: 66 Reward: -6.600
Total T: 34639 Episode Num: 821 Episode T: 66 Reward: -6.600
Total T: 34705 Episode Num: 822 Episode T: 66 Reward: -6.600
Total T: 34771 Episode Num: 823 Episode T: 66 Reward: -6.600
Total T: 34837 Episode Num: 824 Episode T: 66 Reward: -6.600
Total T: 34852 Episode Num: 825 Episode T: 15 Reward: 8.600
Total T: 34918 Episode Num: 826 Episode T: 66 Reward: -6.600
Total T: 34984 Episode Num: 827 Episode T: 66 Reward: -6.600
Total T: 34992 Episode Num: 828 Episode T: 8 Reward: 9.300
recent Evaluation: -0.309999999999888
Total T: 35039 Episode Num: 829 Episode T: 47 Reward: 5.400
Total T: 35105 Episode Num: 830 Episode T: 66 Reward: -6.600
Total T: 35171 Episode Num: 831 Episode T: 66 Reward: -6.600
Total T: 35237 Episode Num: 832 Episode T: 66 Reward: -6.600
Total T: 35303 Episode Num: 833 Episode T: 66 Reward: -6.600
Total T: 35315 Episode Num: 834 Episode T: 12 Reward: 8.900
Total T: 35336 Episode Num: 835 Episode T: 21 Reward: 8.000
Total T: 35402 Episode Num: 836 Episode T: 66 Reward: -6.600
Total T: 35468 Episode Num: 837 Episode T: 66 Reward: -6.600
Total T: 35534 Episode Num: 838 Episode T: 66 Reward: -6.600
Total T: 35542 Episode Num: 839 Episode T: 8 Reward: 9.300
Total T: 35547 Episode Num: 840 Episode T: 5 Reward: 9.600
Total T: 35613 Episode Num: 841 Episode T: 66 Reward: -6.600
Total T: 35679 Episode Num: 842 Episode T: 66 Reward: -6.600
Total T: 35745 Episode Num: 843 Episode T: 66 Reward: -6.600
Total T: 35811 Episode Num: 844 Episode T: 66 Reward: -6.600
Total T: 35877 Episode Num: 845 Episode T: 66 Reward: -6.600
Total T: 35943 Episode Num: 846 Episode T: 66 Reward: -6.600
recent Evaluation: -5.010000000000058
Total T: 36009 Episode Num: 847 Episode T: 66 Reward: -6.600
Total T: 36075 Episode Num: 848 Episode T: 66 Reward: -6.600
Total T: 36086 Episode Num: 849 Episode T: 11 Reward: 9.000
Total T: 36152 Episode Num: 850 Episode T: 66 Reward: -6.600
Total T: 36218 Episode Num: 851 Episode T: 66 Reward: -6.600
Total T: 36231 Episode Num: 852 Episode T: 13 Reward: 8.800
Total T: 36297 Episode Num: 853 Episode T: 66 Reward: -6.600
Total T: 36363 Episode Num: 854 Episode T: 66 Reward: -6.600
Total T: 36370 Episode Num: 855 Episode T: 7 Reward: 9.400
Total T: 36379 Episode Num: 856 Episode T: 9 Reward: 9.200
Total T: 36393 Episode Num: 857 Episode T: 14 Reward: 8.700
Total T: 36459 Episode Num: 858 Episode T: 66 Reward: -6.600
Total T: 36525 Episode Num: 859 Episode T: 66 Reward: -6.600
Total T: 36591 Episode Num: 860 Episode T: 66 Reward: -6.600
Total T: 36657 Episode Num: 861 Episode T: 66 Reward: -6.600
Total T: 36723 Episode Num: 862 Episode T: 66 Reward: -6.600
Total T: 36789 Episode Num: 863 Episode T: 66 Reward: -6.600
Total T: 36807 Episode Num: 864 Episode T: 18 Reward: 8.300
Total T: 36821 Episode Num: 865 Episode T: 14 Reward: 8.700
Total T: 36887 Episode Num: 866 Episode T: 66 Reward: -6.600
Total T: 36904 Episode Num: 867 Episode T: 17 Reward: 8.400
Total T: 36920 Episode Num: 868 Episode T: 16 Reward: 8.500
Total T: 36986 Episode Num: 869 Episode T: 66 Reward: -6.600
recent Evaluation: 2.41999999999977
Total T: 37011 Episode Num: 870 Episode T: 25 Reward: 7.600
Total T: 37048 Episode Num: 871 Episode T: 37 Reward: 6.400
Total T: 37057 Episode Num: 872 Episode T: 9 Reward: 9.200
Total T: 37075 Episode Num: 873 Episode T: 18 Reward: 8.300
Total T: 37121 Episode Num: 874 Episode T: 46 Reward: 5.500
Total T: 37130 Episode Num: 875 Episode T: 9 Reward: 9.200
Total T: 37147 Episode Num: 876 Episode T: 17 Reward: 8.400
Total T: 37213 Episode Num: 877 Episode T: 66 Reward: -6.600
Total T: 37279 Episode Num: 878 Episode T: 66 Reward: -6.600
Total T: 37345 Episode Num: 879 Episode T: 66 Reward: -6.600
Total T: 37375 Episode Num: 880 Episode T: 30 Reward: 7.100
Total T: 37398 Episode Num: 881 Episode T: 23 Reward: 7.800
Total T: 37415 Episode Num: 882 Episode T: 17 Reward: 8.400
Total T: 37426 Episode Num: 883 Episode T: 11 Reward: 9.000
Total T: 37473 Episode Num: 884 Episode T: 47 Reward: 5.400
Total T: 37539 Episode Num: 885 Episode T: 66 Reward: -6.600
Total T: 37548 Episode Num: 886 Episode T: 9 Reward: 9.200
Total T: 37558 Episode Num: 887 Episode T: 10 Reward: 9.100
Total T: 37593 Episode Num: 888 Episode T: 35 Reward: 6.600
Total T: 37610 Episode Num: 889 Episode T: 17 Reward: 8.400
Total T: 37619 Episode Num: 890 Episode T: 9 Reward: 9.200
Total T: 37685 Episode Num: 891 Episode T: 66 Reward: -6.600
Total T: 37704 Episode Num: 892 Episode T: 19 Reward: 8.200
Total T: 37714 Episode Num: 893 Episode T: 10 Reward: 9.100
Total T: 37780 Episode Num: 894 Episode T: 66 Reward: -6.600
Total T: 37791 Episode Num: 895 Episode T: 11 Reward: 9.000
Total T: 37857 Episode Num: 896 Episode T: 66 Reward: -6.600
Total T: 37863 Episode Num: 897 Episode T: 6 Reward: 9.500
Total T: 37870 Episode Num: 898 Episode T: 7 Reward: 9.400
Total T: 37892 Episode Num: 899 Episode T: 22 Reward: 7.900
Total T: 37958 Episode Num: 900 Episode T: 66 Reward: -6.600
Total T: 37968 Episode Num: 901 Episode T: 10 Reward: 9.100
recent Evaluation: 7.309999999999983
Total T: 38002 Episode Num: 902 Episode T: 34 Reward: 6.700
Total T: 38009 Episode Num: 903 Episode T: 7 Reward: 9.400
Total T: 38026 Episode Num: 904 Episode T: 17 Reward: 8.400
Total T: 38073 Episode Num: 905 Episode T: 47 Reward: 5.400
Total T: 38139 Episode Num: 906 Episode T: 66 Reward: -6.600
Total T: 38170 Episode Num: 907 Episode T: 31 Reward: 7.000
Total T: 38183 Episode Num: 908 Episode T: 13 Reward: 8.800
Total T: 38249 Episode Num: 909 Episode T: 66 Reward: -6.600
Total T: 38315 Episode Num: 910 Episode T: 66 Reward: -6.600
Total T: 38359 Episode Num: 911 Episode T: 44 Reward: 5.700
Total T: 38425 Episode Num: 912 Episode T: 66 Reward: -6.600
Total T: 38438 Episode Num: 913 Episode T: 13 Reward: 8.800
Total T: 38504 Episode Num: 914 Episode T: 66 Reward: -6.600
Total T: 38534 Episode Num: 915 Episode T: 30 Reward: 7.100
Total T: 38600 Episode Num: 916 Episode T: 66 Reward: -6.600
Total T: 38666 Episode Num: 917 Episode T: 66 Reward: -6.600
Total T: 38732 Episode Num: 918 Episode T: 66 Reward: -6.600
Total T: 38798 Episode Num: 919 Episode T: 66 Reward: -6.600
Total T: 38844 Episode Num: 920 Episode T: 46 Reward: 5.500
Total T: 38857 Episode Num: 921 Episode T: 13 Reward: 8.800
Total T: 38860 Episode Num: 922 Episode T: 3 Reward: 9.800
Total T: 38870 Episode Num: 923 Episode T: 10 Reward: 9.100
Total T: 38936 Episode Num: 924 Episode T: 66 Reward: -6.600
Total T: 38939 Episode Num: 925 Episode T: 3 Reward: 9.800
recent Evaluation: -2.390000000000077

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Total T: 39005 Episode Num: 926 Episode T: 66 Reward: -6.600
Total T: 39031 Episode Num: 927 Episode T: 26 Reward: 7.500
Total T: 39048 Episode Num: 928 Episode T: 17 Reward: 8.400
Total T: 39114 Episode Num: 929 Episode T: 66 Reward: -6.600
Total T: 39180 Episode Num: 930 Episode T: 66 Reward: -6.600
Total T: 39193 Episode Num: 931 Episode T: 13 Reward: 8.800
Total T: 39259 Episode Num: 932 Episode T: 66 Reward: -6.600
Total T: 39270 Episode Num: 933 Episode T: 11 Reward: 9.000
Total T: 39281 Episode Num: 934 Episode T: 11 Reward: 9.000
Total T: 39285 Episode Num: 935 Episode T: 4 Reward: 9.700
Total T: 39351 Episode Num: 936 Episode T: 66 Reward: -6.600
Total T: 39364 Episode Num: 937 Episode T: 13 Reward: 8.800
Total T: 39430 Episode Num: 938 Episode T: 66 Reward: -6.600
Total T: 39436 Episode Num: 939 Episode T: 6 Reward: 9.500
Total T: 39439 Episode Num: 940 Episode T: 3 Reward: 9.800
Total T: 39458 Episode Num: 941 Episode T: 19 Reward: 8.200
Total T: 39524 Episode Num: 942 Episode T: 66 Reward: -6.600
Total T: 39544 Episode Num: 943 Episode T: 20 Reward: 8.100
Total T: 39552 Episode Num: 944 Episode T: 8 Reward: 9.300
Total T: 39618 Episode Num: 945 Episode T: 66 Reward: -6.600
Total T: 39635 Episode Num: 946 Episode T: 17 Reward: 8.400
Total T: 39645 Episode Num: 947 Episode T: 10 Reward: 9.100
Total T: 39711 Episode Num: 948 Episode T: 66 Reward: -6.600
Total T: 39777 Episode Num: 949 Episode T: 66 Reward: -6.600
Total T: 39783 Episode Num: 950 Episode T: 6 Reward: 9.500
Total T: 39849 Episode Num: 951 Episode T: 66 Reward: -6.600
Total T: 39915 Episode Num: 952 Episode T: 66 Reward: -6.600
Total T: 39933 Episode Num: 953 Episode T: 18 Reward: 8.300
Total T: 39999 Episode Num: 954 Episode T: 66 Reward: -6.600
recent Evaluation: -1.8200000000000416
Total T: 40065 Episode Num: 955 Episode T: 66 Reward: -6.600
Total T: 40131 Episode Num: 956 Episode T: 66 Reward: -6.600
Total T: 40144 Episode Num: 957 Episode T: 13 Reward: 8.800
Total T: 40210 Episode Num: 958 Episode T: 66 Reward: -6.600
Total T: 40276 Episode Num: 959 Episode T: 66 Reward: -6.600
Total T: 40313 Episode Num: 960 Episode T: 37 Reward: 6.400
Total T: 40323 Episode Num: 961 Episode T: 10 Reward: 9.100
Total T: 40340 Episode Num: 962 Episode T: 17 Reward: 8.400
Total T: 40352 Episode Num: 963 Episode T: 12 Reward: 8.900
Total T: 40361 Episode Num: 964 Episode T: 9 Reward: 9.200
Total T: 40427 Episode Num: 965 Episode T: 66 Reward: -6.600
Total T: 40487 Episode Num: 966 Episode T: 60 Reward: 4.100
Total T: 40553 Episode Num: 967 Episode T: 66 Reward: -6.600
Total T: 40600 Episode Num: 968 Episode T: 47 Reward: 5.400
Total T: 40618 Episode Num: 969 Episode T: 18 Reward: 8.300
Total T: 40638 Episode Num: 970 Episode T: 20 Reward: 8.100
Total T: 40643 Episode Num: 971 Episode T: 5 Reward: 9.600
Total T: 40709 Episode Num: 972 Episode T: 66 Reward: -6.600
Total T: 40775 Episode Num: 973 Episode T: 66 Reward: -6.600
Total T: 40786 Episode Num: 974 Episode T: 11 Reward: 9.000
Total T: 40799 Episode Num: 975 Episode T: 13 Reward: 8.800
Total T: 40814 Episode Num: 976 Episode T: 15 Reward: 8.600
Total T: 40833 Episode Num: 977 Episode T: 19 Reward: 8.200
Total T: 40899 Episode Num: 978 Episode T: 66 Reward: -6.600
Total T: 40907 Episode Num: 979 Episode T: 8 Reward: 9.300
Total T: 40973 Episode Num: 980 Episode T: 66 Reward: -6.600
recent Evaluation: -1.9099999999999997
Total T: 41039 Episode Num: 981 Episode T: 66 Reward: -6.600
Total T: 41046 Episode Num: 982 Episode T: 7 Reward: 9.400
Total T: 41112 Episode Num: 983 Episode T: 66 Reward: -6.600
Total T: 41118 Episode Num: 984 Episode T: 6 Reward: 9.500
Total T: 41184 Episode Num: 985 Episode T: 66 Reward: -6.600
Total T: 41250 Episode Num: 986 Episode T: 66 Reward: -6.600
Total T: 41316 Episode Num: 987 Episode T: 66 Reward: -6.600
Total T: 41382 Episode Num: 988 Episode T: 66 Reward: -6.600
Total T: 41396 Episode Num: 989 Episode T: 14 Reward: 8.700
Total T: 41462 Episode Num: 990 Episode T: 66 Reward: -6.600
Total T: 41465 Episode Num: 991 Episode T: 3 Reward: 9.800
Total T: 41531 Episode Num: 992 Episode T: 66 Reward: -6.600
Total T: 41597 Episode Num: 993 Episode T: 66 Reward: -6.600
Total T: 41623 Episode Num: 994 Episode T: 26 Reward: 7.500
Total T: 41689 Episode Num: 995 Episode T: 66 Reward: -6.600
Total T: 41700 Episode Num: 996 Episode T: 11 Reward: 9.000
Total T: 41766 Episode Num: 997 Episode T: 66 Reward: -6.600
Total T: 41832 Episode Num: 998 Episode T: 66 Reward: -6.600
Total T: 41898 Episode Num: 999 Episode T: 66 Reward: -6.600
Total T: 41964 Episode Num: 1000 Episode T: 66 Reward: -6.600
recent Evaluation: 1.1699999999999968
Total T: 42030 Episode Num: 1001 Episode T: 66 Reward: -6.600
Total T: 42041 Episode Num: 1002 Episode T: 11 Reward: 9.000
Total T: 42057 Episode Num: 1003 Episode T: 16 Reward: 8.500
Total T: 42123 Episode Num: 1004 Episode T: 66 Reward: -6.600
Total T: 42189 Episode Num: 1005 Episode T: 66 Reward: -6.600
Total T: 42201 Episode Num: 1006 Episode T: 12 Reward: 8.900
Total T: 42267 Episode Num: 1007 Episode T: 66 Reward: -6.600
Total T: 42333 Episode Num: 1008 Episode T: 66 Reward: -6.600
Total T: 42341 Episode Num: 1009 Episode T: 8 Reward: 9.300
Total T: 42348 Episode Num: 1010 Episode T: 7 Reward: 9.400
Total T: 42414 Episode Num: 1011 Episode T: 66 Reward: -6.600
Total T: 42480 Episode Num: 1012 Episode T: 66 Reward: -6.600
Total T: 42491 Episode Num: 1013 Episode T: 11 Reward: 9.000
Total T: 42497 Episode Num: 1014 Episode T: 6 Reward: 9.500
Total T: 42502 Episode Num: 1015 Episode T: 5 Reward: 9.600
Total T: 42510 Episode Num: 1016 Episode T: 8 Reward: 9.300
Total T: 42527 Episode Num: 1017 Episode T: 17 Reward: 8.400
Total T: 42593 Episode Num: 1018 Episode T: 66 Reward: -6.600
Total T: 42619 Episode Num: 1019 Episode T: 26 Reward: 7.500
Total T: 42685 Episode Num: 1020 Episode T: 66 Reward: -6.600
Total T: 42751 Episode Num: 1021 Episode T: 66 Reward: -6.600
Total T: 42817 Episode Num: 1022 Episode T: 66 Reward: -6.600
Total T: 42883 Episode Num: 1023 Episode T: 66 Reward: -6.600
Total T: 42889 Episode Num: 1024 Episode T: 6 Reward: 9.500
Total T: 42955 Episode Num: 1025 Episode T: 66 Reward: -6.600
recent Evaluation: -0.39000000000000307
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Total T: 43025 Episode Num: 1027 Episode T: 4 Reward: 9.700
Total T: 43091 Episode Num: 1028 Episode T: 66 Reward: -6.600
Total T: 43157 Episode Num: 1029 Episode T: 66 Reward: -6.600
Total T: 43223 Episode Num: 1030 Episode T: 66 Reward: -6.600
Total T: 43289 Episode Num: 1031 Episode T: 66 Reward: -6.600
Total T: 43355 Episode Num: 1032 Episode T: 66 Reward: -6.600
Total T: 43374 Episode Num: 1033 Episode T: 19 Reward: 8.200
Total T: 43440 Episode Num: 1034 Episode T: 66 Reward: -6.600
Total T: 43506 Episode Num: 1035 Episode T: 66 Reward: -6.600
Total T: 43509 Episode Num: 1036 Episode T: 3 Reward: 9.800
Total T: 43575 Episode Num: 1037 Episode T: 66 Reward: -6.600

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Total T: 43588 Episode Num: 1038 Episode T: 13 Reward: 8.800
Total T: 43654 Episode Num: 1039 Episode T: 66 Reward: -6.600
Total T: 43720 Episode Num: 1040 Episode T: 66 Reward: -6.600
Total T: 43786 Episode Num: 1041 Episode T: 66 Reward: -6.600
Total T: 43802 Episode Num: 1042 Episode T: 16 Reward: 8.500
Total T: 43868 Episode Num: 1043 Episode T: 66 Reward: -6.600
Total T: 43934 Episode Num: 1044 Episode T: 66 Reward: -6.600
Total T: 43936 Episode Num: 1045 Episode T: 2 Reward: 9.900
Total T: 43945 Episode Num: 1046 Episode T: 9 Reward: 9.200
Total T: 43954 Episode Num: 1047 Episode T: 9 Reward: 9.200
Total T: 43995 Episode Num: 1048 Episode T: 41 Reward: 6.000
recent Evaluation: 2.6600000000000015
Total T: 44010 Episode Num: 1049 Episode T: 15 Reward: 8.600
Total T: 44076 Episode Num: 1050 Episode T: 66 Reward: -6.600
Total T: 44142 Episode Num: 1051 Episode T: 66 Reward: -6.600
Total T: 44150 Episode Num: 1052 Episode T: 8 Reward: 9.300
Total T: 44163 Episode Num: 1053 Episode T: 13 Reward: 8.800
Total T: 44229 Episode Num: 1054 Episode T: 66 Reward: -6.600
Total T: 44240 Episode Num: 1055 Episode T: 11 Reward: 9.000
Total T: 44257 Episode Num: 1056 Episode T: 17 Reward: 8.400
Total T: 44281 Episode Num: 1057 Episode T: 24 Reward: 7.700
Total T: 44299 Episode Num: 1058 Episode T: 18 Reward: 8.300
Total T: 44365 Episode Num: 1059 Episode T: 66 Reward: -6.600
Total T: 44372 Episode Num: 1060 Episode T: 7 Reward: 9.400
Total T: 44383 Episode Num: 1061 Episode T: 11 Reward: 9.000
Total T: 44449 Episode Num: 1062 Episode T: 66 Reward: -6.600
Total T: 44467 Episode Num: 1063 Episode T: 18 Reward: 8.300
Total T: 44480 Episode Num: 1064 Episode T: 13 Reward: 8.800
Total T: 44490 Episode Num: 1065 Episode T: 10 Reward: 9.100
Total T: 44556 Episode Num: 1066 Episode T: 66 Reward: -6.600
Total T: 44568 Episode Num: 1067 Episode T: 12 Reward: 8.900
Total T: 44575 Episode Num: 1068 Episode T: 7 Reward: 9.400
Total T: 44641 Episode Num: 1069 Episode T: 66 Reward: -6.600
Total T: 44707 Episode Num: 1070 Episode T: 66 Reward: -6.600
Total T: 44773 Episode Num: 1071 Episode T: 66 Reward: -6.600
Total T: 44795 Episode Num: 1072 Episode T: 22 Reward: 7.900
Total T: 44861 Episode Num: 1073 Episode T: 66 Reward: -6.600
Total T: 44880 Episode Num: 1074 Episode T: 19 Reward: 8.200
Total T: 44900 Episode Num: 1075 Episode T: 20 Reward: 8.100
Total T: 44966 Episode Num: 1076 Episode T: 66 Reward: -6.600
Total T: 44984 Episode Num: 1077 Episode T: 18 Reward: 8.300
Total T: 44996 Episode Num: 1078 Episode T: 12 Reward: 8.900
recent Evaluation: 1.3600000000000008
Total T: 45062 Episode Num: 1079 Episode T: 66 Reward: -6.600
Total T: 45066 Episode Num: 1080 Episode T: 4 Reward: 9.700
Total T: 45081 Episode Num: 1081 Episode T: 15 Reward: 8.600
Total T: 45087 Episode Num: 1082 Episode T: 6 Reward: 9.500
Total T: 45153 Episode Num: 1083 Episode T: 66 Reward: -6.600
Total T: 45219 Episode Num: 1084 Episode T: 66 Reward: -6.600
Total T: 45250 Episode Num: 1085 Episode T: 31 Reward: 7.000
Total T: 45316 Episode Num: 1086 Episode T: 66 Reward: -6.600
Total T: 45346 Episode Num: 1087 Episode T: 30 Reward: 7.100
Total T: 45412 Episode Num: 1088 Episode T: 66 Reward: -6.600
Total T: 45419 Episode Num: 1089 Episode T: 7 Reward: 9.400
Total T: 45439 Episode Num: 1090 Episode T: 20 Reward: 8.100
Total T: 45456 Episode Num: 1091 Episode T: 17 Reward: 8.400
Total T: 45522 Episode Num: 1092 Episode T: 66 Reward: -6.600
Total T: 45588 Episode Num: 1093 Episode T: 66 Reward: -6.600
Total T: 45654 Episode Num: 1094 Episode T: 66 Reward: -6.600
Total T: 45667 Episode Num: 1095 Episode T: 13 Reward: 8.800
Total T: 45669 Episode Num: 1096 Episode T: 2 Reward: 9.900
Total T: 45687 Episode Num: 1097 Episode T: 18 Reward: 8.300
Total T: 45753 Episode Num: 1098 Episode T: 66 Reward: -6.600
Total T: 45771 Episode Num: 1099 Episode T: 18 Reward: 8.300
Total T: 45776 Episode Num: 1100 Episode T: 5 Reward: 9.600
Total T: 45779 Episode Num: 1101 Episode T: 3 Reward: 9.800
Total T: 45791 Episode Num: 1102 Episode T: 12 Reward: 8.900
Total T: 45818 Episode Num: 1103 Episode T: 27 Reward: 7.400
Total T: 45845 Episode Num: 1104 Episode T: 27 Reward: 7.400
Total T: 45911 Episode Num: 1105 Episode T: 66 Reward: -6.600
Total T: 45977 Episode Num: 1106 Episode T: 66 Reward: -6.600
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Total T: 46057 Episode Num: 1109 Episode T: 8 Reward: 9.300
Total T: 46123 Episode Num: 1110 Episode T: 66 Reward: -6.600
Total T: 46138 Episode Num: 1111 Episode T: 15 Reward: 8.600
Total T: 46145 Episode Num: 1112 Episode T: 7 Reward: 9.400
Total T: 46146 Episode Num: 1113 Episode T: 1 Reward: 10.000
Total T: 46163 Episode Num: 1114 Episode T: 17 Reward: 8.400
Total T: 46180 Episode Num: 1115 Episode T: 17 Reward: 8.400
Total T: 46183 Episode Num: 1116 Episode T: 3 Reward: 9.800
Total T: 46208 Episode Num: 1117 Episode T: 25 Reward: 7.600
Total T: 46226 Episode Num: 1118 Episode T: 18 Reward: 8.300
Total T: 46292 Episode Num: 1119 Episode T: 66 Reward: -6.600
Total T: 46358 Episode Num: 1120 Episode T: 66 Reward: -6.600
Total T: 46424 Episode Num: 1121 Episode T: 66 Reward: -6.600
Total T: 46490 Episode Num: 1122 Episode T: 66 Reward: -6.600
Total T: 46501 Episode Num: 1123 Episode T: 11 Reward: 9.000
Total T: 46524 Episode Num: 1124 Episode T: 23 Reward: 7.800
Total T: 46590 Episode Num: 1125 Episode T: 66 Reward: -6.600
Total T: 46605 Episode Num: 1126 Episode T: 15 Reward: 8.600
Total T: 46638 Episode Num: 1127 Episode T: 33 Reward: 6.800
Total T: 46648 Episode Num: 1128 Episode T: 10 Reward: 9.100
Total T: 46677 Episode Num: 1129 Episode T: 29 Reward: 7.200
Total T: 46743 Episode Num: 1130 Episode T: 66 Reward: -6.600
Total T: 46773 Episode Num: 1131 Episode T: 30 Reward: 7.100
Total T: 46784 Episode Num: 1132 Episode T: 11 Reward: 9.000
Total T: 46789 Episode Num: 1133 Episode T: 5 Reward: 9.600
Total T: 46827 Episode Num: 1134 Episode T: 38 Reward: 6.300
Total T: 46893 Episode Num: 1135 Episode T: 66 Reward: -6.600
Total T: 46959 Episode Num: 1136 Episode T: 66 Reward: -6.600
Total T: 46967 Episode Num: 1137 Episode T: 8 Reward: 9.300
Total T: 46970 Episode Num: 1138 Episode T: 3 Reward: 9.800
Total T: 46987 Episode Num: 1139 Episode T: 17 Reward: 8.400
recent Evaluation: 3.9599999999999995
Total T: 47053 Episode Num: 1140 Episode T: 66 Reward: -6.600
Total T: 47067 Episode Num: 1141 Episode T: 14 Reward: 8.700
Total T: 47133 Episode Num: 1142 Episode T: 66 Reward: -6.600
Total T: 47199 Episode Num: 1143 Episode T: 66 Reward: -6.600
Total T: 47205 Episode Num: 1144 Episode T: 6 Reward: 9.500
Total T: 47215 Episode Num: 1145 Episode T: 10 Reward: 9.100
Total T: 47281 Episode Num: 1146 Episode T: 66 Reward: -6.600
Total T: 47319 Episode Num: 1147 Episode T: 38 Reward: 6.300
Total T: 47353 Episode Num: 1148 Episode T: 34 Reward: 6.700
Total T: 47419 Episode Num: 1149 Episode T: 66 Reward: -6.600

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Total T: 47436 Episode Num: 1150 Episode T: 17 Reward: 8.400
Total T: 47470 Episode Num: 1151 Episode T: 34 Reward: 6.700
Total T: 47536 Episode Num: 1152 Episode T: 66 Reward: -6.600
Total T: 47602 Episode Num: 1153 Episode T: 66 Reward: -6.600
Total T: 47604 Episode Num: 1154 Episode T: 2 Reward: 9.900
Total T: 47636 Episode Num: 1155 Episode T: 32 Reward: 6.900
Total T: 47702 Episode Num: 1156 Episode T: 66 Reward: -6.600
Total T: 47721 Episode Num: 1157 Episode T: 19 Reward: 8.200
Total T: 47787 Episode Num: 1158 Episode T: 66 Reward: -6.600
Total T: 47842 Episode Num: 1159 Episode T: 55 Reward: 4.600
Total T: 47861 Episode Num: 1160 Episode T: 19 Reward: 8.200
Total T: 47871 Episode Num: 1161 Episode T: 10 Reward: 9.100
Total T: 47937 Episode Num: 1162 Episode T: 66 Reward: -6.600
Total T: 47950 Episode Num: 1163 Episode T: 13 Reward: 8.800
Total T: 47958 Episode Num: 1164 Episode T: 8 Reward: 9.300
Total T: 47987 Episode Num: 1165 Episode T: 29 Reward: 7.200
recent Evaluation: 3.659999999999988
Total T: 48007 Episode Num: 1166 Episode T: 20 Reward: 8.100
Total T: 48040 Episode Num: 1167 Episode T: 33 Reward: 6.800
Total T: 48106 Episode Num: 1168 Episode T: 66 Reward: -6.600
Total T: 48129 Episode Num: 1169 Episode T: 23 Reward: 7.800
Total T: 48145 Episode Num: 1170 Episode T: 16 Reward: 8.500
Total T: 48168 Episode Num: 1171 Episode T: 23 Reward: 7.800
Total T: 48179 Episode Num: 1172 Episode T: 11 Reward: 9.000
Total T: 48245 Episode Num: 1173 Episode T: 66 Reward: -6.600
Total T: 48246 Episode Num: 1174 Episode T: 1 Reward: 10.000
Total T: 48276 Episode Num: 1175 Episode T: 30 Reward: 7.100
Total T: 48279 Episode Num: 1176 Episode T: 3 Reward: 9.800
Total T: 48309 Episode Num: 1177 Episode T: 30 Reward: 7.100
Total T: 48313 Episode Num: 1178 Episode T: 4 Reward: 9.700
Total T: 48379 Episode Num: 1179 Episode T: 66 Reward: -6.600
Total T: 48445 Episode Num: 1180 Episode T: 66 Reward: -6.600
Total T: 48465 Episode Num: 1181 Episode T: 20 Reward: 8.100
Total T: 48495 Episode Num: 1182 Episode T: 30 Reward: 7.100
Total T: 48561 Episode Num: 1183 Episode T: 66 Reward: -6.600
Total T: 48577 Episode Num: 1184 Episode T: 16 Reward: 8.500
Total T: 48643 Episode Num: 1185 Episode T: 66 Reward: -6.600
Total T: 48709 Episode Num: 1186 Episode T: 66 Reward: -6.600
Total T: 48775 Episode Num: 1187 Episode T: 66 Reward: -6.600
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Total T: 48907 Episode Num: 1189 Episode T: 66 Reward: -6.600
Total T: 48920 Episode Num: 1190 Episode T: 13 Reward: 8.800
Total T: 48986 Episode Num: 1191 Episode T: 66 Reward: -6.600
Total T: 48997 Episode Num: 1192 Episode T: 11 Reward: 9.000
recent Evaluation: 7.309999999999995
Total T: 49063 Episode Num: 1193 Episode T: 66 Reward: -6.600
Total T: 49075 Episode Num: 1194 Episode T: 12 Reward: 8.900
Total T: 49107 Episode Num: 1195 Episode T: 32 Reward: 6.900
Total T: 49137 Episode Num: 1196 Episode T: 30 Reward: 7.100
Total T: 49166 Episode Num: 1197 Episode T: 29 Reward: 7.200
Total T: 49180 Episode Num: 1198 Episode T: 14 Reward: 8.700
Total T: 49191 Episode Num: 1199 Episode T: 11 Reward: 9.000
Total T: 49257 Episode Num: 1200 Episode T: 66 Reward: -6.600
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Total T: 49303 Episode Num: 1202 Episode T: 31 Reward: 7.000
Total T: 49369 Episode Num: 1203 Episode T: 66 Reward: -6.600
Total T: 49384 Episode Num: 1204 Episode T: 15 Reward: 8.600
Total T: 49403 Episode Num: 1205 Episode T: 19 Reward: 8.200
Total T: 49419 Episode Num: 1206 Episode T: 16 Reward: 8.500
Total T: 49423 Episode Num: 1207 Episode T: 4 Reward: 9.700
Total T: 49438 Episode Num: 1208 Episode T: 15 Reward: 8.600
Total T: 49477 Episode Num: 1209 Episode T: 39 Reward: 6.200
Total T: 49510 Episode Num: 1210 Episode T: 33 Reward: 6.800
Total T: 49546 Episode Num: 1211 Episode T: 36 Reward: 6.500
Total T: 49571 Episode Num: 1212 Episode T: 25 Reward: 7.600
Total T: 49593 Episode Num: 1213 Episode T: 22 Reward: 7.900
Total T: 49617 Episode Num: 1214 Episode T: 24 Reward: 7.700
Total T: 49634 Episode Num: 1215 Episode T: 17 Reward: 8.400
Total T: 49651 Episode Num: 1216 Episode T: 17 Reward: 8.400
Total T: 49672 Episode Num: 1217 Episode T: 21 Reward: 8.000
Total T: 49707 Episode Num: 1218 Episode T: 35 Reward: 6.600
Total T: 49709 Episode Num: 1219 Episode T: 2 Reward: 9.900
Total T: 49746 Episode Num: 1220 Episode T: 37 Reward: 6.400
Total T: 49779 Episode Num: 1221 Episode T: 33 Reward: 6.800
Total T: 49790 Episode Num: 1222 Episode T: 11 Reward: 9.000
Total T: 49820 Episode Num: 1223 Episode T: 30 Reward: 7.100
Total T: 49854 Episode Num: 1224 Episode T: 34 Reward: 6.700
Total T: 49868 Episode Num: 1225 Episode T: 14 Reward: 8.700
Total T: 49909 Episode Num: 1226 Episode T: 41 Reward: 6.000
Total T: 49975 Episode Num: 1227 Episode T: 66 Reward: -6.600
recent Evaluation: 2.309999999999967
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Total T: 50080 Episode Num: 1229 Episode T: 39 Reward: 6.200
Total T: 50081 Episode Num: 1230 Episode T: 1 Reward: 10.000
Total T: 50111 Episode Num: 1231 Episode T: 30 Reward: 7.100
Total T: 50177 Episode Num: 1232 Episode T: 66 Reward: -6.600
Total T: 50243 Episode Num: 1233 Episode T: 66 Reward: -6.600
Total T: 50267 Episode Num: 1234 Episode T: 24 Reward: 7.700
Total T: 50333 Episode Num: 1235 Episode T: 66 Reward: -6.600
Total T: 50349 Episode Num: 1236 Episode T: 16 Reward: 8.500
Total T: 50415 Episode Num: 1237 Episode T: 66 Reward: -6.600
Total T: 50433 Episode Num: 1238 Episode T: 18 Reward: 8.300
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Total T: 50534 Episode Num: 1240 Episode T: 66 Reward: -6.600
Total T: 50570 Episode Num: 1241 Episode T: 36 Reward: 6.500
Total T: 50587 Episode Num: 1242 Episode T: 17 Reward: 8.400
Total T: 50606 Episode Num: 1243 Episode T: 19 Reward: 8.200
Total T: 50630 Episode Num: 1244 Episode T: 24 Reward: 7.700
Total T: 50632 Episode Num: 1245 Episode T: 2 Reward: 9.900
Total T: 50645 Episode Num: 1246 Episode T: 13 Reward: 8.800
Total T: 50711 Episode Num: 1247 Episode T: 66 Reward: -6.600
Total T: 50747 Episode Num: 1248 Episode T: 36 Reward: 6.500
Total T: 50780 Episode Num: 1249 Episode T: 33 Reward: 6.800
Total T: 50790 Episode Num: 1250 Episode T: 10 Reward: 9.100
Total T: 50856 Episode Num: 1251 Episode T: 66 Reward: -6.600
Total T: 50859 Episode Num: 1252 Episode T: 3 Reward: 9.800
Total T: 50925 Episode Num: 1253 Episode T: 66 Reward: -6.600
Total T: 50963 Episode Num: 1254 Episode T: 38 Reward: 6.300
recent Evaluation: -0.800000000000078
Total T: 51029 Episode Num: 1255 Episode T: 66 Reward: -6.600
Total T: 51060 Episode Num: 1256 Episode T: 31 Reward: 7.000
Total T: 51074 Episode Num: 1257 Episode T: 14 Reward: 8.700
Total T: 51089 Episode Num: 1258 Episode T: 15 Reward: 8.600
Total T: 51155 Episode Num: 1259 Episode T: 66 Reward: -6.600
Total T: 51168 Episode Num: 1260 Episode T: 13 Reward: 8.800
Total T: 51210 Episode Num: 1261 Episode T: 42 Reward: 5.900

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Total T: 51276 Episode Num: 1262 Episode T: 66 Reward: -6.600
Total T: 51290 Episode Num: 1263 Episode T: 14 Reward: 8.700
Total T: 51356 Episode Num: 1264 Episode T: 66 Reward: -6.600
Total T: 51422 Episode Num: 1265 Episode T: 66 Reward: -6.600
Total T: 51456 Episode Num: 1266 Episode T: 34 Reward: 6.700
Total T: 51522 Episode Num: 1267 Episode T: 66 Reward: -6.600
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Total T: 51558 Episode Num: 1269 Episode T: 11 Reward: 9.000
Total T: 51575 Episode Num: 1270 Episode T: 17 Reward: 8.400
Total T: 51641 Episode Num: 1271 Episode T: 66 Reward: -6.600
Total T: 51667 Episode Num: 1272 Episode T: 26 Reward: 7.500
Total T: 51685 Episode Num: 1273 Episode T: 18 Reward: 8.300
Total T: 51702 Episode Num: 1274 Episode T: 17 Reward: 8.400
Total T: 51768 Episode Num: 1275 Episode T: 66 Reward: -6.600
Total T: 51808 Episode Num: 1276 Episode T: 40 Reward: 6.100
Total T: 51848 Episode Num: 1277 Episode T: 40 Reward: 6.100
Total T: 51882 Episode Num: 1278 Episode T: 34 Reward: 6.700
Total T: 51911 Episode Num: 1279 Episode T: 29 Reward: 7.200
Total T: 51924 Episode Num: 1280 Episode T: 13 Reward: 8.800
Total T: 51949 Episode Num: 1281 Episode T: 25 Reward: 7.600
Total T: 51973 Episode Num: 1282 Episode T: 24 Reward: 7.700
recent Evaluation: 3.9299999999999664
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Total T: 52052 Episode Num: 1284 Episode T: 13 Reward: 8.800
Total T: 52071 Episode Num: 1285 Episode T: 19 Reward: 8.200
Total T: 52078 Episode Num: 1286 Episode T: 7 Reward: 9.400
Total T: 52090 Episode Num: 1287 Episode T: 12 Reward: 8.900
Total T: 52092 Episode Num: 1288 Episode T: 2 Reward: 9.900
Total T: 52158 Episode Num: 1289 Episode T: 66 Reward: -6.600
Total T: 52164 Episode Num: 1290 Episode T: 6 Reward: 9.500
Total T: 52175 Episode Num: 1291 Episode T: 11 Reward: 9.000
Total T: 52241 Episode Num: 1292 Episode T: 66 Reward: -6.600
Total T: 52307 Episode Num: 1293 Episode T: 66 Reward: -6.600
Total T: 52309 Episode Num: 1294 Episode T: 2 Reward: 9.900
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Total T: 52414 Episode Num: 1297 Episode T: 66 Reward: -6.600
Total T: 52480 Episode Num: 1298 Episode T: 66 Reward: -6.600
Total T: 52504 Episode Num: 1299 Episode T: 24 Reward: 7.700
Total T: 52514 Episode Num: 1300 Episode T: 10 Reward: 9.100
Total T: 52580 Episode Num: 1301 Episode T: 66 Reward: -6.600
Total T: 52591 Episode Num: 1302 Episode T: 11 Reward: 9.000
Total T: 52606 Episode Num: 1303 Episode T: 15 Reward: 8.600
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Total T: 52709 Episode Num: 1305 Episode T: 37 Reward: 6.400
Total T: 52775 Episode Num: 1306 Episode T: 66 Reward: -6.600
Total T: 52841 Episode Num: 1307 Episode T: 66 Reward: -6.600
Total T: 52852 Episode Num: 1308 Episode T: 11 Reward: 9.000
Total T: 52918 Episode Num: 1309 Episode T: 66 Reward: -6.600
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recent Evaluation: 2.3699999999999597
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Total T: 53043 Episode Num: 1313 Episode T: 9 Reward: 9.200
Total T: 53109 Episode Num: 1314 Episode T: 66 Reward: -6.600
Total T: 53147 Episode Num: 1315 Episode T: 38 Reward: 6.300
Total T: 53213 Episode Num: 1316 Episode T: 66 Reward: -6.600
Total T: 53253 Episode Num: 1317 Episode T: 40 Reward: 6.100
Total T: 53286 Episode Num: 1318 Episode T: 33 Reward: 6.800
Total T: 53306 Episode Num: 1319 Episode T: 20 Reward: 8.100
Total T: 53372 Episode Num: 1320 Episode T: 66 Reward: -6.600
Total T: 53379 Episode Num: 1321 Episode T: 7 Reward: 9.400
Total T: 53416 Episode Num: 1322 Episode T: 37 Reward: 6.400
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Total T: 53560 Episode Num: 1325 Episode T: 66 Reward: -6.600
Total T: 53593 Episode Num: 1326 Episode T: 33 Reward: 6.800
Total T: 53659 Episode Num: 1327 Episode T: 66 Reward: -6.600
Total T: 53666 Episode Num: 1328 Episode T: 7 Reward: 9.400
Total T: 53732 Episode Num: 1329 Episode T: 66 Reward: -6.600
Total T: 53798 Episode Num: 1330 Episode T: 66 Reward: -6.600
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Total T: 53891 Episode Num: 1332 Episode T: 27 Reward: 7.400
Total T: 53957 Episode Num: 1333 Episode T: 66 Reward: -6.600
Total T: 53974 Episode Num: 1334 Episode T: 17 Reward: 8.400
recent Evaluation: -1.8500000000000174
Total T: 54040 Episode Num: 1335 Episode T: 66 Reward: -6.600
Total T: 54050 Episode Num: 1336 Episode T: 10 Reward: 9.100
Total T: 54089 Episode Num: 1337 Episode T: 39 Reward: 6.200
Total T: 54155 Episode Num: 1338 Episode T: 66 Reward: -6.600
Total T: 54174 Episode Num: 1339 Episode T: 19 Reward: 8.200
Total T: 54188 Episode Num: 1340 Episode T: 14 Reward: 8.700
Total T: 54223 Episode Num: 1341 Episode T: 35 Reward: 6.600
Total T: 54230 Episode Num: 1342 Episode T: 7 Reward: 9.400
Total T: 54296 Episode Num: 1343 Episode T: 66 Reward: -6.600
Total T: 54362 Episode Num: 1344 Episode T: 66 Reward: -6.600
Total T: 54371 Episode Num: 1345 Episode T: 9 Reward: 9.200
Total T: 54437 Episode Num: 1346 Episode T: 66 Reward: -6.600
Total T: 54484 Episode Num: 1347 Episode T: 47 Reward: 5.400
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Total T: 54616 Episode Num: 1349 Episode T: 66 Reward: -6.600
Total T: 54625 Episode Num: 1350 Episode T: 9 Reward: 9.200
Total T: 54691 Episode Num: 1351 Episode T: 66 Reward: -6.600
Total T: 54702 Episode Num: 1352 Episode T: 11 Reward: 9.000
Total T: 54768 Episode Num: 1353 Episode T: 66 Reward: -6.600
Total T: 54777 Episode Num: 1354 Episode T: 9 Reward: 9.200
Total T: 54787 Episode Num: 1355 Episode T: 10 Reward: 9.100
Total T: 54853 Episode Num: 1356 Episode T: 66 Reward: -6.600
Total T: 54865 Episode Num: 1357 Episode T: 12 Reward: 8.900
Total T: 54884 Episode Num: 1358 Episode T: 19 Reward: 8.200
Total T: 54914 Episode Num: 1359 Episode T: 30 Reward: 7.100
Total T: 54980 Episode Num: 1360 Episode T: 66 Reward: -6.600
Total T: 54981 Episode Num: 1361 Episode T: 1 Reward: 10.000
recent Evaluation: 3.999999999999963
Total T: 55047 Episode Num: 1362 Episode T: 66 Reward: -6.600
Total T: 55113 Episode Num: 1363 Episode T: 66 Reward: -6.600
Total T: 55179 Episode Num: 1364 Episode T: 66 Reward: -6.600
Total T: 55190 Episode Num: 1365 Episode T: 11 Reward: 9.000
Total T: 55212 Episode Num: 1366 Episode T: 22 Reward: 7.900
Total T: 55243 Episode Num: 1367 Episode T: 31 Reward: 7.000
Total T: 55309 Episode Num: 1368 Episode T: 66 Reward: -6.600
Total T: 55375 Episode Num: 1369 Episode T: 66 Reward: -6.600
Total T: 55406 Episode Num: 1370 Episode T: 31 Reward: 7.000
Total T: 55418 Episode Num: 1371 Episode T: 12 Reward: 8.900
Total T: 55420 Episode Num: 1372 Episode T: 2 Reward: 9.900
Total T: 55425 Episode Num: 1373 Episode T: 5 Reward: 9.600

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Total T: 55491 Episode Num: 1374 Episode T: 66 Reward: -6.600
Total T: 55494 Episode Num: 1375 Episode T: 3 Reward: 9.800
Total T: 55522 Episode Num: 1376 Episode T: 28 Reward: 7.300
Total T: 55542 Episode Num: 1377 Episode T: 20 Reward: 8.100
Total T: 55552 Episode Num: 1378 Episode T: 10 Reward: 9.100
Total T: 55618 Episode Num: 1379 Episode T: 66 Reward: -6.600
Total T: 55684 Episode Num: 1380 Episode T: 66 Reward: -6.600
Total T: 55714 Episode Num: 1381 Episode T: 30 Reward: 7.100
Total T: 55780 Episode Num: 1382 Episode T: 66 Reward: -6.600
Total T: 55846 Episode Num: 1383 Episode T: 66 Reward: -6.600
Total T: 55912 Episode Num: 1384 Episode T: 66 Reward: -6.600
Total T: 55952 Episode Num: 1385 Episode T: 40 Reward: 6.100
Total T: 55969 Episode Num: 1386 Episode T: 17 Reward: 8.400
recent Evaluation: -0.3899999999999912
Total T: 56019 Episode Num: 1387 Episode T: 50 Reward: 5.100
Total T: 56085 Episode Num: 1388 Episode T: 66 Reward: -6.600
Total T: 56096 Episode Num: 1389 Episode T: 11 Reward: 9.000
Total T: 56132 Episode Num: 1390 Episode T: 36 Reward: 6.500
Total T: 56198 Episode Num: 1391 Episode T: 66 Reward: -6.600
Total T: 56220 Episode Num: 1392 Episode T: 22 Reward: 7.900
Total T: 56286 Episode Num: 1393 Episode T: 66 Reward: -6.600
Total T: 56352 Episode Num: 1394 Episode T: 66 Reward: -6.600
Total T: 56365 Episode Num: 1395 Episode T: 13 Reward: 8.800
Total T: 56367 Episode Num: 1396 Episode T: 2 Reward: 9.900
Total T: 56433 Episode Num: 1397 Episode T: 66 Reward: -6.600
Total T: 56499 Episode Num: 1398 Episode T: 66 Reward: -6.600
Total T: 56534 Episode Num: 1399 Episode T: 35 Reward: 6.600
Total T: 56568 Episode Num: 1400 Episode T: 34 Reward: 6.700
Total T: 56578 Episode Num: 1401 Episode T: 10 Reward: 9.100
Total T: 56591 Episode Num: 1402 Episode T: 13 Reward: 8.800
Total T: 56657 Episode Num: 1403 Episode T: 66 Reward: -6.600
Total T: 56678 Episode Num: 1404 Episode T: 21 Reward: 8.000
Total T: 56696 Episode Num: 1405 Episode T: 18 Reward: 8.300
Total T: 56762 Episode Num: 1406 Episode T: 66 Reward: -6.600
Total T: 56828 Episode Num: 1407 Episode T: 66 Reward: -6.600
Total T: 56845 Episode Num: 1408 Episode T: 17 Reward: 8.400
Total T: 56873 Episode Num: 1409 Episode T: 28 Reward: 7.300
Total T: 56891 Episode Num: 1410 Episode T: 18 Reward: 8.300
Total T: 56905 Episode Num: 1411 Episode T: 14 Reward: 8.700
Total T: 56913 Episode Num: 1412 Episode T: 8 Reward: 9.300
Total T: 56929 Episode Num: 1413 Episode T: 16 Reward: 8.500
Total T: 56957 Episode Num: 1414 Episode T: 28 Reward: 7.300
Total T: 56980 Episode Num: 1415 Episode T: 23 Reward: 7.800
Total T: 56992 Episode Num: 1416 Episode T: 12 Reward: 8.900
recent Evaluation: -5.0700000000000044
Total T: 57058 Episode Num: 1417 Episode T: 66 Reward: -6.600
Total T: 57088 Episode Num: 1418 Episode T: 30 Reward: 7.100
Total T: 57154 Episode Num: 1419 Episode T: 66 Reward: -6.600
Total T: 57220 Episode Num: 1420 Episode T: 66 Reward: -6.600
Total T: 57286 Episode Num: 1421 Episode T: 66 Reward: -6.600
Total T: 57352 Episode Num: 1422 Episode T: 66 Reward: -6.600
Total T: 57418 Episode Num: 1423 Episode T: 66 Reward: -6.600
Total T: 57428 Episode Num: 1424 Episode T: 10 Reward: 9.100
Total T: 57435 Episode Num: 1425 Episode T: 7 Reward: 9.400
Total T: 57501 Episode Num: 1426 Episode T: 66 Reward: -6.600
Total T: 57567 Episode Num: 1427 Episode T: 66 Reward: -6.600
Total T: 57633 Episode Num: 1428 Episode T: 66 Reward: -6.600
Total T: 57699 Episode Num: 1429 Episode T: 66 Reward: -6.600
Total T: 57765 Episode Num: 1430 Episode T: 66 Reward: -6.600
Total T: 57790 Episode Num: 1431 Episode T: 25 Reward: 7.600
Total T: 57856 Episode Num: 1432 Episode T: 66 Reward: -6.600
Total T: 57873 Episode Num: 1433 Episode T: 17 Reward: 8.400
Total T: 57890 Episode Num: 1434 Episode T: 17 Reward: 8.400
Total T: 57900 Episode Num: 1435 Episode T: 10 Reward: 9.100
Total T: 57904 Episode Num: 1436 Episode T: 4 Reward: 9.700
Total T: 57935 Episode Num: 1437 Episode T: 31 Reward: 7.000
Total T: 57951 Episode Num: 1438 Episode T: 16 Reward: 8.500
recent Evaluation: 5.3099999999999845
Total T: 58017 Episode Num: 1439 Episode T: 66 Reward: -6.600
Total T: 58083 Episode Num: 1440 Episode T: 66 Reward: -6.600
Total T: 58149 Episode Num: 1441 Episode T: 66 Reward: -6.600
Total T: 58166 Episode Num: 1442 Episode T: 17 Reward: 8.400
Total T: 58186 Episode Num: 1443 Episode T: 20 Reward: 8.100
Total T: 58220 Episode Num: 1444 Episode T: 34 Reward: 6.700
Total T: 58229 Episode Num: 1445 Episode T: 9 Reward: 9.200
Total T: 58259 Episode Num: 1446 Episode T: 30 Reward: 7.100
Total T: 58275 Episode Num: 1447 Episode T: 16 Reward: 8.500
Total T: 58288 Episode Num: 1448 Episode T: 13 Reward: 8.800
Total T: 58302 Episode Num: 1449 Episode T: 14 Reward: 8.700
Total T: 58368 Episode Num: 1450 Episode T: 66 Reward: -6.600
Total T: 58411 Episode Num: 1451 Episode T: 43 Reward: 5.800
Total T: 58477 Episode Num: 1452 Episode T: 66 Reward: -6.600
Total T: 58543 Episode Num: 1453 Episode T: 66 Reward: -6.600
Total T: 58560 Episode Num: 1454 Episode T: 17 Reward: 8.400
Total T: 58594 Episode Num: 1455 Episode T: 34 Reward: 6.700
Total T: 58660 Episode Num: 1456 Episode T: 66 Reward: -6.600
Total T: 58677 Episode Num: 1457 Episode T: 17 Reward: 8.400
Total T: 58695 Episode Num: 1458 Episode T: 18 Reward: 8.300
Total T: 58761 Episode Num: 1459 Episode T: 66 Reward: -6.600
Total T: 58766 Episode Num: 1460 Episode T: 5 Reward: 9.600
Total T: 58832 Episode Num: 1461 Episode T: 66 Reward: -6.600
Total T: 58851 Episode Num: 1462 Episode T: 19 Reward: 8.200
Total T: 58861 Episode Num: 1463 Episode T: 10 Reward: 9.100
Total T: 58927 Episode Num: 1464 Episode T: 66 Reward: -6.600
Total T: 58993 Episode Num: 1465 Episode T: 66 Reward: -6.600
Total T: 58999 Episode Num: 1466 Episode T: 6 Reward: 9.500
recent Evaluation: 1.1199999999999841
Total T: 59005 Episode Num: 1467 Episode T: 6 Reward: 9.500
Total T: 59071 Episode Num: 1468 Episode T: 66 Reward: -6.600
Total T: 59090 Episode Num: 1469 Episode T: 19 Reward: 8.200
Total T: 59112 Episode Num: 1470 Episode T: 22 Reward: 7.900
Total T: 59123 Episode Num: 1471 Episode T: 11 Reward: 9.000
Total T: 59146 Episode Num: 1472 Episode T: 23 Reward: 7.800
Total T: 59212 Episode Num: 1473 Episode T: 66 Reward: -6.600
Total T: 59220 Episode Num: 1474 Episode T: 8 Reward: 9.300
Total T: 59229 Episode Num: 1475 Episode T: 9 Reward: 9.200
Total T: 59295 Episode Num: 1476 Episode T: 66 Reward: -6.600
Total T: 59337 Episode Num: 1477 Episode T: 42 Reward: 5.900
Total T: 59355 Episode Num: 1478 Episode T: 18 Reward: 8.300
Total T: 59421 Episode Num: 1479 Episode T: 66 Reward: -6.600
Total T: 59458 Episode Num: 1480 Episode T: 37 Reward: 6.400
Total T: 59524 Episode Num: 1481 Episode T: 66 Reward: -6.600
Total T: 59534 Episode Num: 1482 Episode T: 10 Reward: 9.100
Total T: 59564 Episode Num: 1483 Episode T: 30 Reward: 7.100
Total T: 59577 Episode Num: 1484 Episode T: 13 Reward: 8.800
Total T: 59580 Episode Num: 1485 Episode T: 3 Reward: 9.800

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Total T: 59591 Episode Num: 1486 Episode T: 11 Reward: 9.000
Total T: 59657 Episode Num: 1487 Episode T: 66 Reward: -6.600
Total T: 59668 Episode Num: 1488 Episode T: 11 Reward: 9.000
Total T: 59734 Episode Num: 1489 Episode T: 66 Reward: -6.600
Total T: 59747 Episode Num: 1490 Episode T: 13 Reward: 8.800
Total T: 59781 Episode Num: 1491 Episode T: 34 Reward: 6.700
Total T: 59788 Episode Num: 1492 Episode T: 7 Reward: 9.400
Total T: 59854 Episode Num: 1493 Episode T: 66 Reward: -6.600
Total T: 59920 Episode Num: 1494 Episode T: 66 Reward: -6.600
Total T: 59928 Episode Num: 1495 Episode T: 8 Reward: 9.300
Total T: 59994 Episode Num: 1496 Episode T: 66 Reward: -6.600
recent Evaluation: 7.029999999999975
Total T: 60003 Episode Num: 1497 Episode T: 9 Reward: 9.200
Total T: 60069 Episode Num: 1498 Episode T: 66 Reward: -6.600
Total T: 60135 Episode Num: 1499 Episode T: 66 Reward: -6.600
Total T: 60201 Episode Num: 1500 Episode T: 66 Reward: -6.600
Total T: 60206 Episode Num: 1501 Episode T: 5 Reward: 9.600
Total T: 60227 Episode Num: 1502 Episode T: 21 Reward: 8.000
Total T: 60237 Episode Num: 1503 Episode T: 10 Reward: 9.100
Total T: 60260 Episode Num: 1504 Episode T: 23 Reward: 7.800
Total T: 60276 Episode Num: 1505 Episode T: 16 Reward: 8.500
Total T: 60342 Episode Num: 1506 Episode T: 66 Reward: -6.600
Total T: 60344 Episode Num: 1507 Episode T: 2 Reward: 9.900
Total T: 60410 Episode Num: 1508 Episode T: 66 Reward: -6.600
Total T: 60476 Episode Num: 1509 Episode T: 66 Reward: -6.600
Total T: 60487 Episode Num: 1510 Episode T: 11 Reward: 9.000
Total T: 60489 Episode Num: 1511 Episode T: 2 Reward: 9.900
Total T: 60523 Episode Num: 1512 Episode T: 34 Reward: 6.700
Total T: 60534 Episode Num: 1513 Episode T: 11 Reward: 9.000
Total T: 60600 Episode Num: 1514 Episode T: 66 Reward: -6.600
Total T: 60617 Episode Num: 1515 Episode T: 17 Reward: 8.400
Total T: 60629 Episode Num: 1516 Episode T: 12 Reward: 8.900
Total T: 60651 Episode Num: 1517 Episode T: 22 Reward: 7.900
Total T: 60717 Episode Num: 1518 Episode T: 66 Reward: -6.600
Total T: 60718 Episode Num: 1519 Episode T: 1 Reward: 10.000
Total T: 60727 Episode Num: 1520 Episode T: 9 Reward: 9.200
Total T: 60793 Episode Num: 1521 Episode T: 66 Reward: -6.600
Total T: 60834 Episode Num: 1522 Episode T: 41 Reward: 6.000
Total T: 60856 Episode Num: 1523 Episode T: 22 Reward: 7.900
Total T: 60881 Episode Num: 1524 Episode T: 25 Reward: 7.600
Total T: 60885 Episode Num: 1525 Episode T: 4 Reward: 9.700
Total T: 60927 Episode Num: 1526 Episode T: 42 Reward: 5.900
Total T: 60944 Episode Num: 1527 Episode T: 17 Reward: 8.400
recent Evaluation: 2.6799999999999877
Total T: 61010 Episode Num: 1528 Episode T: 66 Reward: -6.600
Total T: 61076 Episode Num: 1529 Episode T: 66 Reward: -6.600
Total T: 61142 Episode Num: 1530 Episode T: 66 Reward: -6.600
Total T: 61170 Episode Num: 1531 Episode T: 28 Reward: 7.300
Total T: 61208 Episode Num: 1532 Episode T: 38 Reward: 6.300
Total T: 61224 Episode Num: 1533 Episode T: 16 Reward: 8.500
Total T: 61228 Episode Num: 1534 Episode T: 4 Reward: 9.700
Total T: 61238 Episode Num: 1535 Episode T: 10 Reward: 9.100
Total T: 61255 Episode Num: 1536 Episode T: 17 Reward: 8.400
Total T: 61285 Episode Num: 1537 Episode T: 30 Reward: 7.100
Total T: 61328 Episode Num: 1538 Episode T: 43 Reward: 5.800
Total T: 61356 Episode Num: 1539 Episode T: 28 Reward: 7.300
Total T: 61379 Episode Num: 1540 Episode T: 23 Reward: 7.800
Total T: 61412 Episode Num: 1541 Episode T: 33 Reward: 6.800
Total T: 61441 Episode Num: 1542 Episode T: 29 Reward: 7.200
Total T: 61464 Episode Num: 1543 Episode T: 23 Reward: 7.800
Total T: 61530 Episode Num: 1544 Episode T: 66 Reward: -6.600
Total T: 61548 Episode Num: 1545 Episode T: 18 Reward: 8.300
Total T: 61571 Episode Num: 1546 Episode T: 23 Reward: 7.800
Total T: 61637 Episode Num: 1547 Episode T: 66 Reward: -6.600
Total T: 61651 Episode Num: 1548 Episode T: 14 Reward: 8.700
Total T: 61717 Episode Num: 1549 Episode T: 66 Reward: -6.600
Total T: 61731 Episode Num: 1550 Episode T: 14 Reward: 8.700
Total T: 61748 Episode Num: 1551 Episode T: 17 Reward: 8.400
Total T: 61757 Episode Num: 1552 Episode T: 9 Reward: 9.200
Total T: 61778 Episode Num: 1553 Episode T: 21 Reward: 8.000
Total T: 61790 Episode Num: 1554 Episode T: 12 Reward: 8.900
Total T: 61814 Episode Num: 1555 Episode T: 24 Reward: 7.700
Total T: 61880 Episode Num: 1556 Episode T: 66 Reward: -6.600
Total T: 61946 Episode Num: 1557 Episode T: 66 Reward: -6.600
Total T: 61957 Episode Num: 1558 Episode T: 11 Reward: 9.000
recent Evaluation: 3.7699999999999976
Total T: 62023 Episode Num: 1559 Episode T: 66 Reward: -6.600
Total T: 62041 Episode Num: 1560 Episode T: 18 Reward: 8.300
Total T: 62107 Episode Num: 1561 Episode T: 66 Reward: -6.600
Total T: 62145 Episode Num: 1562 Episode T: 38 Reward: 6.300
Total T: 62211 Episode Num: 1563 Episode T: 66 Reward: -6.600
Total T: 62217 Episode Num: 1564 Episode T: 6 Reward: 9.500
Total T: 62233 Episode Num: 1565 Episode T: 16 Reward: 8.500
Total T: 62257 Episode Num: 1566 Episode T: 24 Reward: 7.700
Total T: 62266 Episode Num: 1567 Episode T: 9 Reward: 9.200
Total T: 62332 Episode Num: 1568 Episode T: 66 Reward: -6.600
Total T: 62354 Episode Num: 1569 Episode T: 22 Reward: 7.900
Total T: 62383 Episode Num: 1570 Episode T: 29 Reward: 7.200
Total T: 62449 Episode Num: 1571 Episode T: 66 Reward: -6.600
Total T: 62467 Episode Num: 1572 Episode T: 18 Reward: 8.300
Total T: 62533 Episode Num: 1573 Episode T: 66 Reward: -6.600
Total T: 62564 Episode Num: 1574 Episode T: 31 Reward: 7.000
Total T: 62603 Episode Num: 1575 Episode T: 39 Reward: 6.200
Total T: 62669 Episode Num: 1576 Episode T: 66 Reward: -6.600
Total T: 62735 Episode Num: 1577 Episode T: 66 Reward: -6.600
Total T: 62750 Episode Num: 1578 Episode T: 15 Reward: 8.600
Total T: 62776 Episode Num: 1579 Episode T: 26 Reward: 7.500
Total T: 62804 Episode Num: 1580 Episode T: 28 Reward: 7.300
Total T: 62870 Episode Num: 1581 Episode T: 66 Reward: -6.600
Total T: 62936 Episode Num: 1582 Episode T: 66 Reward: -6.600
Total T: 62970 Episode Num: 1583 Episode T: 34 Reward: 6.700
recent Evaluation: 5.3699999999999978
Total T: 63036 Episode Num: 1584 Episode T: 66 Reward: -6.600
Total T: 63102 Episode Num: 1585 Episode T: 66 Reward: -6.600
Total T: 63122 Episode Num: 1586 Episode T: 20 Reward: 8.100
Total T: 63188 Episode Num: 1587 Episode T: 66 Reward: -6.600
Total T: 63211 Episode Num: 1588 Episode T: 23 Reward: 7.800
Total T: 63217 Episode Num: 1589 Episode T: 6 Reward: 9.500
Total T: 63233 Episode Num: 1590 Episode T: 16 Reward: 8.500
Total T: 63252 Episode Num: 1591 Episode T: 19 Reward: 8.200
Total T: 63318 Episode Num: 1592 Episode T: 66 Reward: -6.600
Total T: 63326 Episode Num: 1593 Episode T: 8 Reward: 9.300
Total T: 63350 Episode Num: 1594 Episode T: 24 Reward: 7.700
Total T: 63416 Episode Num: 1595 Episode T: 66 Reward: -6.600
Total T: 63442 Episode Num: 1596 Episode T: 26 Reward: 7.500
Total T: 63508 Episode Num: 1597 Episode T: 66 Reward: -6.600

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Total T: 63535 Episode Num: 1598 Episode T: 27 Reward: 7.400
Total T: 63601 Episode Num: 1599 Episode T: 66 Reward: -6.600
Total T: 63603 Episode Num: 1600 Episode T: 2 Reward: 9.900
Total T: 63611 Episode Num: 1601 Episode T: 8 Reward: 9.300
Total T: 63641 Episode Num: 1602 Episode T: 30 Reward: 7.100
Total T: 63648 Episode Num: 1603 Episode T: 7 Reward: 9.400
Total T: 63684 Episode Num: 1604 Episode T: 36 Reward: 6.500
Total T: 63687 Episode Num: 1605 Episode T: 3 Reward: 9.800
Total T: 63697 Episode Num: 1606 Episode T: 10 Reward: 9.100
Total T: 63763 Episode Num: 1607 Episode T: 66 Reward: -6.600
Total T: 63766 Episode Num: 1608 Episode T: 3 Reward: 9.800
Total T: 63786 Episode Num: 1609 Episode T: 20 Reward: 8.100
Total T: 63829 Episode Num: 1610 Episode T: 43 Reward: 5.800
Total T: 63859 Episode Num: 1611 Episode T: 30 Reward: 7.100
Total T: 63886 Episode Num: 1612 Episode T: 27 Reward: 7.400
Total T: 63897 Episode Num: 1613 Episode T: 11 Reward: 9.000
Total T: 63922 Episode Num: 1614 Episode T: 25 Reward: 7.600
Total T: 63988 Episode Num: 1615 Episode T: 66 Reward: -6.600
recent Evaluation: 3.9700000000000024
Total T: 64007 Episode Num: 1616 Episode T: 19 Reward: 8.200
Total T: 64021 Episode Num: 1617 Episode T: 14 Reward: 8.700
Total T: 64087 Episode Num: 1618 Episode T: 66 Reward: -6.600
Total T: 64097 Episode Num: 1619 Episode T: 10 Reward: 9.100
Total T: 64120 Episode Num: 1620 Episode T: 23 Reward: 7.800
Total T: 64159 Episode Num: 1621 Episode T: 39 Reward: 6.200
Total T: 64169 Episode Num: 1622 Episode T: 10 Reward: 9.100
Total T: 64206 Episode Num: 1623 Episode T: 37 Reward: 6.400
Total T: 64219 Episode Num: 1624 Episode T: 13 Reward: 8.800
Total T: 64232 Episode Num: 1625 Episode T: 13 Reward: 8.800
Total T: 64244 Episode Num: 1626 Episode T: 12 Reward: 8.900
Total T: 64246 Episode Num: 1627 Episode T: 2 Reward: 9.900
Total T: 64251 Episode Num: 1628 Episode T: 5 Reward: 9.600
Total T: 64317 Episode Num: 1629 Episode T: 66 Reward: -6.600
Total T: 64334 Episode Num: 1630 Episode T: 17 Reward: 8.400
Total T: 64355 Episode Num: 1631 Episode T: 21 Reward: 8.000
Total T: 64375 Episode Num: 1632 Episode T: 20 Reward: 8.100
Total T: 64382 Episode Num: 1633 Episode T: 7 Reward: 9.400
Total T: 64393 Episode Num: 1634 Episode T: 11 Reward: 9.000
Total T: 64428 Episode Num: 1635 Episode T: 35 Reward: 6.600
Total T: 64494 Episode Num: 1636 Episode T: 66 Reward: -6.600
Total T: 64504 Episode Num: 1637 Episode T: 10 Reward: 9.100
Total T: 64514 Episode Num: 1638 Episode T: 10 Reward: 9.100
Total T: 64550 Episode Num: 1639 Episode T: 36 Reward: 6.500
Total T: 64616 Episode Num: 1640 Episode T: 66 Reward: -6.600
Total T: 64682 Episode Num: 1641 Episode T: 66 Reward: -6.600
Total T: 64748 Episode Num: 1642 Episode T: 66 Reward: -6.600
Total T: 64758 Episode Num: 1643 Episode T: 10 Reward: 9.100
Total T: 64779 Episode Num: 1644 Episode T: 21 Reward: 8.000
Total T: 64845 Episode Num: 1645 Episode T: 66 Reward: -6.600
Total T: 64852 Episode Num: 1646 Episode T: 7 Reward: 9.400
Total T: 64879 Episode Num: 1647 Episode T: 27 Reward: 7.400
Total T: 64911 Episode Num: 1648 Episode T: 32 Reward: 6.900
Total T: 64915 Episode Num: 1649 Episode T: 4 Reward: 9.700
Total T: 64922 Episode Num: 1650 Episode T: 7 Reward: 9.400
Total T: 64944 Episode Num: 1651 Episode T: 22 Reward: 7.900
Total T: 64980 Episode Num: 1652 Episode T: 36 Reward: 6.500
Total T: 64997 Episode Num: 1653 Episode T: 17 Reward: 8.400
recent Evaluation: 5.459999999999981
Total T: 65040 Episode Num: 1654 Episode T: 43 Reward: 5.800
Total T: 65043 Episode Num: 1655 Episode T: 3 Reward: 9.800
Total T: 65062 Episode Num: 1656 Episode T: 19 Reward: 8.200
Total T: 65102 Episode Num: 1657 Episode T: 40 Reward: 6.100
Total T: 65112 Episode Num: 1658 Episode T: 10 Reward: 9.100
Total T: 65178 Episode Num: 1659 Episode T: 66 Reward: -6.600
Total T: 65244 Episode Num: 1660 Episode T: 66 Reward: -6.600
Total T: 65253 Episode Num: 1661 Episode T: 9 Reward: 9.200
Total T: 65258 Episode Num: 1662 Episode T: 5 Reward: 9.600
Total T: 65280 Episode Num: 1663 Episode T: 22 Reward: 7.900
Total T: 65318 Episode Num: 1664 Episode T: 38 Reward: 6.300
Total T: 65343 Episode Num: 1665 Episode T: 25 Reward: 7.600
Total T: 65409 Episode Num: 1666 Episode T: 66 Reward: -6.600
Total T: 65475 Episode Num: 1667 Episode T: 66 Reward: -6.600
Total T: 65510 Episode Num: 1668 Episode T: 35 Reward: 6.600
Total T: 65522 Episode Num: 1669 Episode T: 12 Reward: 8.900
Total T: 65538 Episode Num: 1670 Episode T: 16 Reward: 8.500
Total T: 65559 Episode Num: 1671 Episode T: 21 Reward: 8.000
Total T: 65608 Episode Num: 1672 Episode T: 49 Reward: 5.200
Total T: 65626 Episode Num: 1673 Episode T: 18 Reward: 8.300
Total T: 65649 Episode Num: 1674 Episode T: 23 Reward: 7.800
Total T: 65686 Episode Num: 1675 Episode T: 37 Reward: 6.400
Total T: 65710 Episode Num: 1676 Episode T: 24 Reward: 7.700
Total T: 65738 Episode Num: 1677 Episode T: 28 Reward: 7.300
Total T: 65804 Episode Num: 1678 Episode T: 66 Reward: -6.600
Total T: 65843 Episode Num: 1679 Episode T: 39 Reward: 6.200
Total T: 65909 Episode Num: 1680 Episode T: 66 Reward: -6.600
Total T: 65949 Episode Num: 1681 Episode T: 40 Reward: 6.100
Total T: 65970 Episode Num: 1682 Episode T: 21 Reward: 8.000
recent Evaluation: 3.5399999999999947
Total T: 66036 Episode Num: 1683 Episode T: 66 Reward: -6.600
Total T: 66054 Episode Num: 1684 Episode T: 18 Reward: 8.300
Total T: 66120 Episode Num: 1685 Episode T: 66 Reward: -6.600
Total T: 66137 Episode Num: 1686 Episode T: 17 Reward: 8.400
Total T: 66203 Episode Num: 1687 Episode T: 66 Reward: -6.600
Total T: 66269 Episode Num: 1688 Episode T: 66 Reward: -6.600
Total T: 66307 Episode Num: 1689 Episode T: 38 Reward: 6.300
Total T: 66312 Episode Num: 1690 Episode T: 5 Reward: 9.600
Total T: 66314 Episode Num: 1691 Episode T: 2 Reward: 9.900
Total T: 66349 Episode Num: 1692 Episode T: 35 Reward: 6.600
Total T: 66365 Episode Num: 1693 Episode T: 16 Reward: 8.500
Total T: 66404 Episode Num: 1694 Episode T: 39 Reward: 6.200
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Total T: 66472 Episode Num: 1697 Episode T: 21 Reward: 8.000
Total T: 66495 Episode Num: 1698 Episode T: 23 Reward: 7.800
Total T: 66561 Episode Num: 1699 Episode T: 66 Reward: -6.600
Total T: 66574 Episode Num: 1700 Episode T: 13 Reward: 8.800
Total T: 66607 Episode Num: 1701 Episode T: 33 Reward: 6.800
Total T: 66620 Episode Num: 1702 Episode T: 13 Reward: 8.800
Total T: 66647 Episode Num: 1703 Episode T: 27 Reward: 7.400
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Total T: 66679 Episode Num: 1705 Episode T: 14 Reward: 8.700
Total T: 66710 Episode Num: 1706 Episode T: 31 Reward: 7.000
Total T: 66732 Episode Num: 1707 Episode T: 22 Reward: 7.900
Total T: 66798 Episode Num: 1708 Episode T: 66 Reward: -6.600
Total T: 66823 Episode Num: 1709 Episode T: 25 Reward: 7.600
Total T: 66856 Episode Num: 1710 Episode T: 33 Reward: 6.800

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Total T: 66922 Episode Num: 1711 Episode T: 66 Reward: -6.600
Total T: 66947 Episode Num: 1712 Episode T: 25 Reward: 7.600
Total T: 66952 Episode Num: 1713 Episode T: 5 Reward: 9.600
Total T: 66957 Episode Num: 1714 Episode T: 5 Reward: 9.600
Total T: 66985 Episode Num: 1715 Episode T: 28 Reward: 7.300
recent Evaluation: 3.609999999999965
Total T: 67017 Episode Num: 1716 Episode T: 32 Reward: 6.900
Total T: 67045 Episode Num: 1717 Episode T: 28 Reward: 7.300
Total T: 67063 Episode Num: 1718 Episode T: 18 Reward: 8.300
Total T: 67095 Episode Num: 1719 Episode T: 32 Reward: 6.900
Total T: 67131 Episode Num: 1720 Episode T: 36 Reward: 6.500
Total T: 67137 Episode Num: 1721 Episode T: 6 Reward: 9.500
Total T: 67149 Episode Num: 1722 Episode T: 12 Reward: 8.900
Total T: 67170 Episode Num: 1723 Episode T: 21 Reward: 8.000
Total T: 67183 Episode Num: 1724 Episode T: 13 Reward: 8.800
Total T: 67202 Episode Num: 1725 Episode T: 19 Reward: 8.200
Total T: 67247 Episode Num: 1726 Episode T: 45 Reward: 5.600
Total T: 67262 Episode Num: 1727 Episode T: 15 Reward: 8.600
Total T: 67277 Episode Num: 1728 Episode T: 15 Reward: 8.600
Total T: 67306 Episode Num: 1729 Episode T: 29 Reward: 7.200
Total T: 67372 Episode Num: 1730 Episode T: 66 Reward: -6.600
Total T: 67438 Episode Num: 1731 Episode T: 66 Reward: -6.600
Total T: 67452 Episode Num: 1732 Episode T: 14 Reward: 8.700
Total T: 67468 Episode Num: 1733 Episode T: 16 Reward: 8.500
Total T: 67491 Episode Num: 1734 Episode T: 23 Reward: 7.800
Total T: 67507 Episode Num: 1735 Episode T: 16 Reward: 8.500
Total T: 67566 Episode Num: 1736 Episode T: 59 Reward: 4.200
Total T: 67574 Episode Num: 1737 Episode T: 8 Reward: 9.300
Total T: 67581 Episode Num: 1738 Episode T: 7 Reward: 9.400
Total T: 67610 Episode Num: 1739 Episode T: 29 Reward: 7.200
Total T: 67676 Episode Num: 1740 Episode T: 66 Reward: -6.600
Total T: 67714 Episode Num: 1741 Episode T: 38 Reward: 6.300
Total T: 67780 Episode Num: 1742 Episode T: 66 Reward: -6.600
Total T: 67822 Episode Num: 1743 Episode T: 42 Reward: 5.900
Total T: 67888 Episode Num: 1744 Episode T: 66 Reward: -6.600
Total T: 67918 Episode Num: 1745 Episode T: 30 Reward: 7.100
Total T: 67934 Episode Num: 1746 Episode T: 16 Reward: 8.500
Total T: 67995 Episode Num: 1747 Episode T: 61 Reward: 4.000
recent Evaluation: 8.479999999999999
Total T: 68006 Episode Num: 1748 Episode T: 11 Reward: 9.000
Total T: 68072 Episode Num: 1749 Episode T: 66 Reward: -6.600
Total T: 68099 Episode Num: 1750 Episode T: 27 Reward: 7.400
Total T: 68117 Episode Num: 1751 Episode T: 18 Reward: 8.300
Total T: 68143 Episode Num: 1752 Episode T: 26 Reward: 7.500
Total T: 68209 Episode Num: 1753 Episode T: 66 Reward: -6.600
Total T: 68240 Episode Num: 1754 Episode T: 31 Reward: 7.000
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Total T: 68314 Episode Num: 1756 Episode T: 23 Reward: 7.800
Total T: 68325 Episode Num: 1757 Episode T: 11 Reward: 9.000
Total T: 68343 Episode Num: 1758 Episode T: 18 Reward: 8.300
Total T: 68367 Episode Num: 1759 Episode T: 24 Reward: 7.700
Total T: 68396 Episode Num: 1760 Episode T: 29 Reward: 7.200
Total T: 68425 Episode Num: 1761 Episode T: 29 Reward: 7.200
Total T: 68453 Episode Num: 1762 Episode T: 28 Reward: 7.300
Total T: 68519 Episode Num: 1763 Episode T: 66 Reward: -6.600
Total T: 68585 Episode Num: 1764 Episode T: 66 Reward: -6.600
Total T: 68614 Episode Num: 1765 Episode T: 29 Reward: 7.200
Total T: 68638 Episode Num: 1766 Episode T: 24 Reward: 7.700
Total T: 68673 Episode Num: 1767 Episode T: 35 Reward: 6.600
Total T: 68679 Episode Num: 1768 Episode T: 6 Reward: 9.500
Total T: 68713 Episode Num: 1769 Episode T: 34 Reward: 6.700
Total T: 68746 Episode Num: 1770 Episode T: 33 Reward: 6.800
Total T: 68758 Episode Num: 1771 Episode T: 12 Reward: 8.900
Total T: 68764 Episode Num: 1772 Episode T: 6 Reward: 9.500
Total T: 68773 Episode Num: 1773 Episode T: 9 Reward: 9.200
Total T: 68797 Episode Num: 1774 Episode T: 24 Reward: 7.700
Total T: 68808 Episode Num: 1775 Episode T: 11 Reward: 9.000
Total T: 68813 Episode Num: 1776 Episode T: 5 Reward: 9.600
Total T: 68824 Episode Num: 1777 Episode T: 11 Reward: 9.000
Total T: 68850 Episode Num: 1778 Episode T: 26 Reward: 7.500
Total T: 68858 Episode Num: 1779 Episode T: 8 Reward: 9.300
Total T: 68873 Episode Num: 1780 Episode T: 15 Reward: 8.600
Total T: 68913 Episode Num: 1781 Episode T: 40 Reward: 6.100
Total T: 68925 Episode Num: 1782 Episode T: 12 Reward: 8.900
Total T: 68941 Episode Num: 1783 Episode T: 16 Reward: 8.500
Total T: 68950 Episode Num: 1784 Episode T: 9 Reward: 9.200
Total T: 68956 Episode Num: 1785 Episode T: 6 Reward: 9.500
Total T: 68971 Episode Num: 1786 Episode T: 15 Reward: 8.600
Total T: 68990 Episode Num: 1787 Episode T: 19 Reward: 8.200
recent Evaluation: 8.430000000000001
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Total T: 69053 Episode Num: 1789 Episode T: 27 Reward: 7.400
Total T: 69076 Episode Num: 1790 Episode T: 23 Reward: 7.800
Total T: 69096 Episode Num: 1791 Episode T: 20 Reward: 8.100
Total T: 69099 Episode Num: 1792 Episode T: 3 Reward: 9.800
Total T: 69111 Episode Num: 1793 Episode T: 12 Reward: 8.900
Total T: 69177 Episode Num: 1794 Episode T: 66 Reward: -6.600
Total T: 69243 Episode Num: 1795 Episode T: 66 Reward: -6.600
Total T: 69250 Episode Num: 1796 Episode T: 7 Reward: 9.400
Total T: 69316 Episode Num: 1797 Episode T: 66 Reward: -6.600
Total T: 69382 Episode Num: 1798 Episode T: 66 Reward: -6.600
Total T: 69403 Episode Num: 1799 Episode T: 21 Reward: 8.000
Total T: 69469 Episode Num: 1800 Episode T: 66 Reward: -6.600
Total T: 69484 Episode Num: 1801 Episode T: 15 Reward: 8.600
Total T: 69550 Episode Num: 1802 Episode T: 66 Reward: -6.600
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Total T: 69606 Episode Num: 1804 Episode T: 31 Reward: 7.000
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Total T: 69697 Episode Num: 1806 Episode T: 25 Reward: 7.600
Total T: 69763 Episode Num: 1807 Episode T: 66 Reward: -6.600
Total T: 69829 Episode Num: 1808 Episode T: 66 Reward: -6.600
Total T: 69861 Episode Num: 1809 Episode T: 32 Reward: 6.900
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recent Evaluation: 4.159999999999963
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Total T: 70042 Episode Num: 1813 Episode T: 15 Reward: 8.600
Total T: 70108 Episode Num: 1814 Episode T: 66 Reward: -6.600
Total T: 70174 Episode Num: 1815 Episode T: 66 Reward: -6.600
Total T: 70184 Episode Num: 1816 Episode T: 10 Reward: 9.100
Total T: 70250 Episode Num: 1817 Episode T: 66 Reward: -6.600
Total T: 70264 Episode Num: 1818 Episode T: 14 Reward: 8.700
Total T: 70330 Episode Num: 1819 Episode T: 66 Reward: -6.600
Total T: 70361 Episode Num: 1820 Episode T: 31 Reward: 7.000
Total T: 70367 Episode Num: 1821 Episode T: 6 Reward: 9.500
Total T: 70433 Episode Num: 1822 Episode T: 66 Reward: -6.600

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Total T: 70499 Episode Num: 1823 Episode T: 66 Reward: -6.600
Total T: 70565 Episode Num: 1824 Episode T: 66 Reward: -6.600
Total T: 70631 Episode Num: 1825 Episode T: 66 Reward: -6.600
Total T: 70697 Episode Num: 1826 Episode T: 66 Reward: -6.600
Total T: 70763 Episode Num: 1827 Episode T: 66 Reward: -6.600
Total T: 70775 Episode Num: 1828 Episode T: 12 Reward: 8.900
Total T: 70782 Episode Num: 1829 Episode T: 7 Reward: 9.400
Total T: 70848 Episode Num: 1830 Episode T: 66 Reward: -6.600
Total T: 70914 Episode Num: 1831 Episode T: 66 Reward: -6.600
Total T: 70980 Episode Num: 1832 Episode T: 66 Reward: -6.600
recent Evaluation: -1.970000000000023
Total T: 71015 Episode Num: 1833 Episode T: 35 Reward: 6.600
Total T: 71020 Episode Num: 1834 Episode T: 5 Reward: 9.600
Total T: 71046 Episode Num: 1835 Episode T: 26 Reward: 7.500
Total T: 71063 Episode Num: 1836 Episode T: 17 Reward: 8.400
Total T: 71073 Episode Num: 1837 Episode T: 10 Reward: 9.100
Total T: 71139 Episode Num: 1838 Episode T: 66 Reward: -6.600
Total T: 71149 Episode Num: 1839 Episode T: 10 Reward: 9.100
Total T: 71215 Episode Num: 1840 Episode T: 66 Reward: -6.600
Total T: 71281 Episode Num: 1841 Episode T: 66 Reward: -6.600
Total T: 71294 Episode Num: 1842 Episode T: 13 Reward: 8.800
Total T: 71360 Episode Num: 1843 Episode T: 66 Reward: -6.600
Total T: 71426 Episode Num: 1844 Episode T: 66 Reward: -6.600
Total T: 71492 Episode Num: 1845 Episode T: 66 Reward: -6.600
Total T: 71514 Episode Num: 1846 Episode T: 22 Reward: 7.900
Total T: 71524 Episode Num: 1847 Episode T: 10 Reward: 9.100
Total T: 71548 Episode Num: 1848 Episode T: 24 Reward: 7.700
Total T: 71614 Episode Num: 1849 Episode T: 66 Reward: -6.600
Total T: 71628 Episode Num: 1850 Episode T: 14 Reward: 8.700
Total T: 71694 Episode Num: 1851 Episode T: 66 Reward: -6.600
Total T: 71710 Episode Num: 1852 Episode T: 16 Reward: 8.500
Total T: 71727 Episode Num: 1853 Episode T: 17 Reward: 8.400
Total T: 71793 Episode Num: 1854 Episode T: 66 Reward: -6.600
Total T: 71801 Episode Num: 1855 Episode T: 8 Reward: 9.300
Total T: 71817 Episode Num: 1856 Episode T: 16 Reward: 8.500
Total T: 71825 Episode Num: 1857 Episode T: 8 Reward: 9.300
Total T: 71841 Episode Num: 1858 Episode T: 16 Reward: 8.500
Total T: 71858 Episode Num: 1859 Episode T: 17 Reward: 8.400
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Total T: 71930 Episode Num: 1861 Episode T: 6 Reward: 9.500
Total T: 71996 Episode Num: 1862 Episode T: 66 Reward: -6.600
recent Evaluation: 0.9000000000000012
Total T: 72062 Episode Num: 1863 Episode T: 66 Reward: -6.600
Total T: 72078 Episode Num: 1864 Episode T: 16 Reward: 8.500
Total T: 72120 Episode Num: 1865 Episode T: 42 Reward: 5.900
Total T: 72186 Episode Num: 1866 Episode T: 66 Reward: -6.600
Total T: 72192 Episode Num: 1867 Episode T: 6 Reward: 9.500
Total T: 72258 Episode Num: 1868 Episode T: 66 Reward: -6.600
Total T: 72324 Episode Num: 1869 Episode T: 66 Reward: -6.600
Total T: 72390 Episode Num: 1870 Episode T: 66 Reward: -6.600
Total T: 72456 Episode Num: 1871 Episode T: 66 Reward: -6.600
Total T: 72464 Episode Num: 1872 Episode T: 8 Reward: 9.300
Total T: 72488 Episode Num: 1873 Episode T: 24 Reward: 7.700
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Total T: 72599 Episode Num: 1875 Episode T: 66 Reward: -6.600
Total T: 72609 Episode Num: 1876 Episode T: 10 Reward: 9.100
Total T: 72675 Episode Num: 1877 Episode T: 66 Reward: -6.600
Total T: 72741 Episode Num: 1878 Episode T: 66 Reward: -6.600
Total T: 72759 Episode Num: 1879 Episode T: 18 Reward: 8.300
Total T: 72780 Episode Num: 1880 Episode T: 21 Reward: 8.000
Total T: 72846 Episode Num: 1881 Episode T: 66 Reward: -6.600
Total T: 72912 Episode Num: 1882 Episode T: 66 Reward: -6.600
Total T: 72924 Episode Num: 1883 Episode T: 12 Reward: 8.900
Total T: 72949 Episode Num: 1884 Episode T: 25 Reward: 7.600
recent Evaluation: 4.2099999999999994
Total T: 73015 Episode Num: 1885 Episode T: 66 Reward: -6.600
Total T: 73081 Episode Num: 1886 Episode T: 66 Reward: -6.600
Total T: 73097 Episode Num: 1887 Episode T: 16 Reward: 8.500
Total T: 73107 Episode Num: 1888 Episode T: 10 Reward: 9.100
Total T: 73123 Episode Num: 1889 Episode T: 16 Reward: 8.500
Total T: 73138 Episode Num: 1890 Episode T: 15 Reward: 8.600
Total T: 73204 Episode Num: 1891 Episode T: 66 Reward: -6.600
Total T: 73219 Episode Num: 1892 Episode T: 15 Reward: 8.600
Total T: 73239 Episode Num: 1893 Episode T: 20 Reward: 8.100
Total T: 73247 Episode Num: 1894 Episode T: 8 Reward: 9.300
Total T: 73313 Episode Num: 1895 Episode T: 66 Reward: -6.600
Total T: 73379 Episode Num: 1896 Episode T: 66 Reward: -6.600
Total T: 73393 Episode Num: 1897 Episode T: 14 Reward: 8.700
Total T: 73459 Episode Num: 1898 Episode T: 66 Reward: -6.600
Total T: 73464 Episode Num: 1899 Episode T: 5 Reward: 9.600
Total T: 73467 Episode Num: 1900 Episode T: 3 Reward: 9.800
Total T: 73478 Episode Num: 1901 Episode T: 11 Reward: 9.000
Total T: 73491 Episode Num: 1902 Episode T: 13 Reward: 8.800
Total T: 73519 Episode Num: 1903 Episode T: 28 Reward: 7.300
Total T: 73534 Episode Num: 1904 Episode T: 15 Reward: 8.600
Total T: 73551 Episode Num: 1905 Episode T: 17 Reward: 8.400
Total T: 73617 Episode Num: 1906 Episode T: 66 Reward: -6.600
Total T: 73683 Episode Num: 1907 Episode T: 66 Reward: -6.600
Total T: 73749 Episode Num: 1908 Episode T: 66 Reward: -6.600
Total T: 73762 Episode Num: 1909 Episode T: 13 Reward: 8.800
Total T: 73769 Episode Num: 1910 Episode T: 7 Reward: 9.400
Total T: 73787 Episode Num: 1911 Episode T: 18 Reward: 8.300
Total T: 73801 Episode Num: 1912 Episode T: 14 Reward: 8.700
Total T: 73867 Episode Num: 1913 Episode T: 66 Reward: -6.600
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recent Evaluation: -0.5599999999999994
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Total T: 74330 Episode Num: 1921 Episode T: 66 Reward: -6.600
Total T: 74356 Episode Num: 1922 Episode T: 26 Reward: 7.500
Total T: 74366 Episode Num: 1923 Episode T: 10 Reward: 9.100
Total T: 74384 Episode Num: 1924 Episode T: 18 Reward: 8.300
Total T: 74450 Episode Num: 1925 Episode T: 66 Reward: -6.600
Total T: 74463 Episode Num: 1926 Episode T: 13 Reward: 8.800
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Total T: 74548 Episode Num: 1928 Episode T: 66 Reward: -6.600
Total T: 74614 Episode Num: 1929 Episode T: 66 Reward: -6.600
Total T: 74631 Episode Num: 1930 Episode T: 17 Reward: 8.400
Total T: 74646 Episode Num: 1931 Episode T: 15 Reward: 8.600
Total T: 74665 Episode Num: 1932 Episode T: 19 Reward: 8.200
Total T: 74731 Episode Num: 1933 Episode T: 66 Reward: -6.600
Total T: 74797 Episode Num: 1934 Episode T: 66 Reward: -6.600

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Total T: 74808 Episode Num: 1935 Episode T: 11 Reward: 9.000
Total T: 74837 Episode Num: 1936 Episode T: 29 Reward: 7.200
Total T: 74903 Episode Num: 1937 Episode T: 66 Reward: -6.600
Total T: 74969 Episode Num: 1938 Episode T: 66 Reward: -6.600
Total T: 74994 Episode Num: 1939 Episode T: 25 Reward: 7.600
recent Evaluation: 1.2899999999999785
Total T: 75010 Episode Num: 1940 Episode T: 16 Reward: 8.500
Total T: 75020 Episode Num: 1941 Episode T: 10 Reward: 9.100
Total T: 75086 Episode Num: 1942 Episode T: 66 Reward: -6.600
Total T: 75093 Episode Num: 1943 Episode T: 7 Reward: 9.400
Total T: 75159 Episode Num: 1944 Episode T: 66 Reward: -6.600
Total T: 75225 Episode Num: 1945 Episode T: 66 Reward: -6.600
Total T: 75242 Episode Num: 1946 Episode T: 17 Reward: 8.400
Total T: 75255 Episode Num: 1947 Episode T: 13 Reward: 8.800
Total T: 75288 Episode Num: 1948 Episode T: 33 Reward: 6.800
Total T: 75291 Episode Num: 1949 Episode T: 3 Reward: 9.800
Total T: 75357 Episode Num: 1950 Episode T: 66 Reward: -6.600
Total T: 75374 Episode Num: 1951 Episode T: 17 Reward: 8.400
Total T: 75440 Episode Num: 1952 Episode T: 66 Reward: -6.600
Total T: 75449 Episode Num: 1953 Episode T: 9 Reward: 9.200
Total T: 75515 Episode Num: 1954 Episode T: 66 Reward: -6.600
Total T: 75581 Episode Num: 1955 Episode T: 66 Reward: -6.600
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Total T: 75650 Episode Num: 1957 Episode T: 19 Reward: 8.200
Total T: 75716 Episode Num: 1958 Episode T: 66 Reward: -6.600
Total T: 75782 Episode Num: 1959 Episode T: 66 Reward: -6.600
Total T: 75848 Episode Num: 1960 Episode T: 66 Reward: -6.600
Total T: 75867 Episode Num: 1961 Episode T: 19 Reward: 8.200
Total T: 75933 Episode Num: 1962 Episode T: 66 Reward: -6.600
Total T: 75939 Episode Num: 1963 Episode T: 6 Reward: 9.500
Total T: 75950 Episode Num: 1964 Episode T: 11 Reward: 9.000
recent Evaluation: 4.31999999999997
Total T: 76016 Episode Num: 1965 Episode T: 66 Reward: -6.600
Total T: 76082 Episode Num: 1966 Episode T: 66 Reward: -6.600
Total T: 76090 Episode Num: 1967 Episode T: 8 Reward: 9.300
Total T: 76105 Episode Num: 1968 Episode T: 15 Reward: 8.600
Total T: 76171 Episode Num: 1969 Episode T: 66 Reward: -6.600
Total T: 76237 Episode Num: 1970 Episode T: 66 Reward: -6.600
Total T: 76244 Episode Num: 1971 Episode T: 7 Reward: 9.400
Total T: 76310 Episode Num: 1972 Episode T: 66 Reward: -6.600
Total T: 76318 Episode Num: 1973 Episode T: 8 Reward: 9.300
Total T: 76328 Episode Num: 1974 Episode T: 10 Reward: 9.100
Total T: 76357 Episode Num: 1975 Episode T: 29 Reward: 7.200
Total T: 76373 Episode Num: 1976 Episode T: 16 Reward: 8.500
Total T: 76383 Episode Num: 1977 Episode T: 10 Reward: 9.100
Total T: 76395 Episode Num: 1978 Episode T: 12 Reward: 8.900
Total T: 76414 Episode Num: 1979 Episode T: 19 Reward: 8.200
Total T: 76480 Episode Num: 1980 Episode T: 66 Reward: -6.600
Total T: 76501 Episode Num: 1981 Episode T: 21 Reward: 8.000
Total T: 76516 Episode Num: 1982 Episode T: 15 Reward: 8.600
Total T: 76534 Episode Num: 1983 Episode T: 18 Reward: 8.300
Total T: 76600 Episode Num: 1984 Episode T: 66 Reward: -6.600
Total T: 76605 Episode Num: 1985 Episode T: 5 Reward: 9.600
Total T: 76611 Episode Num: 1986 Episode T: 6 Reward: 9.500
Total T: 76620 Episode Num: 1987 Episode T: 9 Reward: 9.200
Total T: 76686 Episode Num: 1988 Episode T: 66 Reward: -6.600
Total T: 76752 Episode Num: 1989 Episode T: 66 Reward: -6.600
Total T: 76754 Episode Num: 1990 Episode T: 2 Reward: 9.900
Total T: 76820 Episode Num: 1991 Episode T: 66 Reward: -6.600
Total T: 76830 Episode Num: 1992 Episode T: 10 Reward: 9.100
Total T: 76896 Episode Num: 1993 Episode T: 66 Reward: -6.600
Total T: 76962 Episode Num: 1994 Episode T: 66 Reward: -6.600
recent Evaluation: 4.2199999999999696
Total T: 77028 Episode Num: 1995 Episode T: 66 Reward: -6.600
Total T: 77038 Episode Num: 1996 Episode T: 10 Reward: 9.100
Total T: 77060 Episode Num: 1997 Episode T: 22 Reward: 7.900
Total T: 77063 Episode Num: 1998 Episode T: 3 Reward: 9.800
Total T: 77083 Episode Num: 1999 Episode T: 20 Reward: 8.100
Total T: 77084 Episode Num: 2000 Episode T: 1 Reward: 10.000
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Total T: 77232 Episode Num: 2005 Episode T: 3 Reward: 9.800
Total T: 77233 Episode Num: 2006 Episode T: 1 Reward: 10.000
Total T: 77253 Episode Num: 2007 Episode T: 20 Reward: 8.100
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Total T: 77398 Episode Num: 2012 Episode T: 3 Reward: 9.800
Total T: 77406 Episode Num: 2013 Episode T: 8 Reward: 9.300
Total T: 77472 Episode Num: 2014 Episode T: 66 Reward: -6.600
Total T: 77515 Episode Num: 2015 Episode T: 43 Reward: 5.800
Total T: 77527 Episode Num: 2016 Episode T: 12 Reward: 8.900
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Total T: 77798 Episode Num: 2024 Episode T: 66 Reward: -6.600
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Total T: 77861 Episode Num: 2028 Episode T: 9 Reward: 9.200
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Total T: 77940 Episode Num: 2030 Episode T: 66 Reward: -6.600
Total T: 77950 Episode Num: 2031 Episode T: 10 Reward: 9.100
recent Evaluation: -1.9600000000000168
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Total T: 78051 Episode Num: 2034 Episode T: 12 Reward: 8.900
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Total T: 78116 Episode Num: 2036 Episode T: 13 Reward: 8.800
Total T: 78182 Episode Num: 2037 Episode T: 66 Reward: -6.600
Total T: 78248 Episode Num: 2038 Episode T: 66 Reward: -6.600
Total T: 78260 Episode Num: 2039 Episode T: 12 Reward: 8.900
Total T: 78267 Episode Num: 2040 Episode T: 7 Reward: 9.400
Total T: 78333 Episode Num: 2041 Episode T: 66 Reward: -6.600
Total T: 78346 Episode Num: 2042 Episode T: 13 Reward: 8.800
Total T: 78356 Episode Num: 2043 Episode T: 10 Reward: 9.100
Total T: 78364 Episode Num: 2044 Episode T: 8 Reward: 9.300
Total T: 78430 Episode Num: 2045 Episode T: 66 Reward: -6.600
Total T: 78435 Episode Num: 2046 Episode T: 5 Reward: 9.600

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Total T: 78459 Episode Num: 2047 Episode T: 24 Reward: 7.700
Total T: 78469 Episode Num: 2048 Episode T: 10 Reward: 9.100
Total T: 78479 Episode Num: 2049 Episode T: 10 Reward: 9.100
Total T: 78545 Episode Num: 2050 Episode T: 66 Reward: -6.600
Total T: 78611 Episode Num: 2051 Episode T: 66 Reward: -6.600
Total T: 78677 Episode Num: 2052 Episode T: 66 Reward: -6.600
Total T: 78702 Episode Num: 2053 Episode T: 25 Reward: 7.600
Total T: 78704 Episode Num: 2054 Episode T: 2 Reward: 9.900
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Total T: 78798 Episode Num: 2056 Episode T: 28 Reward: 7.300
Total T: 78808 Episode Num: 2057 Episode T: 10 Reward: 9.100
Total T: 78825 Episode Num: 2058 Episode T: 17 Reward: 8.400
Total T: 78863 Episode Num: 2059 Episode T: 38 Reward: 6.300
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Total T: 78940 Episode Num: 2061 Episode T: 11 Reward: 9.000
recent Evaluation: -3.4100000000000206
Total T: 79006 Episode Num: 2062 Episode T: 66 Reward: -6.600
Total T: 79072 Episode Num: 2063 Episode T: 66 Reward: -6.600
Total T: 79094 Episode Num: 2064 Episode T: 22 Reward: 7.900
Total T: 79103 Episode Num: 2065 Episode T: 9 Reward: 9.200
Total T: 79115 Episode Num: 2066 Episode T: 12 Reward: 8.900
Total T: 79148 Episode Num: 2067 Episode T: 33 Reward: 6.800
Total T: 79160 Episode Num: 2068 Episode T: 12 Reward: 8.900
Total T: 79178 Episode Num: 2069 Episode T: 18 Reward: 8.300
Total T: 79194 Episode Num: 2070 Episode T: 16 Reward: 8.500
Total T: 79204 Episode Num: 2071 Episode T: 10 Reward: 9.100
Total T: 79214 Episode Num: 2072 Episode T: 10 Reward: 9.100
Total T: 79229 Episode Num: 2073 Episode T: 15 Reward: 8.600
Total T: 79248 Episode Num: 2074 Episode T: 19 Reward: 8.200
Total T: 79263 Episode Num: 2075 Episode T: 15 Reward: 8.600
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Total T: 79358 Episode Num: 2077 Episode T: 29 Reward: 7.200
Total T: 79424 Episode Num: 2078 Episode T: 66 Reward: -6.600
Total T: 79490 Episode Num: 2079 Episode T: 66 Reward: -6.600
Total T: 79497 Episode Num: 2080 Episode T: 7 Reward: 9.400
Total T: 79563 Episode Num: 2081 Episode T: 66 Reward: -6.600
Total T: 79581 Episode Num: 2082 Episode T: 18 Reward: 8.300
Total T: 79639 Episode Num: 2083 Episode T: 58 Reward: 4.300
Total T: 79705 Episode Num: 2084 Episode T: 66 Reward: -6.600
Total T: 79770 Episode Num: 2085 Episode T: 65 Reward: 3.600
Total T: 79836 Episode Num: 2086 Episode T: 66 Reward: -6.600
Total T: 79867 Episode Num: 2087 Episode T: 31 Reward: 7.000
Total T: 79933 Episode Num: 2088 Episode T: 66 Reward: -6.600
Total T: 79936 Episode Num: 2089 Episode T: 3 Reward: 9.800
Total T: 79949 Episode Num: 2090 Episode T: 13 Reward: 8.800
Total T: 79966 Episode Num: 2091 Episode T: 17 Reward: 8.400
Total T: 79995 Episode Num: 2092 Episode T: 29 Reward: 7.200
recent Evaluation: 7.990000000000011
Total T: 80010 Episode Num: 2093 Episode T: 15 Reward: 8.600
Total T: 80053 Episode Num: 2094 Episode T: 43 Reward: 5.800
Total T: 80072 Episode Num: 2095 Episode T: 19 Reward: 8.200
Total T: 80083 Episode Num: 2096 Episode T: 11 Reward: 9.000
Total T: 80101 Episode Num: 2097 Episode T: 18 Reward: 8.300
Total T: 80126 Episode Num: 2098 Episode T: 25 Reward: 7.600
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Total T: 80187 Episode Num: 2100 Episode T: 17 Reward: 8.400
Total T: 80228 Episode Num: 2101 Episode T: 41 Reward: 6.000
Total T: 80243 Episode Num: 2102 Episode T: 15 Reward: 8.600
Total T: 80257 Episode Num: 2103 Episode T: 14 Reward: 8.700
Total T: 80273 Episode Num: 2104 Episode T: 16 Reward: 8.500
Total T: 80293 Episode Num: 2105 Episode T: 20 Reward: 8.100
Total T: 80305 Episode Num: 2106 Episode T: 12 Reward: 8.900
Total T: 80324 Episode Num: 2107 Episode T: 19 Reward: 8.200
Total T: 80343 Episode Num: 2108 Episode T: 19 Reward: 8.200
Total T: 80350 Episode Num: 2109 Episode T: 7 Reward: 9.400
Total T: 80357 Episode Num: 2110 Episode T: 7 Reward: 9.400
Total T: 80423 Episode Num: 2111 Episode T: 66 Reward: -6.600
Total T: 80442 Episode Num: 2112 Episode T: 19 Reward: 8.200
Total T: 80451 Episode Num: 2113 Episode T: 9 Reward: 9.200
Total T: 80491 Episode Num: 2114 Episode T: 40 Reward: 6.100
Total T: 80505 Episode Num: 2115 Episode T: 14 Reward: 8.700
Total T: 80518 Episode Num: 2116 Episode T: 13 Reward: 8.800
Total T: 80527 Episode Num: 2117 Episode T: 9 Reward: 9.200
Total T: 80547 Episode Num: 2118 Episode T: 20 Reward: 8.100
Total T: 80563 Episode Num: 2119 Episode T: 16 Reward: 8.500
Total T: 80595 Episode Num: 2120 Episode T: 32 Reward: 6.900
Total T: 80609 Episode Num: 2121 Episode T: 14 Reward: 8.700
Total T: 80621 Episode Num: 2122 Episode T: 12 Reward: 8.900
Total T: 80634 Episode Num: 2123 Episode T: 13 Reward: 8.800
Total T: 80641 Episode Num: 2124 Episode T: 7 Reward: 9.400
Total T: 80669 Episode Num: 2125 Episode T: 28 Reward: 7.300
Total T: 80678 Episode Num: 2126 Episode T: 9 Reward: 9.200
Total T: 80696 Episode Num: 2127 Episode T: 18 Reward: 8.300
Total T: 80743 Episode Num: 2128 Episode T: 47 Reward: 5.400
Total T: 80745 Episode Num: 2129 Episode T: 2 Reward: 9.900
Total T: 80756 Episode Num: 2130 Episode T: 11 Reward: 9.000
Total T: 80769 Episode Num: 2131 Episode T: 13 Reward: 8.800
Total T: 80777 Episode Num: 2132 Episode T: 8 Reward: 9.300
Total T: 80787 Episode Num: 2133 Episode T: 10 Reward: 9.100
Total T: 80792 Episode Num: 2134 Episode T: 5 Reward: 9.600
Total T: 80815 Episode Num: 2135 Episode T: 23 Reward: 7.800
Total T: 80834 Episode Num: 2136 Episode T: 19 Reward: 8.200
Total T: 80881 Episode Num: 2137 Episode T: 47 Reward: 5.400
Total T: 80903 Episode Num: 2138 Episode T: 22 Reward: 7.900
Total T: 80914 Episode Num: 2139 Episode T: 11 Reward: 9.000
Total T: 80922 Episode Num: 2140 Episode T: 8 Reward: 9.300
Total T: 80931 Episode Num: 2141 Episode T: 9 Reward: 9.200
Total T: 80963 Episode Num: 2142 Episode T: 32 Reward: 6.900
Total T: 80978 Episode Num: 2143 Episode T: 15 Reward: 8.600
recent Evaluation: -0.5299999999999928
Total T: 81019 Episode Num: 2144 Episode T: 41 Reward: 6.000
Total T: 81056 Episode Num: 2145 Episode T: 37 Reward: 6.400
Total T: 81089 Episode Num: 2146 Episode T: 33 Reward: 6.800
Total T: 81090 Episode Num: 2147 Episode T: 1 Reward: 10.000
Total T: 81141 Episode Num: 2148 Episode T: 51 Reward: 5.000
Total T: 81151 Episode Num: 2149 Episode T: 10 Reward: 9.100
Total T: 81152 Episode Num: 2150 Episode T: 1 Reward: 10.000
Total T: 81206 Episode Num: 2151 Episode T: 54 Reward: 4.700
Total T: 81226 Episode Num: 2152 Episode T: 20 Reward: 8.100
Total T: 81235 Episode Num: 2153 Episode T: 9 Reward: 9.200
Total T: 81253 Episode Num: 2154 Episode T: 18 Reward: 8.300
Total T: 81258 Episode Num: 2155 Episode T: 5 Reward: 9.600
Total T: 81264 Episode Num: 2156 Episode T: 6 Reward: 9.500
Total T: 81276 Episode Num: 2157 Episode T: 12 Reward: 8.900
Total T: 81294 Episode Num: 2158 Episode T: 18 Reward: 8.300
Total T: 81313 Episode Num: 2159 Episode T: 19 Reward: 8.200

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Total T: 81324 Episode Num: 2160 Episode T: 11 Reward: 9.000
Total T: 81347 Episode Num: 2161 Episode T: 23 Reward: 7.800
Total T: 81359 Episode Num: 2162 Episode T: 12 Reward: 8.900
Total T: 81383 Episode Num: 2163 Episode T: 24 Reward: 7.700
Total T: 81449 Episode Num: 2164 Episode T: 66 Reward: -6.600
Total T: 81469 Episode Num: 2165 Episode T: 20 Reward: 8.100
Total T: 81479 Episode Num: 2166 Episode T: 10 Reward: 9.100
Total T: 81491 Episode Num: 2167 Episode T: 12 Reward: 8.900
Total T: 81512 Episode Num: 2168 Episode T: 21 Reward: 8.000
Total T: 81526 Episode Num: 2169 Episode T: 14 Reward: 8.700
Total T: 81536 Episode Num: 2170 Episode T: 10 Reward: 9.100
Total T: 81545 Episode Num: 2171 Episode T: 9 Reward: 9.200
Total T: 81557 Episode Num: 2172 Episode T: 12 Reward: 8.900
Total T: 81569 Episode Num: 2173 Episode T: 12 Reward: 8.900
Total T: 81584 Episode Num: 2174 Episode T: 15 Reward: 8.600
Total T: 81604 Episode Num: 2175 Episode T: 20 Reward: 8.100
Total T: 81622 Episode Num: 2176 Episode T: 18 Reward: 8.300
Total T: 81639 Episode Num: 2177 Episode T: 17 Reward: 8.400
Total T: 81653 Episode Num: 2178 Episode T: 14 Reward: 8.700
Total T: 81679 Episode Num: 2179 Episode T: 26 Reward: 7.500
Total T: 81699 Episode Num: 2180 Episode T: 20 Reward: 8.100
Total T: 81741 Episode Num: 2181 Episode T: 42 Reward: 5.900
Total T: 81758 Episode Num: 2182 Episode T: 17 Reward: 8.400
Total T: 81789 Episode Num: 2183 Episode T: 31 Reward: 7.000
Total T: 81804 Episode Num: 2184 Episode T: 15 Reward: 8.600
Total T: 81819 Episode Num: 2185 Episode T: 15 Reward: 8.600
Total T: 81825 Episode Num: 2186 Episode T: 6 Reward: 9.500
Total T: 81852 Episode Num: 2187 Episode T: 27 Reward: 7.400
Total T: 81875 Episode Num: 2188 Episode T: 23 Reward: 7.800
Total T: 81894 Episode Num: 2189 Episode T: 19 Reward: 8.200
Total T: 81908 Episode Num: 2190 Episode T: 14 Reward: 8.700
Total T: 81947 Episode Num: 2191 Episode T: 39 Reward: 6.200
Total T: 81961 Episode Num: 2192 Episode T: 14 Reward: 8.700
Total T: 81995 Episode Num: 2193 Episode T: 34 Reward: 6.700
recent Evaluation: -0.989999999999992
Total T: 82061 Episode Num: 2194 Episode T: 66 Reward: -6.600
Total T: 82084 Episode Num: 2195 Episode T: 23 Reward: 7.800
Total T: 82129 Episode Num: 2196 Episode T: 45 Reward: 5.600
Total T: 82150 Episode Num: 2197 Episode T: 21 Reward: 8.000
Total T: 82175 Episode Num: 2198 Episode T: 25 Reward: 7.600
Total T: 82198 Episode Num: 2199 Episode T: 23 Reward: 7.800
Total T: 82217 Episode Num: 2200 Episode T: 19 Reward: 8.200
Total T: 82239 Episode Num: 2201 Episode T: 22 Reward: 7.900
Total T: 82254 Episode Num: 2202 Episode T: 15 Reward: 8.600
Total T: 82268 Episode Num: 2203 Episode T: 14 Reward: 8.700
Total T: 82276 Episode Num: 2204 Episode T: 8 Reward: 9.300
Total T: 82295 Episode Num: 2205 Episode T: 19 Reward: 8.200
Total T: 82305 Episode Num: 2206 Episode T: 10 Reward: 9.100
Total T: 82311 Episode Num: 2207 Episode T: 6 Reward: 9.500
Total T: 82326 Episode Num: 2208 Episode T: 15 Reward: 8.600
Total T: 82353 Episode Num: 2209 Episode T: 27 Reward: 7.400
Total T: 82371 Episode Num: 2210 Episode T: 18 Reward: 8.300
Total T: 82380 Episode Num: 2211 Episode T: 9 Reward: 9.200
Total T: 82405 Episode Num: 2212 Episode T: 25 Reward: 7.600
Total T: 82442 Episode Num: 2213 Episode T: 37 Reward: 6.400
Total T: 82464 Episode Num: 2214 Episode T: 22 Reward: 7.900
Total T: 82485 Episode Num: 2215 Episode T: 21 Reward: 8.000
Total T: 82493 Episode Num: 2216 Episode T: 8 Reward: 9.300
Total T: 82503 Episode Num: 2217 Episode T: 10 Reward: 9.100
Total T: 82525 Episode Num: 2218 Episode T: 22 Reward: 7.900
Total T: 82550 Episode Num: 2219 Episode T: 25 Reward: 7.600
Total T: 82593 Episode Num: 2220 Episode T: 43 Reward: 5.800
Total T: 82609 Episode Num: 2221 Episode T: 16 Reward: 8.500
Total T: 82623 Episode Num: 2222 Episode T: 14 Reward: 8.700
Total T: 82651 Episode Num: 2223 Episode T: 28 Reward: 7.300
Total T: 82668 Episode Num: 2224 Episode T: 17 Reward: 8.400
Total T: 82708 Episode Num: 2225 Episode T: 40 Reward: 6.100
Total T: 82728 Episode Num: 2226 Episode T: 20 Reward: 8.100
Total T: 82737 Episode Num: 2227 Episode T: 9 Reward: 9.200
Total T: 82801 Episode Num: 2228 Episode T: 64 Reward: 3.700
Total T: 82811 Episode Num: 2229 Episode T: 10 Reward: 9.100
Total T: 82822 Episode Num: 2230 Episode T: 11 Reward: 9.000
Total T: 82849 Episode Num: 2231 Episode T: 27 Reward: 7.400
Total T: 82883 Episode Num: 2232 Episode T: 34 Reward: 6.700
Total T: 82894 Episode Num: 2233 Episode T: 11 Reward: 9.000
Total T: 82923 Episode Num: 2234 Episode T: 29 Reward: 7.200
Total T: 82938 Episode Num: 2235 Episode T: 15 Reward: 8.600
Total T: 82955 Episode Num: 2236 Episode T: 17 Reward: 8.400
Total T: 82965 Episode Num: 2237 Episode T: 10 Reward: 9.100
Total T: 83000 Episode Num: 2238 Episode T: 35 Reward: 6.600
recent Evaluation: 0.4800000000000056
Total T: 83037 Episode Num: 2239 Episode T: 37 Reward: 6.400
Total T: 83048 Episode Num: 2240 Episode T: 11 Reward: 9.000
Total T: 83055 Episode Num: 2241 Episode T: 7 Reward: 9.400
Total T: 83078 Episode Num: 2242 Episode T: 23 Reward: 7.800
Total T: 83093 Episode Num: 2243 Episode T: 15 Reward: 8.600
Total T: 83105 Episode Num: 2244 Episode T: 12 Reward: 8.900
Total T: 83140 Episode Num: 2245 Episode T: 35 Reward: 6.600
Total T: 83152 Episode Num: 2246 Episode T: 12 Reward: 8.900
Total T: 83189 Episode Num: 2247 Episode T: 37 Reward: 6.400
Total T: 83209 Episode Num: 2248 Episode T: 20 Reward: 8.100
Total T: 83227 Episode Num: 2249 Episode T: 18 Reward: 8.300
Total T: 83232 Episode Num: 2250 Episode T: 5 Reward: 9.600
Total T: 83247 Episode Num: 2251 Episode T: 15 Reward: 8.600
Total T: 83258 Episode Num: 2252 Episode T: 11 Reward: 9.000
Total T: 83324 Episode Num: 2253 Episode T: 66 Reward: -6.600
Total T: 83341 Episode Num: 2254 Episode T: 17 Reward: 8.400
Total T: 83357 Episode Num: 2255 Episode T: 16 Reward: 8.500
Total T: 83361 Episode Num: 2256 Episode T: 4 Reward: 9.700
Total T: 83370 Episode Num: 2257 Episode T: 9 Reward: 9.200
Total T: 83376 Episode Num: 2258 Episode T: 6 Reward: 9.500
Total T: 83384 Episode Num: 2259 Episode T: 8 Reward: 9.300
Total T: 83413 Episode Num: 2260 Episode T: 29 Reward: 7.200
Total T: 83420 Episode Num: 2261 Episode T: 7 Reward: 9.400
Total T: 83441 Episode Num: 2262 Episode T: 21 Reward: 8.000
Total T: 83455 Episode Num: 2263 Episode T: 14 Reward: 8.700
Total T: 83465 Episode Num: 2264 Episode T: 10 Reward: 9.100
Total T: 83477 Episode Num: 2265 Episode T: 12 Reward: 8.900
Total T: 83490 Episode Num: 2266 Episode T: 13 Reward: 8.800
Total T: 83501 Episode Num: 2267 Episode T: 11 Reward: 9.000
Total T: 83550 Episode Num: 2268 Episode T: 49 Reward: 5.200
Total T: 83581 Episode Num: 2269 Episode T: 31 Reward: 7.000
Total T: 83615 Episode Num: 2270 Episode T: 34 Reward: 6.700
Total T: 83636 Episode Num: 2271 Episode T: 21 Reward: 8.000
Total T: 83648 Episode Num: 2272 Episode T: 12 Reward: 8.900
Total T: 83667 Episode Num: 2273 Episode T: 19 Reward: 8.200

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Total T: 83696 Episode Num: 2274 Episode T: 29 Reward: 7.200
Total T: 83705 Episode Num: 2275 Episode T: 9 Reward: 9.200
Total T: 83723 Episode Num: 2276 Episode T: 18 Reward: 8.300
Total T: 83742 Episode Num: 2277 Episode T: 19 Reward: 8.200
Total T: 83758 Episode Num: 2278 Episode T: 16 Reward: 8.500
Total T: 83798 Episode Num: 2279 Episode T: 40 Reward: 6.100
Total T: 83803 Episode Num: 2280 Episode T: 5 Reward: 9.600
Total T: 83820 Episode Num: 2281 Episode T: 17 Reward: 8.400
Total T: 83837 Episode Num: 2282 Episode T: 17 Reward: 8.400
Total T: 83858 Episode Num: 2283 Episode T: 21 Reward: 8.000
Total T: 83882 Episode Num: 2284 Episode T: 24 Reward: 7.700
Total T: 83910 Episode Num: 2285 Episode T: 28 Reward: 7.300
Total T: 83930 Episode Num: 2286 Episode T: 20 Reward: 8.100
Total T: 83941 Episode Num: 2287 Episode T: 11 Reward: 9.000
recent Evaluation: 2.460000000000035
Total T: 84007 Episode Num: 2288 Episode T: 66 Reward: -6.600
Total T: 84040 Episode Num: 2289 Episode T: 33 Reward: 6.800
Total T: 84054 Episode Num: 2290 Episode T: 14 Reward: 8.700
Total T: 84075 Episode Num: 2291 Episode T: 21 Reward: 8.000
Total T: 84088 Episode Num: 2292 Episode T: 13 Reward: 8.800
Total T: 84101 Episode Num: 2293 Episode T: 13 Reward: 8.800
Total T: 84120 Episode Num: 2294 Episode T: 19 Reward: 8.200
Total T: 84126 Episode Num: 2295 Episode T: 6 Reward: 9.500
Total T: 84142 Episode Num: 2296 Episode T: 16 Reward: 8.500
Total T: 84153 Episode Num: 2297 Episode T: 11 Reward: 9.000
Total T: 84176 Episode Num: 2298 Episode T: 23 Reward: 7.800
Total T: 84186 Episode Num: 2299 Episode T: 10 Reward: 9.100
Total T: 84222 Episode Num: 2300 Episode T: 36 Reward: 6.500
Total T: 84235 Episode Num: 2301 Episode T: 13 Reward: 8.800
Total T: 84255 Episode Num: 2302 Episode T: 20 Reward: 8.100
Total T: 84269 Episode Num: 2303 Episode T: 14 Reward: 8.700
Total T: 84283 Episode Num: 2304 Episode T: 14 Reward: 8.700
Total T: 84292 Episode Num: 2305 Episode T: 9 Reward: 9.200
Total T: 84327 Episode Num: 2306 Episode T: 35 Reward: 6.600
Total T: 84348 Episode Num: 2307 Episode T: 21 Reward: 8.000
Total T: 84379 Episode Num: 2308 Episode T: 31 Reward: 7.000
Total T: 84396 Episode Num: 2309 Episode T: 17 Reward: 8.400
Total T: 84418 Episode Num: 2310 Episode T: 22 Reward: 7.900
Total T: 84452 Episode Num: 2311 Episode T: 34 Reward: 6.700
Total T: 84472 Episode Num: 2312 Episode T: 20 Reward: 8.100
Total T: 84508 Episode Num: 2313 Episode T: 36 Reward: 6.500
Total T: 84528 Episode Num: 2314 Episode T: 20 Reward: 8.100
Total T: 84541 Episode Num: 2315 Episode T: 13 Reward: 8.800
Total T: 84550 Episode Num: 2316 Episode T: 9 Reward: 9.200
Total T: 84569 Episode Num: 2317 Episode T: 19 Reward: 8.200
Total T: 84610 Episode Num: 2318 Episode T: 41 Reward: 6.000
Total T: 84635 Episode Num: 2319 Episode T: 25 Reward: 7.600
Total T: 84648 Episode Num: 2320 Episode T: 13 Reward: 8.800
Total T: 84669 Episode Num: 2321 Episode T: 21 Reward: 8.000
Total T: 84691 Episode Num: 2322 Episode T: 22 Reward: 7.900
Total T: 84703 Episode Num: 2323 Episode T: 12 Reward: 8.900
Total T: 84707 Episode Num: 2324 Episode T: 4 Reward: 9.700
Total T: 84720 Episode Num: 2325 Episode T: 13 Reward: 8.800
Total T: 84746 Episode Num: 2326 Episode T: 26 Reward: 7.500
Total T: 84795 Episode Num: 2327 Episode T: 49 Reward: 5.200
Total T: 84831 Episode Num: 2328 Episode T: 36 Reward: 6.500
Total T: 84850 Episode Num: 2329 Episode T: 19 Reward: 8.200
Total T: 84881 Episode Num: 2330 Episode T: 31 Reward: 7.000
Total T: 84894 Episode Num: 2331 Episode T: 13 Reward: 8.800
Total T: 84920 Episode Num: 2332 Episode T: 26 Reward: 7.500
Total T: 84950 Episode Num: 2333 Episode T: 30 Reward: 7.100
Total T: 84963 Episode Num: 2334 Episode T: 13 Reward: 8.800
Total T: 84978 Episode Num: 2335 Episode T: 15 Reward: 8.600
Total T: 84990 Episode Num: 2336 Episode T: 12 Reward: 8.900
recent Evaluation: 8.310000000000018
Total T: 85028 Episode Num: 2337 Episode T: 38 Reward: 6.300
Total T: 85062 Episode Num: 2338 Episode T: 34 Reward: 6.700
Total T: 85080 Episode Num: 2339 Episode T: 18 Reward: 8.300
Total T: 85093 Episode Num: 2340 Episode T: 13 Reward: 8.800
Total T: 85115 Episode Num: 2341 Episode T: 22 Reward: 7.900
Total T: 85151 Episode Num: 2342 Episode T: 36 Reward: 6.500
Total T: 85182 Episode Num: 2343 Episode T: 31 Reward: 7.000
Total T: 85191 Episode Num: 2344 Episode T: 9 Reward: 9.200
Total T: 85231 Episode Num: 2345 Episode T: 40 Reward: 6.100
Total T: 85234 Episode Num: 2346 Episode T: 3 Reward: 9.800
Total T: 85263 Episode Num: 2347 Episode T: 29 Reward: 7.200
Total T: 85269 Episode Num: 2348 Episode T: 6 Reward: 9.500
Total T: 85282 Episode Num: 2349 Episode T: 13 Reward: 8.800
Total T: 85292 Episode Num: 2350 Episode T: 10 Reward: 9.100
Total T: 85302 Episode Num: 2351 Episode T: 10 Reward: 9.100
Total T: 85319 Episode Num: 2352 Episode T: 17 Reward: 8.400
Total T: 85335 Episode Num: 2353 Episode T: 16 Reward: 8.500
Total T: 85357 Episode Num: 2354 Episode T: 22 Reward: 7.900
Total T: 85381 Episode Num: 2355 Episode T: 24 Reward: 7.700
Total T: 85394 Episode Num: 2356 Episode T: 13 Reward: 8.800
Total T: 85418 Episode Num: 2357 Episode T: 24 Reward: 7.700
Total T: 85430 Episode Num: 2358 Episode T: 12 Reward: 8.900
Total T: 85443 Episode Num: 2359 Episode T: 13 Reward: 8.800
Total T: 85449 Episode Num: 2360 Episode T: 6 Reward: 9.500
Total T: 85464 Episode Num: 2361 Episode T: 15 Reward: 8.600
Total T: 85476 Episode Num: 2362 Episode T: 12 Reward: 8.900
Total T: 85519 Episode Num: 2363 Episode T: 43 Reward: 5.800
Total T: 85532 Episode Num: 2364 Episode T: 13 Reward: 8.800
Total T: 85542 Episode Num: 2365 Episode T: 10 Reward: 9.100
Total T: 85548 Episode Num: 2366 Episode T: 6 Reward: 9.500
Total T: 85567 Episode Num: 2367 Episode T: 19 Reward: 8.200
Total T: 85571 Episode Num: 2368 Episode T: 4 Reward: 9.700
Total T: 85599 Episode Num: 2369 Episode T: 28 Reward: 7.300
Total T: 85608 Episode Num: 2370 Episode T: 9 Reward: 9.200
Total T: 85625 Episode Num: 2371 Episode T: 17 Reward: 8.400
Total T: 85671 Episode Num: 2372 Episode T: 46 Reward: 5.500
Total T: 85675 Episode Num: 2373 Episode T: 4 Reward: 9.700
Total T: 85689 Episode Num: 2374 Episode T: 14 Reward: 8.700
Total T: 85726 Episode Num: 2375 Episode T: 37 Reward: 6.400
Total T: 85747 Episode Num: 2376 Episode T: 21 Reward: 8.000
Total T: 85752 Episode Num: 2377 Episode T: 5 Reward: 9.600
Total T: 85762 Episode Num: 2378 Episode T: 10 Reward: 9.100
Total T: 85775 Episode Num: 2379 Episode T: 13 Reward: 8.800
Total T: 85815 Episode Num: 2380 Episode T: 40 Reward: 6.100
Total T: 85835 Episode Num: 2381 Episode T: 20 Reward: 8.100
Total T: 85840 Episode Num: 2382 Episode T: 5 Reward: 9.600
Total T: 85873 Episode Num: 2383 Episode T: 33 Reward: 6.800
Total T: 85888 Episode Num: 2384 Episode T: 15 Reward: 8.600
Total T: 85914 Episode Num: 2385 Episode T: 26 Reward: 7.500
Total T: 85922 Episode Num: 2386 Episode T: 8 Reward: 9.300
Total T: 85929 Episode Num: 2387 Episode T: 7 Reward: 9.400

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Total T: 85953 Episode Num: 2388 Episode T: 24 Reward: 7.700
Total T: 85970 Episode Num: 2389 Episode T: 17 Reward: 8.400
Total T: 85981 Episode Num: 2390 Episode T: 11 Reward: 9.000
Total T: 85992 Episode Num: 2391 Episode T: 11 Reward: 9.000
recent Evaluation: 7.279999999999992
Total T: 86029 Episode Num: 2392 Episode T: 37 Reward: 6.400
Total T: 86047 Episode Num: 2393 Episode T: 18 Reward: 8.300
Total T: 86059 Episode Num: 2394 Episode T: 12 Reward: 8.900
Total T: 86090 Episode Num: 2395 Episode T: 31 Reward: 7.000
Total T: 86110 Episode Num: 2396 Episode T: 20 Reward: 8.100
Total T: 86123 Episode Num: 2397 Episode T: 13 Reward: 8.800
Total T: 86166 Episode Num: 2398 Episode T: 43 Reward: 5.800
Total T: 86191 Episode Num: 2399 Episode T: 25 Reward: 7.600
Total T: 86198 Episode Num: 2400 Episode T: 7 Reward: 9.400
Total T: 86227 Episode Num: 2401 Episode T: 29 Reward: 7.200
Total T: 86238 Episode Num: 2402 Episode T: 11 Reward: 9.000
Total T: 86250 Episode Num: 2403 Episode T: 12 Reward: 8.900
Total T: 86278 Episode Num: 2404 Episode T: 28 Reward: 7.300
Total T: 86295 Episode Num: 2405 Episode T: 17 Reward: 8.400
Total T: 86312 Episode Num: 2406 Episode T: 17 Reward: 8.400
Total T: 86327 Episode Num: 2407 Episode T: 15 Reward: 8.600
Total T: 86347 Episode Num: 2408 Episode T: 20 Reward: 8.100
Total T: 86366 Episode Num: 2409 Episode T: 19 Reward: 8.200
Total T: 86380 Episode Num: 2410 Episode T: 14 Reward: 8.700
Total T: 86403 Episode Num: 2411 Episode T: 23 Reward: 7.800
Total T: 86413 Episode Num: 2412 Episode T: 10 Reward: 9.100
Total T: 86466 Episode Num: 2413 Episode T: 53 Reward: 4.800
Total T: 86495 Episode Num: 2414 Episode T: 29 Reward: 7.200
Total T: 86514 Episode Num: 2415 Episode T: 19 Reward: 8.200
Total T: 86547 Episode Num: 2416 Episode T: 33 Reward: 6.800
Total T: 86569 Episode Num: 2417 Episode T: 22 Reward: 7.900
Total T: 86577 Episode Num: 2418 Episode T: 8 Reward: 9.300
Total T: 86591 Episode Num: 2419 Episode T: 14 Reward: 8.700
Total T: 86604 Episode Num: 2420 Episode T: 13 Reward: 8.800
Total T: 86633 Episode Num: 2421 Episode T: 29 Reward: 7.200
Total T: 86670 Episode Num: 2422 Episode T: 37 Reward: 6.400
Total T: 86687 Episode Num: 2423 Episode T: 17 Reward: 8.400
Total T: 86699 Episode Num: 2424 Episode T: 12 Reward: 8.900
Total T: 86735 Episode Num: 2425 Episode T: 36 Reward: 6.500
Total T: 86752 Episode Num: 2426 Episode T: 17 Reward: 8.400
Total T: 86760 Episode Num: 2427 Episode T: 8 Reward: 9.300
Total T: 86775 Episode Num: 2428 Episode T: 15 Reward: 8.600
Total T: 86790 Episode Num: 2429 Episode T: 15 Reward: 8.600
Total T: 86812 Episode Num: 2430 Episode T: 22 Reward: 7.900
Total T: 86827 Episode Num: 2431 Episode T: 15 Reward: 8.600
Total T: 86842 Episode Num: 2432 Episode T: 15 Reward: 8.600
Total T: 86860 Episode Num: 2433 Episode T: 18 Reward: 8.300
Total T: 86864 Episode Num: 2434 Episode T: 4 Reward: 9.700
Total T: 86882 Episode Num: 2435 Episode T: 18 Reward: 8.300
Total T: 86892 Episode Num: 2436 Episode T: 10 Reward: 9.100
Total T: 86908 Episode Num: 2437 Episode T: 16 Reward: 8.500
Total T: 86927 Episode Num: 2438 Episode T: 19 Reward: 8.200
Total T: 86935 Episode Num: 2439 Episode T: 8 Reward: 9.300
Total T: 86953 Episode Num: 2440 Episode T: 18 Reward: 8.300
Total T: 86962 Episode Num: 2441 Episode T: 9 Reward: 9.200
Total T: 86981 Episode Num: 2442 Episode T: 19 Reward: 8.200
Total T: 86999 Episode Num: 2443 Episode T: 18 Reward: 8.300
recent Evaluation: 8.800000000000002
Total T: 87006 Episode Num: 2444 Episode T: 7 Reward: 9.400
Total T: 87014 Episode Num: 2445 Episode T: 8 Reward: 9.300
Total T: 87023 Episode Num: 2446 Episode T: 9 Reward: 9.200
Total T: 87025 Episode Num: 2447 Episode T: 2 Reward: 9.900
Total T: 87039 Episode Num: 2448 Episode T: 14 Reward: 8.700
Total T: 87044 Episode Num: 2449 Episode T: 5 Reward: 9.600
Total T: 87090 Episode Num: 2450 Episode T: 46 Reward: 5.500
Total T: 87110 Episode Num: 2451 Episode T: 20 Reward: 8.100
Total T: 87119 Episode Num: 2452 Episode T: 9 Reward: 9.200
Total T: 87120 Episode Num: 2453 Episode T: 1 Reward: 10.000
Total T: 87162 Episode Num: 2454 Episode T: 42 Reward: 5.900
Total T: 87167 Episode Num: 2455 Episode T: 5 Reward: 9.600
Total T: 87189 Episode Num: 2456 Episode T: 22 Reward: 7.900
Total T: 87227 Episode Num: 2457 Episode T: 38 Reward: 6.300
Total T: 87242 Episode Num: 2458 Episode T: 15 Reward: 8.600
Total T: 87259 Episode Num: 2459 Episode T: 17 Reward: 8.400
Total T: 87268 Episode Num: 2460 Episode T: 9 Reward: 9.200
Total T: 87288 Episode Num: 2461 Episode T: 20 Reward: 8.100
Total T: 87300 Episode Num: 2462 Episode T: 12 Reward: 8.900
Total T: 87313 Episode Num: 2463 Episode T: 13 Reward: 8.800
Total T: 87322 Episode Num: 2464 Episode T: 9 Reward: 9.200
Total T: 87333 Episode Num: 2465 Episode T: 11 Reward: 9.000
Total T: 87358 Episode Num: 2466 Episode T: 25 Reward: 7.600
Total T: 87363 Episode Num: 2467 Episode T: 5 Reward: 9.600
Total T: 87377 Episode Num: 2468 Episode T: 14 Reward: 8.700
Total T: 87386 Episode Num: 2469 Episode T: 9 Reward: 9.200
Total T: 87399 Episode Num: 2470 Episode T: 13 Reward: 8.800
Total T: 87423 Episode Num: 2471 Episode T: 24 Reward: 7.700
Total T: 87437 Episode Num: 2472 Episode T: 14 Reward: 8.700
Total T: 87448 Episode Num: 2473 Episode T: 11 Reward: 9.000
Total T: 87459 Episode Num: 2474 Episode T: 11 Reward: 9.000
Total T: 87525 Episode Num: 2475 Episode T: 66 Reward: -6.600
Total T: 87534 Episode Num: 2476 Episode T: 9 Reward: 9.200
Total T: 87600 Episode Num: 2477 Episode T: 66 Reward: -6.600
Total T: 87618 Episode Num: 2478 Episode T: 18 Reward: 8.300
Total T: 87664 Episode Num: 2479 Episode T: 46 Reward: 5.500
Total T: 87681 Episode Num: 2480 Episode T: 17 Reward: 8.400
Total T: 87695 Episode Num: 2481 Episode T: 14 Reward: 8.700
Total T: 87710 Episode Num: 2482 Episode T: 15 Reward: 8.600
Total T: 87718 Episode Num: 2483 Episode T: 8 Reward: 9.300
Total T: 87729 Episode Num: 2484 Episode T: 11 Reward: 9.000
Total T: 87737 Episode Num: 2485 Episode T: 8 Reward: 9.300
Total T: 87742 Episode Num: 2486 Episode T: 5 Reward: 9.600
Total T: 87756 Episode Num: 2487 Episode T: 14 Reward: 8.700
Total T: 87766 Episode Num: 2488 Episode T: 10 Reward: 9.100
Total T: 87774 Episode Num: 2489 Episode T: 8 Reward: 9.300
Total T: 87784 Episode Num: 2490 Episode T: 10 Reward: 9.100
Total T: 87802 Episode Num: 2491 Episode T: 18 Reward: 8.300
Total T: 87849 Episode Num: 2492 Episode T: 47 Reward: 5.400
Total T: 87856 Episode Num: 2493 Episode T: 7 Reward: 9.400
Total T: 87885 Episode Num: 2494 Episode T: 29 Reward: 7.200
Total T: 87900 Episode Num: 2495 Episode T: 15 Reward: 8.600
Total T: 87915 Episode Num: 2496 Episode T: 15 Reward: 8.600
Total T: 87930 Episode Num: 2497 Episode T: 15 Reward: 8.600
Total T: 87961 Episode Num: 2498 Episode T: 31 Reward: 7.000
Total T: 87974 Episode Num: 2499 Episode T: 13 Reward: 8.800
Total T: 87992 Episode Num: 2500 Episode T: 18 Reward: 8.300
Total T: 87999 Episode Num: 2501 Episode T: 7 Reward: 9.400

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recent Evaluation: 8.43
Total T: 88017 Episode Num: 2502 Episode T: 18 Reward: 8.300
Total T: 88039 Episode Num: 2503 Episode T: 22 Reward: 7.900
Total T: 88047 Episode Num: 2504 Episode T: 8 Reward: 9.300
Total T: 88082 Episode Num: 2505 Episode T: 35 Reward: 6.600
Total T: 88103 Episode Num: 2506 Episode T: 21 Reward: 8.000
Total T: 88110 Episode Num: 2507 Episode T: 7 Reward: 9.400
Total T: 88125 Episode Num: 2508 Episode T: 15 Reward: 8.600
Total T: 88138 Episode Num: 2509 Episode T: 13 Reward: 8.800
Total T: 88154 Episode Num: 2510 Episode T: 16 Reward: 8.500
Total T: 88158 Episode Num: 2511 Episode T: 4 Reward: 9.700
Total T: 88192 Episode Num: 2512 Episode T: 34 Reward: 6.700
Total T: 88209 Episode Num: 2513 Episode T: 17 Reward: 8.400
Total T: 88211 Episode Num: 2514 Episode T: 2 Reward: 9.900
Total T: 88215 Episode Num: 2515 Episode T: 4 Reward: 9.700
Total T: 88253 Episode Num: 2516 Episode T: 38 Reward: 6.300
Total T: 88256 Episode Num: 2517 Episode T: 3 Reward: 9.800
Total T: 88283 Episode Num: 2518 Episode T: 27 Reward: 7.400
Total T: 88302 Episode Num: 2519 Episode T: 19 Reward: 8.200
Total T: 88315 Episode Num: 2520 Episode T: 13 Reward: 8.800
Total T: 88322 Episode Num: 2521 Episode T: 7 Reward: 9.400
Total T: 88371 Episode Num: 2522 Episode T: 49 Reward: 5.200
Total T: 88393 Episode Num: 2523 Episode T: 22 Reward: 7.900
Total T: 88411 Episode Num: 2524 Episode T: 18 Reward: 8.300
Total T: 88442 Episode Num: 2525 Episode T: 31 Reward: 7.000
Total T: 88508 Episode Num: 2526 Episode T: 66 Reward: -6.600
Total T: 88532 Episode Num: 2527 Episode T: 24 Reward: 7.700
Total T: 88548 Episode Num: 2528 Episode T: 16 Reward: 8.500
Total T: 88566 Episode Num: 2529 Episode T: 18 Reward: 8.300
Total T: 88584 Episode Num: 2530 Episode T: 18 Reward: 8.300
Total T: 88605 Episode Num: 2531 Episode T: 21 Reward: 8.000
Total T: 88613 Episode Num: 2532 Episode T: 8 Reward: 9.300
Total T: 88630 Episode Num: 2533 Episode T: 17 Reward: 8.400
Total T: 88647 Episode Num: 2534 Episode T: 17 Reward: 8.400
Total T: 88655 Episode Num: 2535 Episode T: 8 Reward: 9.300
Total T: 88662 Episode Num: 2536 Episode T: 7 Reward: 9.400
Total T: 88674 Episode Num: 2537 Episode T: 12 Reward: 8.900
Total T: 88691 Episode Num: 2538 Episode T: 17 Reward: 8.400
Total T: 88723 Episode Num: 2539 Episode T: 32 Reward: 6.900
Total T: 88740 Episode Num: 2540 Episode T: 17 Reward: 8.400
Total T: 88757 Episode Num: 2541 Episode T: 17 Reward: 8.400
Total T: 88783 Episode Num: 2542 Episode T: 26 Reward: 7.500
Total T: 88791 Episode Num: 2543 Episode T: 8 Reward: 9.300
Total T: 88801 Episode Num: 2544 Episode T: 10 Reward: 9.100
Total T: 88830 Episode Num: 2545 Episode T: 29 Reward: 7.200
Total T: 88841 Episode Num: 2546 Episode T: 11 Reward: 9.000
Total T: 88859 Episode Num: 2547 Episode T: 18 Reward: 8.300
Total T: 88880 Episode Num: 2548 Episode T: 21 Reward: 8.000
Total T: 88915 Episode Num: 2549 Episode T: 35 Reward: 6.600
Total T: 88922 Episode Num: 2550 Episode T: 7 Reward: 9.400
Total T: 88931 Episode Num: 2551 Episode T: 9 Reward: 9.200
Total T: 88953 Episode Num: 2552 Episode T: 22 Reward: 7.900
Total T: 88961 Episode Num: 2553 Episode T: 8 Reward: 9.300
Total T: 88971 Episode Num: 2554 Episode T: 10 Reward: 9.100
Total T: 88981 Episode Num: 2555 Episode T: 10 Reward: 9.100
Total T: 88999 Episode Num: 2556 Episode T: 18 Reward: 8.300
recent Evaluation: 8.510000000000009
Total T: 89018 Episode Num: 2557 Episode T: 19 Reward: 8.200
Total T: 89022 Episode Num: 2558 Episode T: 4 Reward: 9.700
Total T: 89035 Episode Num: 2559 Episode T: 13 Reward: 8.800
Total T: 89087 Episode Num: 2560 Episode T: 52 Reward: 4.900
Total T: 89117 Episode Num: 2561 Episode T: 30 Reward: 7.100
Total T: 89137 Episode Num: 2562 Episode T: 20 Reward: 8.100
Total T: 89159 Episode Num: 2563 Episode T: 22 Reward: 7.900
Total T: 89172 Episode Num: 2564 Episode T: 13 Reward: 8.800
Total T: 89189 Episode Num: 2565 Episode T: 17 Reward: 8.400
Total T: 89202 Episode Num: 2566 Episode T: 13 Reward: 8.800
Total T: 89215 Episode Num: 2567 Episode T: 13 Reward: 8.800
Total T: 89225 Episode Num: 2568 Episode T: 10 Reward: 9.100
Total T: 89229 Episode Num: 2569 Episode T: 4 Reward: 9.700
Total T: 89235 Episode Num: 2570 Episode T: 6 Reward: 9.500
Total T: 89301 Episode Num: 2571 Episode T: 66 Reward: -6.600
Total T: 89341 Episode Num: 2572 Episode T: 40 Reward: 6.100
Total T: 89347 Episode Num: 2573 Episode T: 6 Reward: 9.500
Total T: 89371 Episode Num: 2574 Episode T: 24 Reward: 7.700
Total T: 89382 Episode Num: 2575 Episode T: 11 Reward: 9.000
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Total T: 89410 Episode Num: 2577 Episode T: 19 Reward: 8.200
Total T: 89420 Episode Num: 2578 Episode T: 10 Reward: 9.100
Total T: 89436 Episode Num: 2579 Episode T: 16 Reward: 8.500
Total T: 89477 Episode Num: 2580 Episode T: 41 Reward: 6.000
Total T: 89497 Episode Num: 2581 Episode T: 20 Reward: 8.100
Total T: 89525 Episode Num: 2582 Episode T: 28 Reward: 7.300
Total T: 89543 Episode Num: 2583 Episode T: 18 Reward: 8.300
Total T: 89554 Episode Num: 2584 Episode T: 11 Reward: 9.000
Total T: 89574 Episode Num: 2585 Episode T: 20 Reward: 8.100
Total T: 89588 Episode Num: 2586 Episode T: 14 Reward: 8.700
Total T: 89593 Episode Num: 2587 Episode T: 5 Reward: 9.600
Total T: 89603 Episode Num: 2588 Episode T: 10 Reward: 9.100
Total T: 89615 Episode Num: 2589 Episode T: 12 Reward: 8.900
Total T: 89639 Episode Num: 2590 Episode T: 24 Reward: 7.700
Total T: 89658 Episode Num: 2591 Episode T: 19 Reward: 8.200
Total T: 89666 Episode Num: 2592 Episode T: 8 Reward: 9.300
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Total T: 89701 Episode Num: 2595 Episode T: 16 Reward: 8.500
Total T: 89721 Episode Num: 2596 Episode T: 20 Reward: 8.100
Total T: 89730 Episode Num: 2597 Episode T: 9 Reward: 9.200
Total T: 89746 Episode Num: 2598 Episode T: 16 Reward: 8.500
Total T: 89773 Episode Num: 2599 Episode T: 27 Reward: 7.400
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Total T: 89845 Episode Num: 2602 Episode T: 14 Reward: 8.700
Total T: 89878 Episode Num: 2603 Episode T: 33 Reward: 6.800
Total T: 89898 Episode Num: 2604 Episode T: 20 Reward: 8.100
Total T: 89903 Episode Num: 2605 Episode T: 5 Reward: 9.600
Total T: 89933 Episode Num: 2606 Episode T: 30 Reward: 7.100
Total T: 89961 Episode Num: 2607 Episode T: 28 Reward: 7.300
Total T: 89982 Episode Num: 2608 Episode T: 21 Reward: 8.000
Total T: 89999 Episode Num: 2609 Episode T: 17 Reward: 8.400
recent Evaluation: 8.02
Total T: 90016 Episode Num: 2610 Episode T: 17 Reward: 8.400
Total T: 90030 Episode Num: 2611 Episode T: 14 Reward: 8.700
Total T: 90046 Episode Num: 2612 Episode T: 16 Reward: 8.500
Total T: 90091 Episode Num: 2613 Episode T: 45 Reward: 5.600
Total T: 90107 Episode Num: 2614 Episode T: 16 Reward: 8.500

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Total T: 90121 Episode Num: 2615 Episode T: 14 Reward: 8.700  
Total T: 90134 Episode Num: 2616 Episode T: 13 Reward: 8.800  
Total T: 90155 Episode Num: 2617 Episode T: 21 Reward: 8.000  
Total T: 90163 Episode Num: 2618 Episode T: 8 Reward: 9.300  
Total T: 90187 Episode Num: 2619 Episode T: 24 Reward: 7.700  
Total T: 90203 Episode Num: 2620 Episode T: 16 Reward: 8.500  
Total T: 90219 Episode Num: 2621 Episode T: 16 Reward: 8.500  
Total T: 90237 Episode Num: 2622 Episode T: 18 Reward: 8.300  
Total T: 90264 Episode Num: 2623 Episode T: 27 Reward: 7.400  
Total T: 90283 Episode Num: 2624 Episode T: 19 Reward: 8.200  
Total T: 90301 Episode Num: 2625 Episode T: 18 Reward: 8.300  
Total T: 90320 Episode Num: 2626 Episode T: 19 Reward: 8.200  
Total T: 90345 Episode Num: 2627 Episode T: 25 Reward: 7.600  
Total T: 90356 Episode Num: 2628 Episode T: 11 Reward: 9.000  
Total T: 90359 Episode Num: 2629 Episode T: 3 Reward: 9.800  
Total T: 90378 Episode Num: 2630 Episode T: 19 Reward: 8.200  
Total T: 90421 Episode Num: 2631 Episode T: 43 Reward: 5.800  
Total T: 90487 Episode Num: 2632 Episode T: 66 Reward: -6.600  
Total T: 90510 Episode Num: 2633 Episode T: 23 Reward: 7.800  
Total T: 90532 Episode Num: 2634 Episode T: 22 Reward: 7.900  
Total T: 90549 Episode Num: 2635 Episode T: 17 Reward: 8.400  
Total T: 90558 Episode Num: 2636 Episode T: 9 Reward: 9.200  
Total T: 90577 Episode Num: 2637 Episode T: 19 Reward: 8.200  
Total T: 90598 Episode Num: 2638 Episode T: 21 Reward: 8.000  
Total T: 90627 Episode Num: 2639 Episode T: 29 Reward: 7.200  
Total T: 90645 Episode Num: 2640 Episode T: 18 Reward: 8.300  
Total T: 90659 Episode Num: 2641 Episode T: 14 Reward: 8.700  
Total T: 90667 Episode Num: 2642 Episode T: 8 Reward: 9.300  
Total T: 90679 Episode Num: 2643 Episode T: 12 Reward: 8.900  
Total T: 90703 Episode Num: 2644 Episode T: 24 Reward: 7.700  
Total T: 90719 Episode Num: 2645 Episode T: 16 Reward: 8.500  
Total T: 90729 Episode Num: 2646 Episode T: 10 Reward: 9.100  
Total T: 90744 Episode Num: 2647 Episode T: 15 Reward: 8.600  
Total T: 90763 Episode Num: 2648 Episode T: 19 Reward: 8.200  
Total T: 90800 Episode Num: 2649 Episode T: 37 Reward: 6.400  
Total T: 90817 Episode Num: 2650 Episode T: 17 Reward: 8.400  
Total T: 90838 Episode Num: 2651 Episode T: 21 Reward: 8.000  
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Total T: 90870 Episode Num: 2653 Episode T: 18 Reward: 8.300  
Total T: 90874 Episode Num: 2654 Episode T: 4 Reward: 9.700  
Total T: 90889 Episode Num: 2655 Episode T: 15 Reward: 8.600  
Total T: 90909 Episode Num: 2656 Episode T: 20 Reward: 8.100  
Total T: 90926 Episode Num: 2657 Episode T: 17 Reward: 8.400  
Total T: 90941 Episode Num: 2658 Episode T: 15 Reward: 8.600  
Total T: 90967 Episode Num: 2659 Episode T: 26 Reward: 7.500  
Total T: 90969 Episode Num: 2660 Episode T: 2 Reward: 9.900  
Total T: 90984 Episode Num: 2661 Episode T: 15 Reward: 8.600  
Total T: 90996 Episode Num: 2662 Episode T: 12 Reward: 8.900  
recent Evaluation: 4.5299999999999988  
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Total T: 91044 Episode Num: 2664 Episode T: 23 Reward: 7.800  
Total T: 91071 Episode Num: 2665 Episode T: 27 Reward: 7.400  
Total T: 91097 Episode Num: 2666 Episode T: 26 Reward: 7.500  
Total T: 91116 Episode Num: 2667 Episode T: 19 Reward: 8.200  
Total T: 91128 Episode Num: 2668 Episode T: 12 Reward: 8.900  
Total T: 91137 Episode Num: 2669 Episode T: 9 Reward: 9.200  
Total T: 91142 Episode Num: 2670 Episode T: 5 Reward: 9.600  
Total T: 91154 Episode Num: 2671 Episode T: 12 Reward: 8.900  
Total T: 91187 Episode Num: 2672 Episode T: 33 Reward: 6.800  
Total T: 91216 Episode Num: 2673 Episode T: 29 Reward: 7.200  
Total T: 91225 Episode Num: 2674 Episode T: 9 Reward: 9.200  
Total T: 91237 Episode Num: 2675 Episode T: 12 Reward: 8.900  
Total T: 91268 Episode Num: 2676 Episode T: 31 Reward: 7.000  
Total T: 91273 Episode Num: 2677 Episode T: 5 Reward: 9.600  
Total T: 91282 Episode Num: 2678 Episode T: 9 Reward: 9.200  
Total T: 91320 Episode Num: 2679 Episode T: 38 Reward: 6.300  
Total T: 91329 Episode Num: 2680 Episode T: 9 Reward: 9.200  
Total T: 91349 Episode Num: 2681 Episode T: 20 Reward: 8.100  
Total T: 91380 Episode Num: 2682 Episode T: 31 Reward: 7.000  
Total T: 91399 Episode Num: 2683 Episode T: 19 Reward: 8.200  
Total T: 91442 Episode Num: 2684 Episode T: 43 Reward: 5.800  
Total T: 91460 Episode Num: 2685 Episode T: 18 Reward: 8.300  
Total T: 91475 Episode Num: 2686 Episode T: 15 Reward: 8.600  
Total T: 91496 Episode Num: 2687 Episode T: 21 Reward: 8.000  
Total T: 91538 Episode Num: 2688 Episode T: 42 Reward: 5.900  
Total T: 91555 Episode Num: 2689 Episode T: 17 Reward: 8.400  
Total T: 91572 Episode Num: 2690 Episode T: 17 Reward: 8.400  
Total T: 91599 Episode Num: 2691 Episode T: 27 Reward: 7.400  
Total T: 91603 Episode Num: 2692 Episode T: 4 Reward: 9.700  
Total T: 91626 Episode Num: 2693 Episode T: 23 Reward: 7.800  
Total T: 91664 Episode Num: 2694 Episode T: 38 Reward: 6.300  
Total T: 91669 Episode Num: 2695 Episode T: 5 Reward: 9.600  
Total T: 91687 Episode Num: 2696 Episode T: 18 Reward: 8.300  
Total T: 91704 Episode Num: 2697 Episode T: 17 Reward: 8.400  
Total T: 91742 Episode Num: 2698 Episode T: 38 Reward: 6.300  
Total T: 91760 Episode Num: 2699 Episode T: 18 Reward: 8.300  
Total T: 91809 Episode Num: 2700 Episode T: 49 Reward: 5.200  
Total T: 91822 Episode Num: 2701 Episode T: 13 Reward: 8.800  
Total T: 91861 Episode Num: 2702 Episode T: 39 Reward: 6.200  
Total T: 91871 Episode Num: 2703 Episode T: 10 Reward: 9.100  
Total T: 91911 Episode Num: 2704 Episode T: 40 Reward: 6.100  
Total T: 91924 Episode Num: 2705 Episode T: 13 Reward: 8.800  
Total T: 91963 Episode Num: 2706 Episode T: 39 Reward: 6.200  
recent Evaluation: 1.1300000000000003  
Total T: 92025 Episode Num: 2707 Episode T: 62 Reward: 3.900  
Total T: 92030 Episode Num: 2708 Episode T: 5 Reward: 9.600  
Total T: 92031 Episode Num: 2709 Episode T: 1 Reward: 10.000  
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Total T: 92094 Episode Num: 2711 Episode T: 14 Reward: 8.700  
Total T: 92101 Episode Num: 2712 Episode T: 7 Reward: 9.400  
Total T: 92117 Episode Num: 2713 Episode T: 16 Reward: 8.500  
Total T: 92144 Episode Num: 2714 Episode T: 27 Reward: 7.400  
Total T: 92173 Episode Num: 2715 Episode T: 29 Reward: 7.200  
Total T: 92190 Episode Num: 2716 Episode T: 17 Reward: 8.400  
Total T: 92210 Episode Num: 2717 Episode T: 20 Reward: 8.100  
Total T: 92222 Episode Num: 2718 Episode T: 12 Reward: 8.900  
Total T: 92244 Episode Num: 2719 Episode T: 22 Reward: 7.900  
Total T: 92264 Episode Num: 2720 Episode T: 20 Reward: 8.100  
Total T: 92268 Episode Num: 2721 Episode T: 4 Reward: 9.700  
Total T: 92281 Episode Num: 2722 Episode T: 13 Reward: 8.800  
Total T: 92299 Episode Num: 2723 Episode T: 18 Reward: 8.300  
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Total T: 92346 Episode Num: 2726 Episode T: 20 Reward: 8.100  
Total T: 92356 Episode Num: 2727 Episode T: 10 Reward: 9.100  
Total T: 92369 Episode Num: 2728 Episode T: 13 Reward: 8.800

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Total T: 92377 Episode Num: 2729 Episode T: 8 Reward: 9.300
Total T: 92378 Episode Num: 2730 Episode T: 1 Reward: 10.000
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Total T: 92422 Episode Num: 2732 Episode T: 16 Reward: 8.500
Total T: 92426 Episode Num: 2733 Episode T: 4 Reward: 9.700
Total T: 92437 Episode Num: 2734 Episode T: 11 Reward: 9.000
Total T: 92462 Episode Num: 2735 Episode T: 25 Reward: 7.600
Total T: 92482 Episode Num: 2736 Episode T: 20 Reward: 8.100
Total T: 92504 Episode Num: 2737 Episode T: 22 Reward: 7.900
Total T: 92547 Episode Num: 2738 Episode T: 43 Reward: 5.800
Total T: 92549 Episode Num: 2739 Episode T: 2 Reward: 9.900
Total T: 92567 Episode Num: 2740 Episode T: 18 Reward: 8.300
Total T: 92610 Episode Num: 2741 Episode T: 43 Reward: 5.800
Total T: 92620 Episode Num: 2742 Episode T: 10 Reward: 9.100
Total T: 92640 Episode Num: 2743 Episode T: 20 Reward: 8.100
Total T: 92652 Episode Num: 2744 Episode T: 12 Reward: 8.900
Total T: 92669 Episode Num: 2745 Episode T: 17 Reward: 8.400
Total T: 92703 Episode Num: 2746 Episode T: 34 Reward: 6.700
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Total T: 92750 Episode Num: 2748 Episode T: 6 Reward: 9.500
Total T: 92761 Episode Num: 2749 Episode T: 11 Reward: 9.000
Total T: 92778 Episode Num: 2750 Episode T: 17 Reward: 8.400
Total T: 92788 Episode Num: 2751 Episode T: 10 Reward: 9.100
Total T: 92803 Episode Num: 2752 Episode T: 15 Reward: 8.600
Total T: 92813 Episode Num: 2753 Episode T: 10 Reward: 9.100
Total T: 92838 Episode Num: 2754 Episode T: 25 Reward: 7.600
Total T: 92858 Episode Num: 2755 Episode T: 20 Reward: 8.100
Total T: 92871 Episode Num: 2756 Episode T: 13 Reward: 8.800
Total T: 92874 Episode Num: 2757 Episode T: 3 Reward: 9.800
Total T: 92894 Episode Num: 2758 Episode T: 20 Reward: 8.100
Total T: 92928 Episode Num: 2759 Episode T: 34 Reward: 6.700
Total T: 92939 Episode Num: 2760 Episode T: 11 Reward: 9.000
Total T: 92953 Episode Num: 2761 Episode T: 14 Reward: 8.700
Total T: 92967 Episode Num: 2762 Episode T: 14 Reward: 8.700
Total T: 92985 Episode Num: 2763 Episode T: 18 Reward: 8.300
Total T: 92987 Episode Num: 2764 Episode T: 2 Reward: 9.900
recent Evaluation: 8.89
Total T: 93007 Episode Num: 2765 Episode T: 20 Reward: 8.100
Total T: 93020 Episode Num: 2766 Episode T: 13 Reward: 8.800
Total T: 93071 Episode Num: 2767 Episode T: 51 Reward: 5.000
Total T: 93096 Episode Num: 2768 Episode T: 25 Reward: 7.600
Total T: 93104 Episode Num: 2769 Episode T: 8 Reward: 9.300
Total T: 93111 Episode Num: 2770 Episode T: 7 Reward: 9.400
Total T: 93125 Episode Num: 2771 Episode T: 14 Reward: 8.700
Total T: 93148 Episode Num: 2772 Episode T: 23 Reward: 7.800
Total T: 93165 Episode Num: 2773 Episode T: 17 Reward: 8.400
Total T: 93176 Episode Num: 2774 Episode T: 11 Reward: 9.000
Total T: 93242 Episode Num: 2775 Episode T: 66 Reward: -6.600
Total T: 93259 Episode Num: 2776 Episode T: 17 Reward: 8.400
Total T: 93287 Episode Num: 2777 Episode T: 28 Reward: 7.300
Total T: 93301 Episode Num: 2778 Episode T: 14 Reward: 8.700
Total T: 93310 Episode Num: 2779 Episode T: 9 Reward: 9.200
Total T: 93322 Episode Num: 2780 Episode T: 12 Reward: 8.900
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Total T: 93361 Episode Num: 2783 Episode T: 17 Reward: 8.400
Total T: 93391 Episode Num: 2784 Episode T: 30 Reward: 7.100
Total T: 93419 Episode Num: 2785 Episode T: 28 Reward: 7.300
Total T: 93430 Episode Num: 2786 Episode T: 11 Reward: 9.000
Total T: 93445 Episode Num: 2787 Episode T: 15 Reward: 8.600
Total T: 93459 Episode Num: 2788 Episode T: 14 Reward: 8.700
Total T: 93493 Episode Num: 2789 Episode T: 34 Reward: 6.700
Total T: 93525 Episode Num: 2790 Episode T: 32 Reward: 6.900
Total T: 93540 Episode Num: 2791 Episode T: 15 Reward: 8.600
Total T: 93575 Episode Num: 2792 Episode T: 35 Reward: 6.600
Total T: 93591 Episode Num: 2793 Episode T: 16 Reward: 8.500
Total T: 93605 Episode Num: 2794 Episode T: 14 Reward: 8.700
Total T: 93626 Episode Num: 2795 Episode T: 21 Reward: 8.000
Total T: 93646 Episode Num: 2796 Episode T: 20 Reward: 8.100
Total T: 93665 Episode Num: 2797 Episode T: 19 Reward: 8.200
Total T: 93731 Episode Num: 2798 Episode T: 66 Reward: -6.600
Total T: 93765 Episode Num: 2799 Episode T: 34 Reward: 6.700
Total T: 93772 Episode Num: 2800 Episode T: 7 Reward: 9.400
Total T: 93830 Episode Num: 2801 Episode T: 58 Reward: 4.300
Total T: 93834 Episode Num: 2802 Episode T: 4 Reward: 9.700
Total T: 93851 Episode Num: 2803 Episode T: 17 Reward: 8.400
Total T: 93874 Episode Num: 2804 Episode T: 23 Reward: 7.800
Total T: 93888 Episode Num: 2805 Episode T: 14 Reward: 8.700
Total T: 93900 Episode Num: 2806 Episode T: 12 Reward: 8.900
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Total T: 93928 Episode Num: 2808 Episode T: 22 Reward: 7.900
Total T: 93955 Episode Num: 2809 Episode T: 27 Reward: 7.400
Total T: 93961 Episode Num: 2810 Episode T: 6 Reward: 9.500
Total T: 93995 Episode Num: 2811 Episode T: 34 Reward: 6.700
recent Evaluation: 8.790000000000003
Total T: 94009 Episode Num: 2812 Episode T: 14 Reward: 8.700
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Total T: 94043 Episode Num: 2814 Episode T: 17 Reward: 8.400
Total T: 94084 Episode Num: 2815 Episode T: 41 Reward: 6.000
Total T: 94103 Episode Num: 2816 Episode T: 19 Reward: 8.200
Total T: 94107 Episode Num: 2817 Episode T: 4 Reward: 9.700
Total T: 94118 Episode Num: 2818 Episode T: 11 Reward: 9.000
Total T: 94147 Episode Num: 2819 Episode T: 29 Reward: 7.200
Total T: 94163 Episode Num: 2820 Episode T: 16 Reward: 8.500
Total T: 94176 Episode Num: 2821 Episode T: 13 Reward: 8.800
Total T: 94196 Episode Num: 2822 Episode T: 20 Reward: 8.100
Total T: 94226 Episode Num: 2823 Episode T: 30 Reward: 7.100
Total T: 94236 Episode Num: 2824 Episode T: 10 Reward: 9.100
Total T: 94253 Episode Num: 2825 Episode T: 17 Reward: 8.400
Total T: 94273 Episode Num: 2826 Episode T: 20 Reward: 8.100
Total T: 94277 Episode Num: 2827 Episode T: 4 Reward: 9.700
Total T: 94291 Episode Num: 2828 Episode T: 14 Reward: 8.700
Total T: 94307 Episode Num: 2829 Episode T: 16 Reward: 8.500
Total T: 94325 Episode Num: 2830 Episode T: 18 Reward: 8.300
Total T: 94340 Episode Num: 2831 Episode T: 15 Reward: 8.600
Total T: 94344 Episode Num: 2832 Episode T: 4 Reward: 9.700
Total T: 94380 Episode Num: 2833 Episode T: 36 Reward: 6.500
Total T: 94383 Episode Num: 2834 Episode T: 3 Reward: 9.800
Total T: 94391 Episode Num: 2835 Episode T: 8 Reward: 9.300
Total T: 94425 Episode Num: 2836 Episode T: 34 Reward: 6.700
Total T: 94456 Episode Num: 2837 Episode T: 31 Reward: 7.000
Total T: 94472 Episode Num: 2838 Episode T: 16 Reward: 8.500
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Total T: 94497 Episode Num: 2840 Episode T: 13 Reward: 8.800
Total T: 94503 Episode Num: 2841 Episode T: 6 Reward: 9.500
Total T: 94525 Episode Num: 2842 Episode T: 22 Reward: 7.900

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Total T: 94559 Episode Num: 2843 Episode T: 34 Reward: 6.700  
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 Total T: 94581 Episode Num: 2845 Episode T: 9 Reward: 9.200  
 Total T: 94595 Episode Num: 2846 Episode T: 14 Reward: 8.700  
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 Total T: 94969 Episode Num: 2869 Episode T: 12 Reward: 8.900  
 Total T: 94979 Episode Num: 2870 Episode T: 10 Reward: 9.100  
 Total T: 94996 Episode Num: 2871 Episode T: 17 Reward: 8.400  
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 Total T: 95099 Episode Num: 2877 Episode T: 16 Reward: 8.500  
 Total T: 95116 Episode Num: 2878 Episode T: 17 Reward: 8.400  
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 Total T: 95242 Episode Num: 2884 Episode T: 17 Reward: 8.400  
 Total T: 95258 Episode Num: 2885 Episode T: 16 Reward: 8.500  
 Total T: 95268 Episode Num: 2886 Episode T: 10 Reward: 9.100  
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 Total T: 95286 Episode Num: 2888 Episode T: 11 Reward: 9.000  
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 Total T: 95343 Episode Num: 2892 Episode T: 12 Reward: 8.900  
 Total T: 95357 Episode Num: 2893 Episode T: 14 Reward: 8.700  
 Total T: 95371 Episode Num: 2894 Episode T: 14 Reward: 8.700  
 Total T: 95378 Episode Num: 2895 Episode T: 7 Reward: 9.400  
 Total T: 95394 Episode Num: 2896 Episode T: 16 Reward: 8.500  
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 Total T: 95489 Episode Num: 2902 Episode T: 18 Reward: 8.300  
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 Total T: 95765 Episode Num: 2918 Episode T: 19 Reward: 8.200  
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 recent Evaluation: 9.050000000000006  
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 Total T: 96408 Episode Num: 2956 Episode T: 3 Reward: 9.800

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Total T: 96504 Episode Num: 2962 Episode T: 26 Reward: 7.500
Total T: 96525 Episode Num: 2963 Episode T: 21 Reward: 8.000
Total T: 96537 Episode Num: 2964 Episode T: 12 Reward: 8.900
Total T: 96575 Episode Num: 2965 Episode T: 38 Reward: 6.300
Total T: 96586 Episode Num: 2966 Episode T: 11 Reward: 9.000
Total T: 96598 Episode Num: 2967 Episode T: 12 Reward: 8.900
Total T: 96614 Episode Num: 2968 Episode T: 16 Reward: 8.500
Total T: 96628 Episode Num: 2969 Episode T: 14 Reward: 8.700
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Total T: 96675 Episode Num: 2973 Episode T: 15 Reward: 8.600
Total T: 96692 Episode Num: 2974 Episode T: 17 Reward: 8.400
Total T: 96704 Episode Num: 2975 Episode T: 12 Reward: 8.900
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Total T: 96735 Episode Num: 2977 Episode T: 11 Reward: 9.000
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Total T: 96782 Episode Num: 2979 Episode T: 40 Reward: 6.100
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Total T: 96930 Episode Num: 2985 Episode T: 16 Reward: 8.500
Total T: 96939 Episode Num: 2986 Episode T: 9 Reward: 9.200
Total T: 96952 Episode Num: 2987 Episode T: 13 Reward: 8.800
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Total T: 97060 Episode Num: 2994 Episode T: 13 Reward: 8.800
Total T: 97068 Episode Num: 2995 Episode T: 8 Reward: 9.300
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Total T: 97321 Episode Num: 3011 Episode T: 7 Reward: 9.400
Total T: 97340 Episode Num: 3012 Episode T: 19 Reward: 8.200
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Total T: 97374 Episode Num: 3015 Episode T: 11 Reward: 9.000
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Total T: 97425 Episode Num: 3017 Episode T: 10 Reward: 9.100
Total T: 97447 Episode Num: 3018 Episode T: 22 Reward: 7.900
Total T: 97473 Episode Num: 3019 Episode T: 26 Reward: 7.500
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Total T: 97514 Episode Num: 3022 Episode T: 15 Reward: 8.600
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Total T: 97696 Episode Num: 3030 Episode T: 20 Reward: 8.100
Total T: 97718 Episode Num: 3031 Episode T: 22 Reward: 7.900
Total T: 97736 Episode Num: 3032 Episode T: 18 Reward: 8.300
Total T: 97750 Episode Num: 3033 Episode T: 14 Reward: 8.700
Total T: 97772 Episode Num: 3034 Episode T: 22 Reward: 7.900
Total T: 97796 Episode Num: 3035 Episode T: 24 Reward: 7.700
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Total T: 97823 Episode Num: 3037 Episode T: 21 Reward: 8.000
Total T: 97829 Episode Num: 3038 Episode T: 6 Reward: 9.500
Total T: 97848 Episode Num: 3039 Episode T: 19 Reward: 8.200
Total T: 97877 Episode Num: 3040 Episode T: 29 Reward: 7.200
Total T: 97887 Episode Num: 3041 Episode T: 10 Reward: 9.100
Total T: 97900 Episode Num: 3042 Episode T: 13 Reward: 8.800
Total T: 97911 Episode Num: 3043 Episode T: 11 Reward: 9.000
Total T: 97921 Episode Num: 3044 Episode T: 10 Reward: 9.100
Total T: 97931 Episode Num: 3045 Episode T: 10 Reward: 9.100
Total T: 97944 Episode Num: 3046 Episode T: 13 Reward: 8.800
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Total T: 98039 Episode Num: 3051 Episode T: 4 Reward: 9.700
Total T: 98055 Episode Num: 3052 Episode T: 16 Reward: 8.500
Total T: 98073 Episode Num: 3053 Episode T: 18 Reward: 8.300
Total T: 98083 Episode Num: 3054 Episode T: 10 Reward: 9.100
Total T: 98106 Episode Num: 3055 Episode T: 23 Reward: 7.800
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Total T: 98133 Episode Num: 3057 Episode T: 17 Reward: 8.400
Total T: 98144 Episode Num: 3058 Episode T: 11 Reward: 9.000
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Total T: 98192 Episode Num: 3061 Episode T: 8 Reward: 9.300
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Total T: 98242 Episode Num: 3064 Episode T: 19 Reward: 8.200
Total T: 98254 Episode Num: 3065 Episode T: 12 Reward: 8.900
Total T: 98262 Episode Num: 3066 Episode T: 8 Reward: 9.300
Total T: 98277 Episode Num: 3067 Episode T: 15 Reward: 8.600
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Total T: 98331 Episode Num: 3069 Episode T: 47 Reward: 5.400
Total T: 98343 Episode Num: 3070 Episode T: 12 Reward: 8.900

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Total T: 98432 Episode Num: 3076 Episode T: 2 Reward: 9.900
Total T: 98443 Episode Num: 3077 Episode T: 11 Reward: 9.000
Total T: 98468 Episode Num: 3078 Episode T: 25 Reward: 7.600
Total T: 98485 Episode Num: 3079 Episode T: 17 Reward: 8.400
Total T: 98496 Episode Num: 3080 Episode T: 11 Reward: 9.000
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Total T: 98529 Episode Num: 3082 Episode T: 17 Reward: 8.400
Total T: 98548 Episode Num: 3083 Episode T: 19 Reward: 8.200
Total T: 98559 Episode Num: 3084 Episode T: 11 Reward: 9.000
Total T: 98575 Episode Num: 3085 Episode T: 16 Reward: 8.500
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Total T: 98603 Episode Num: 3087 Episode T: 12 Reward: 8.900
Total T: 98623 Episode Num: 3088 Episode T: 20 Reward: 8.100
Total T: 98629 Episode Num: 3089 Episode T: 6 Reward: 9.500
Total T: 98646 Episode Num: 3090 Episode T: 17 Reward: 8.400
Total T: 98663 Episode Num: 3091 Episode T: 17 Reward: 8.400
Total T: 98709 Episode Num: 3092 Episode T: 46 Reward: 5.500
Total T: 98718 Episode Num: 3093 Episode T: 9 Reward: 9.200
Total T: 98722 Episode Num: 3094 Episode T: 4 Reward: 9.700
Total T: 98735 Episode Num: 3095 Episode T: 13 Reward: 8.800
Total T: 98754 Episode Num: 3096 Episode T: 19 Reward: 8.200
Total T: 98789 Episode Num: 3097 Episode T: 35 Reward: 6.600
Total T: 98811 Episode Num: 3098 Episode T: 22 Reward: 7.900
Total T: 98837 Episode Num: 3099 Episode T: 26 Reward: 7.500
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Total T: 98881 Episode Num: 3103 Episode T: 17 Reward: 8.400
Total T: 98900 Episode Num: 3104 Episode T: 19 Reward: 8.200
Total T: 98911 Episode Num: 3105 Episode T: 11 Reward: 9.000
Total T: 98936 Episode Num: 3106 Episode T: 25 Reward: 7.600
Total T: 98972 Episode Num: 3107 Episode T: 36 Reward: 6.500
Total T: 98983 Episode Num: 3108 Episode T: 11 Reward: 9.000
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recent Evaluation: 8.610000000000001
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Total T: 99044 Episode Num: 3111 Episode T: 15 Reward: 8.600
Total T: 99053 Episode Num: 3112 Episode T: 9 Reward: 9.200
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Total T: 99075 Episode Num: 3114 Episode T: 17 Reward: 8.400
Total T: 99086 Episode Num: 3115 Episode T: 11 Reward: 9.000
Total T: 99102 Episode Num: 3116 Episode T: 16 Reward: 8.500
Total T: 99115 Episode Num: 3117 Episode T: 13 Reward: 8.800
Total T: 99130 Episode Num: 3118 Episode T: 15 Reward: 8.600
Total T: 99159 Episode Num: 3119 Episode T: 29 Reward: 7.200
Total T: 99181 Episode Num: 3120 Episode T: 22 Reward: 7.900
Total T: 99200 Episode Num: 3121 Episode T: 19 Reward: 8.200
Total T: 99215 Episode Num: 3122 Episode T: 15 Reward: 8.600
Total T: 99240 Episode Num: 3123 Episode T: 25 Reward: 7.600
Total T: 99254 Episode Num: 3124 Episode T: 14 Reward: 8.700
Total T: 99267 Episode Num: 3125 Episode T: 13 Reward: 8.800
Total T: 99274 Episode Num: 3126 Episode T: 7 Reward: 9.400
Total T: 99286 Episode Num: 3127 Episode T: 12 Reward: 8.900
Total T: 99303 Episode Num: 3128 Episode T: 17 Reward: 8.400
Total T: 99323 Episode Num: 3129 Episode T: 20 Reward: 8.100
Total T: 99341 Episode Num: 3130 Episode T: 18 Reward: 8.300
Total T: 99356 Episode Num: 3131 Episode T: 15 Reward: 8.600
Total T: 99373 Episode Num: 3132 Episode T: 17 Reward: 8.400
Total T: 99374 Episode Num: 3133 Episode T: 1 Reward: 10.000
Total T: 99393 Episode Num: 3134 Episode T: 19 Reward: 8.200
Total T: 99408 Episode Num: 3135 Episode T: 15 Reward: 8.600
Total T: 99432 Episode Num: 3136 Episode T: 24 Reward: 7.700
Total T: 99444 Episode Num: 3137 Episode T: 12 Reward: 8.900
Total T: 99452 Episode Num: 3138 Episode T: 8 Reward: 9.300
Total T: 99466 Episode Num: 3139 Episode T: 14 Reward: 8.700
Total T: 99488 Episode Num: 3140 Episode T: 22 Reward: 7.900
Total T: 99512 Episode Num: 3141 Episode T: 24 Reward: 7.700
Total T: 99537 Episode Num: 3142 Episode T: 25 Reward: 7.600
Total T: 99547 Episode Num: 3143 Episode T: 10 Reward: 9.100
```

```
In [16... # This section is used to visualize your learned policy
from torch import Tensor
output_i = np.zeros((33,33))
output_j = np.zeros((33,33))
output_i_m = np.zeros((33,33))
output_j_m = np.zeros((33,33))
value_ij = np.zeros((33,33))
for i in range(33):
    for j in range(33):
        states = Tensor(np.asarray([i,j])).float().unsqueeze(0)

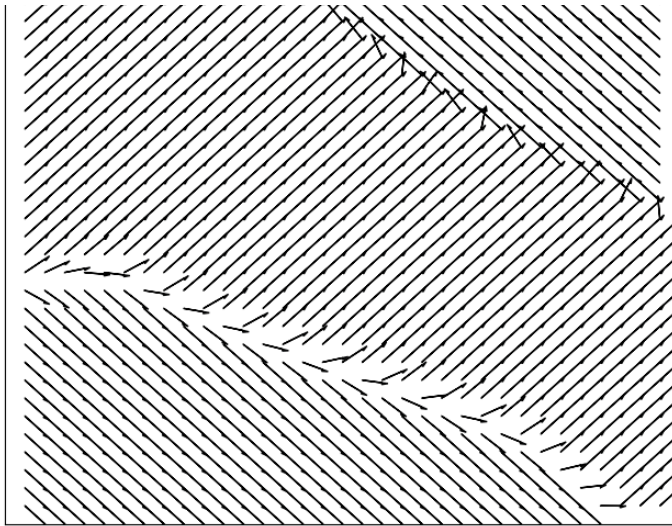
        ...
        you need to revise the following line,
        to fit your policy/network outputs
        ...

        action = policy.select_action(states)
        # action, value = policy(states)
        output_i[i,j] = action[0]
        output_j[i,j] = action[1]
        value_ij[i,j] = value

plt.figure(figsize=(5,5))
for i in range(33):
    for j in range(33):
        plt.arrow(j,-i,output_j[i,j],-output_i[i,j],head_width=0.2,shape='left')
xlim(-1,33)
ylim(-33,1)
yticks([2*i-32 for i in range(17)], [2*i for i in range(17)])
plt.xticks([])
plt.yticks([])
```







Out[16... ([], [])

## DDPG-FourWayGridWorld

```
In [3]: # The following scripts run the DDPG algorithm.

alias = 'ddpg' # an alias of your experiment, used as a label
ENV_NAME = 'FourWayGridWorld'

import matplotlib.pyplot as plt
import numpy as np
import torch
import gym
import argparse
import os
import torch.nn.functional as F
import utils
import TD3
import DDPG

def eval_policy(policy, eval_episodes=10):
    eval_env = FourWayGridWorld(33)

    avg_reward = 0.
    for _ in range(eval_episodes):
        state, done = eval_env.reset(), False
        while not done:
            action = policy.select_action(np.array(state))
            state, reward, done = eval_env.step(action)
            avg_reward += reward

    avg_reward /= eval_episodes
    #print("-----")
    #print(f"Evaluation over {eval_episodes} episodes: {avg_reward:.3f}")
    #print("-----")
    return avg_reward

env = FourWayGridWorld(33)
torch.manual_seed(0)
np.random.seed(0)

state_dim = env.observation_space.shape[0]
action_dim = env.action_space.shape[0]
max_action = 1

args_policy_noise = 0.001
args_noise_clip = 0.5
args_policy_freq = 2
args_max_timesteps = 80000
args_expl_noise = 0.1
args_batch_size = 25
args_eval_freq = 1000
args_start_timesteps = 0

kwargs = {
    "state_dim": state_dim,
    "action_dim": action_dim,
    "max_action": max_action,
    "discount": 0.99,
    "tau": 0.005
}

args_policy = 'DDPG'

if args_policy == "TD3":
    # Target policy smoothing is scaled wrt the action scale
    kwargs["policy_noise"] = args_policy_noise * max_action
    kwargs["noise_clip"] = args_noise_clip * max_action
    kwargs["policy_freq"] = args_policy_freq
    policy = TD3.TD3(**kwargs)
elif args_policy == "DDPG":
    policy = DDPG.DDPG(**kwargs)
replay_buffer = utils.ReplayBuffer(state_dim, action_dim)

# Evaluate untrained policy
evaluations = [eval_policy(policy)]
```

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state, done = env.reset(), False
episode_reward = 0
episode_timesteps = 0
episode_num = 0
counter = 0
msk_list = []
temp_curve = [eval_policy(policy)]
temp_val = []
for t in range(int(args_max_timesteps)):
    episode_timesteps += 1
    counter += 1
    # Select action randomly or according to policy
    if t < args_start_timesteps:
        action = np.random.uniform(-max_action, max_action, action_dim)
    else:
        # ε-greedy strategy
        if np.random.uniform(0,1) < 0.1:
            action = np.random.uniform(-max_action, max_action, action_dim)
        else:
            action = (
                policy.select_action(np.array(state))
                + np.random.normal(0, max_action * args_expl_noise, size=action_dim)
                ).clip(-max_action, max_action)

    # Perform action
    next_state, reward, done = env.step(action)
    done_bool = float(done) if episode_timesteps < 2*env.N else 0

    replay_buffer.add(state, action, next_state, reward, done_bool)

    state = next_state
    episode_reward += reward

    if t >= args_start_timesteps:
        '''TD3'''
        last_val = 999.
        patient = 5
        for i in range(1):
            policy.train(replay_buffer, args_batch_size)

# Train agent after collecting sufficient data
if done:
    print(f"Total T: {t+1} Episode Num: {episode_num+1} Episode T: {episode_timesteps} Reward: {episode_reward:.3f}")
    msk_list = []
    state, done = env.reset(), False
    episode_reward = 0
    episode_timesteps = 0
    episode_num += 1

# Evaluate episode
if (t + 1) % args_eval_freq == 0:
    evaluations.append(eval_policy(policy))
    print('recent Evaluation:', evaluations[-1])
    np.save('results/FourWayGridWorld_evaluations_alias{}_ENV{}'.format(alias, ENV_NAME), evaluations)

Total T: 46 Episode Num: 1 Episode T: 46 Reward: 5.500
Total T: 112 Episode Num: 2 Episode T: 66 Reward: -6.600
Total T: 125 Episode Num: 3 Episode T: 13 Reward: 8.800
Total T: 191 Episode Num: 4 Episode T: 66 Reward: -6.600
Total T: 257 Episode Num: 5 Episode T: 66 Reward: -6.600
Total T: 323 Episode Num: 6 Episode T: 66 Reward: -6.600
Total T: 389 Episode Num: 7 Episode T: 66 Reward: -6.600
Total T: 455 Episode Num: 8 Episode T: 66 Reward: -6.600
Total T: 463 Episode Num: 9 Episode T: 8 Reward: 9.300
Total T: 529 Episode Num: 10 Episode T: 66 Reward: -6.600
Total T: 595 Episode Num: 11 Episode T: 66 Reward: -6.600
Total T: 601 Episode Num: 12 Episode T: 6 Reward: 9.500
Total T: 667 Episode Num: 13 Episode T: 66 Reward: -6.600
Total T: 733 Episode Num: 14 Episode T: 66 Reward: -6.600
Total T: 799 Episode Num: 15 Episode T: 66 Reward: -6.600
Total T: 865 Episode Num: 16 Episode T: 66 Reward: -6.600
Total T: 873 Episode Num: 17 Episode T: 8 Reward: 9.300
Total T: 939 Episode Num: 18 Episode T: 66 Reward: -6.600
recent Evaluation: -1.8500000000000003
Total T: 1005 Episode Num: 19 Episode T: 66 Reward: -6.600
Total T: 1071 Episode Num: 20 Episode T: 66 Reward: -6.600
Total T: 1137 Episode Num: 21 Episode T: 66 Reward: -6.600
Total T: 1142 Episode Num: 22 Episode T: 5 Reward: 9.600
Total T: 1208 Episode Num: 23 Episode T: 66 Reward: -6.600
Total T: 1274 Episode Num: 24 Episode T: 66 Reward: -6.600
Total T: 1340 Episode Num: 25 Episode T: 66 Reward: -6.600
Total T: 1406 Episode Num: 26 Episode T: 66 Reward: -6.600
Total T: 1472 Episode Num: 27 Episode T: 66 Reward: -6.600
Total T: 1538 Episode Num: 28 Episode T: 66 Reward: -6.600
Total T: 1604 Episode Num: 29 Episode T: 66 Reward: -6.600
Total T: 1608 Episode Num: 30 Episode T: 4 Reward: 9.700
Total T: 1674 Episode Num: 31 Episode T: 66 Reward: -6.600
Total T: 1687 Episode Num: 32 Episode T: 13 Reward: 8.800
Total T: 1700 Episode Num: 33 Episode T: 13 Reward: 8.800
Total T: 1707 Episode Num: 34 Episode T: 7 Reward: 9.400
Total T: 1729 Episode Num: 35 Episode T: 22 Reward: 7.900
Total T: 1795 Episode Num: 36 Episode T: 66 Reward: -6.600
Total T: 1861 Episode Num: 37 Episode T: 66 Reward: -6.600
Total T: 1927 Episode Num: 38 Episode T: 66 Reward: -6.600
Total T: 1993 Episode Num: 39 Episode T: 66 Reward: -6.600
recent Evaluation: 1.4499999999999982
Total T: 2059 Episode Num: 40 Episode T: 66 Reward: -6.600
Total T: 2125 Episode Num: 41 Episode T: 66 Reward: -6.600
Total T: 2139 Episode Num: 42 Episode T: 14 Reward: 8.700
Total T: 2205 Episode Num: 43 Episode T: 66 Reward: -6.600
Total T: 2219 Episode Num: 44 Episode T: 14 Reward: 8.700
Total T: 2285 Episode Num: 45 Episode T: 66 Reward: -6.600
Total T: 2351 Episode Num: 46 Episode T: 66 Reward: -6.600
Total T: 2417 Episode Num: 47 Episode T: 66 Reward: -6.600
Total T: 2483 Episode Num: 48 Episode T: 66 Reward: -6.600
Total T: 2549 Episode Num: 49 Episode T: 66 Reward: -6.600
Total T: 2615 Episode Num: 50 Episode T: 66 Reward: -6.600
Total T: 2681 Episode Num: 51 Episode T: 66 Reward: -6.600
Total T: 2697 Episode Num: 52 Episode T: 16 Reward: 8.500
Total T: 2708 Episode Num: 53 Episode T: 11 Reward: 9.000
Total T: 2774 Episode Num: 54 Episode T: 66 Reward: -6.600
Total T: 2788 Episode Num: 55 Episode T: 14 Reward: 8.700
Total T: 2854 Episode Num: 56 Episode T: 66 Reward: -6.600
Total T: 2920 Episode Num: 57 Episode T: 66 Reward: -6.600
Total T: 2986 Episode Num: 58 Episode T: 66 Reward: -6.600

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recent Evaluation: -1.970000000000026
Total T: 3052 Episode Num: 59 Episode T: 66 Reward: -6.600
Total T: 3118 Episode Num: 60 Episode T: 66 Reward: -6.600
Total T: 3184 Episode Num: 61 Episode T: 66 Reward: -6.600
Total T: 3250 Episode Num: 62 Episode T: 66 Reward: -6.600
Total T: 3316 Episode Num: 63 Episode T: 66 Reward: -6.600
Total T: 3382 Episode Num: 64 Episode T: 66 Reward: -6.600
Total T: 3448 Episode Num: 65 Episode T: 66 Reward: -6.600
Total T: 3514 Episode Num: 66 Episode T: 66 Reward: -6.600
Total T: 3580 Episode Num: 67 Episode T: 66 Reward: -6.600
Total T: 3646 Episode Num: 68 Episode T: 66 Reward: -6.600
Total T: 3712 Episode Num: 69 Episode T: 66 Reward: -6.600
Total T: 3732 Episode Num: 70 Episode T: 20 Reward: 8.100
Total T: 3798 Episode Num: 71 Episode T: 66 Reward: -6.600
Total T: 3809 Episode Num: 72 Episode T: 11 Reward: 9.000
Total T: 3875 Episode Num: 73 Episode T: 66 Reward: -6.600
Total T: 3894 Episode Num: 74 Episode T: 19 Reward: 8.200
Total T: 3960 Episode Num: 75 Episode T: 66 Reward: -6.600
recent Evaluation: -3.430000000000019
Total T: 4026 Episode Num: 76 Episode T: 66 Reward: -6.600
Total T: 4045 Episode Num: 77 Episode T: 19 Reward: 8.200
Total T: 4111 Episode Num: 78 Episode T: 66 Reward: -6.600
Total T: 4177 Episode Num: 79 Episode T: 66 Reward: -6.600
Total T: 4243 Episode Num: 80 Episode T: 66 Reward: -6.600
Total T: 4309 Episode Num: 81 Episode T: 66 Reward: -6.600
Total T: 4325 Episode Num: 82 Episode T: 16 Reward: 8.500
Total T: 4391 Episode Num: 83 Episode T: 66 Reward: -6.600
Total T: 4457 Episode Num: 84 Episode T: 66 Reward: -6.600
Total T: 4523 Episode Num: 85 Episode T: 66 Reward: -6.600
Total T: 4589 Episode Num: 86 Episode T: 66 Reward: -6.600
Total T: 4655 Episode Num: 87 Episode T: 66 Reward: -6.600
Total T: 4721 Episode Num: 88 Episode T: 66 Reward: -6.600
Total T: 4787 Episode Num: 89 Episode T: 66 Reward: -6.600
Total T: 4799 Episode Num: 90 Episode T: 12 Reward: 8.900
Total T: 4865 Episode Num: 91 Episode T: 66 Reward: -6.600
Total T: 4931 Episode Num: 92 Episode T: 66 Reward: -6.600
Total T: 4939 Episode Num: 93 Episode T: 8 Reward: 9.300
recent Evaluation: -3.490000000000004
Total T: 5005 Episode Num: 94 Episode T: 66 Reward: -6.600
Total T: 5071 Episode Num: 95 Episode T: 66 Reward: -6.600
Total T: 5074 Episode Num: 96 Episode T: 3 Reward: 9.800
Total T: 5140 Episode Num: 97 Episode T: 66 Reward: -6.600
Total T: 5206 Episode Num: 98 Episode T: 66 Reward: -6.600
Total T: 5272 Episode Num: 99 Episode T: 66 Reward: -6.600
Total T: 5285 Episode Num: 100 Episode T: 13 Reward: 8.800
Total T: 5351 Episode Num: 101 Episode T: 66 Reward: -6.600
Total T: 5417 Episode Num: 102 Episode T: 66 Reward: -6.600
Total T: 5483 Episode Num: 103 Episode T: 66 Reward: -6.600
Total T: 5549 Episode Num: 104 Episode T: 66 Reward: -6.600
Total T: 5555 Episode Num: 105 Episode T: 6 Reward: 9.500
Total T: 5621 Episode Num: 106 Episode T: 66 Reward: -6.600
Total T: 5687 Episode Num: 107 Episode T: 66 Reward: -6.600
Total T: 5753 Episode Num: 108 Episode T: 66 Reward: -6.600
Total T: 5764 Episode Num: 109 Episode T: 11 Reward: 9.000
Total T: 5830 Episode Num: 110 Episode T: 66 Reward: -6.600
Total T: 5896 Episode Num: 111 Episode T: 66 Reward: -6.600
Total T: 5910 Episode Num: 112 Episode T: 14 Reward: 8.700
Total T: 5976 Episode Num: 113 Episode T: 66 Reward: -6.600
Total T: 5991 Episode Num: 114 Episode T: 15 Reward: 8.600
recent Evaluation: -0.41999999999999693
Total T: 6004 Episode Num: 115 Episode T: 13 Reward: 8.800
Total T: 6070 Episode Num: 116 Episode T: 66 Reward: -6.600
Total T: 6136 Episode Num: 117 Episode T: 66 Reward: -6.600
Total T: 6202 Episode Num: 118 Episode T: 66 Reward: -6.600
Total T: 6268 Episode Num: 119 Episode T: 66 Reward: -6.600
Total T: 6282 Episode Num: 120 Episode T: 14 Reward: 8.700
Total T: 6294 Episode Num: 121 Episode T: 12 Reward: 8.900
Total T: 6360 Episode Num: 122 Episode T: 66 Reward: -6.600
Total T: 6426 Episode Num: 123 Episode T: 66 Reward: -6.600
Total T: 6436 Episode Num: 124 Episode T: 10 Reward: 9.100
Total T: 6502 Episode Num: 125 Episode T: 66 Reward: -6.600
Total T: 6568 Episode Num: 126 Episode T: 66 Reward: -6.600
Total T: 6634 Episode Num: 127 Episode T: 66 Reward: -6.600
Total T: 6697 Episode Num: 128 Episode T: 63 Reward: 3.800
Total T: 6763 Episode Num: 129 Episode T: 66 Reward: -6.600
Total T: 6781 Episode Num: 130 Episode T: 18 Reward: 8.300
Total T: 6840 Episode Num: 131 Episode T: 59 Reward: 4.200
Total T: 6906 Episode Num: 132 Episode T: 66 Reward: -6.600
Total T: 6912 Episode Num: 133 Episode T: 6 Reward: 9.500
Total T: 6924 Episode Num: 134 Episode T: 12 Reward: 8.900
Total T: 6941 Episode Num: 135 Episode T: 17 Reward: 8.400
recent Evaluation: -3.4800000000000404
Total T: 7007 Episode Num: 136 Episode T: 66 Reward: -6.600
Total T: 7008 Episode Num: 137 Episode T: 1 Reward: 10.000
Total T: 7074 Episode Num: 138 Episode T: 66 Reward: -6.600
Total T: 7140 Episode Num: 139 Episode T: 66 Reward: -6.600
Total T: 7206 Episode Num: 140 Episode T: 66 Reward: -6.600
Total T: 7220 Episode Num: 141 Episode T: 14 Reward: 8.700
Total T: 7286 Episode Num: 142 Episode T: 66 Reward: -6.600
Total T: 7352 Episode Num: 143 Episode T: 66 Reward: -6.600
Total T: 7418 Episode Num: 144 Episode T: 66 Reward: -6.600
Total T: 7484 Episode Num: 145 Episode T: 66 Reward: -6.600
Total T: 7550 Episode Num: 146 Episode T: 66 Reward: -6.600
Total T: 7616 Episode Num: 147 Episode T: 66 Reward: -6.600
Total T: 7682 Episode Num: 148 Episode T: 66 Reward: -6.600
Total T: 7700 Episode Num: 149 Episode T: 18 Reward: 8.300
Total T: 7716 Episode Num: 150 Episode T: 16 Reward: 8.500
Total T: 7727 Episode Num: 151 Episode T: 11 Reward: 9.000
Total T: 7740 Episode Num: 152 Episode T: 13 Reward: 8.800
Total T: 7806 Episode Num: 153 Episode T: 66 Reward: -6.600
Total T: 7872 Episode Num: 154 Episode T: 66 Reward: -6.600
Total T: 7896 Episode Num: 155 Episode T: 24 Reward: 7.700
Total T: 7962 Episode Num: 156 Episode T: 66 Reward: -6.600
Total T: 7965 Episode Num: 157 Episode T: 3 Reward: 9.800
Total T: 7980 Episode Num: 158 Episode T: 15 Reward: 8.600
recent Evaluation: -3.4300000000000175
Total T: 8046 Episode Num: 159 Episode T: 66 Reward: -6.600
Total T: 8060 Episode Num: 160 Episode T: 14 Reward: 8.700
Total T: 8126 Episode Num: 161 Episode T: 66 Reward: -6.600
Total T: 8192 Episode Num: 162 Episode T: 66 Reward: -6.600
Total T: 8258 Episode Num: 163 Episode T: 66 Reward: -6.600
Total T: 8324 Episode Num: 164 Episode T: 66 Reward: -6.600
Total T: 8390 Episode Num: 165 Episode T: 66 Reward: -6.600
Total T: 8456 Episode Num: 166 Episode T: 66 Reward: -6.600
Total T: 8522 Episode Num: 167 Episode T: 66 Reward: -6.600
Total T: 8588 Episode Num: 168 Episode T: 66 Reward: -6.600

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Total T: 8654 Episode Num: 169 Episode T: 66 Reward: -6.600  
Total T: 8720 Episode Num: 170 Episode T: 66 Reward: -6.600  
Total T: 8729 Episode Num: 171 Episode T: 9 Reward: 9.200  
Total T: 8746 Episode Num: 172 Episode T: 17 Reward: 8.400  
Total T: 8812 Episode Num: 173 Episode T: 66 Reward: -6.600  
Total T: 8813 Episode Num: 174 Episode T: 1 Reward: 10.000  
Total T: 8879 Episode Num: 175 Episode T: 66 Reward: -6.600  
Total T: 8945 Episode Num: 176 Episode T: 66 Reward: -6.600  
recent Evaluation: 1.08999999999995  
Total T: 9011 Episode Num: 177 Episode T: 66 Reward: -6.600  
Total T: 9077 Episode Num: 178 Episode T: 66 Reward: -6.600  
Total T: 9143 Episode Num: 179 Episode T: 66 Reward: -6.600  
Total T: 9209 Episode Num: 180 Episode T: 66 Reward: -6.600  
Total T: 9275 Episode Num: 181 Episode T: 66 Reward: -6.600  
Total T: 9341 Episode Num: 182 Episode T: 66 Reward: -6.600  
Total T: 9407 Episode Num: 183 Episode T: 66 Reward: -6.600  
Total T: 9412 Episode Num: 184 Episode T: 5 Reward: 9.600  
Total T: 9414 Episode Num: 185 Episode T: 2 Reward: 9.900  
Total T: 9423 Episode Num: 186 Episode T: 9 Reward: 9.200  
Total T: 9431 Episode Num: 187 Episode T: 8 Reward: 9.300  
Total T: 9447 Episode Num: 188 Episode T: 16 Reward: 8.500  
Total T: 9513 Episode Num: 189 Episode T: 66 Reward: -6.600  
Total T: 9579 Episode Num: 190 Episode T: 66 Reward: -6.600  
Total T: 9645 Episode Num: 191 Episode T: 66 Reward: -6.600  
Total T: 9711 Episode Num: 192 Episode T: 66 Reward: -6.600  
Total T: 9777 Episode Num: 193 Episode T: 66 Reward: -6.600  
Total T: 9796 Episode Num: 194 Episode T: 19 Reward: 8.200  
Total T: 9862 Episode Num: 195 Episode T: 66 Reward: -6.600  
Total T: 9928 Episode Num: 196 Episode T: 66 Reward: -6.600  
Total T: 9994 Episode Num: 197 Episode T: 66 Reward: -6.600  
recent Evaluation: -4.970000000000575  
Total T: 10010 Episode Num: 198 Episode T: 16 Reward: 8.500  
Total T: 10024 Episode Num: 199 Episode T: 14 Reward: 8.700  
Total T: 10090 Episode Num: 200 Episode T: 66 Reward: -6.600  
Total T: 10156 Episode Num: 201 Episode T: 66 Reward: -6.600  
Total T: 10222 Episode Num: 202 Episode T: 66 Reward: -6.600  
Total T: 10288 Episode Num: 203 Episode T: 66 Reward: -6.600  
Total T: 10291 Episode Num: 204 Episode T: 3 Reward: 9.800  
Total T: 10306 Episode Num: 205 Episode T: 15 Reward: 8.600  
Total T: 10324 Episode Num: 206 Episode T: 18 Reward: 8.300  
Total T: 10333 Episode Num: 207 Episode T: 9 Reward: 9.200  
Total T: 10399 Episode Num: 208 Episode T: 66 Reward: -6.600  
Total T: 10419 Episode Num: 209 Episode T: 20 Reward: 8.100  
Total T: 10485 Episode Num: 210 Episode T: 66 Reward: -6.600  
Total T: 10551 Episode Num: 211 Episode T: 66 Reward: -6.600  
Total T: 10567 Episode Num: 212 Episode T: 16 Reward: 8.500  
Total T: 10633 Episode Num: 213 Episode T: 66 Reward: -6.600  
Total T: 10641 Episode Num: 214 Episode T: 8 Reward: 9.300  
Total T: 10651 Episode Num: 215 Episode T: 10 Reward: 9.100  
Total T: 10663 Episode Num: 216 Episode T: 12 Reward: 8.900  
Total T: 10729 Episode Num: 217 Episode T: 66 Reward: -6.600  
Total T: 10795 Episode Num: 218 Episode T: 66 Reward: -6.600  
Total T: 10861 Episode Num: 219 Episode T: 66 Reward: -6.600  
Total T: 10927 Episode Num: 220 Episode T: 66 Reward: -6.600  
Total T: 10993 Episode Num: 221 Episode T: 66 Reward: -6.600  
recent Evaluation: -0.2899999999999526  
Total T: 11059 Episode Num: 222 Episode T: 66 Reward: -6.600  
Total T: 11069 Episode Num: 223 Episode T: 10 Reward: 9.100  
Total T: 11072 Episode Num: 224 Episode T: 3 Reward: 9.800  
Total T: 11138 Episode Num: 225 Episode T: 66 Reward: -6.600  
Total T: 11204 Episode Num: 226 Episode T: 66 Reward: -6.600  
Total T: 11270 Episode Num: 227 Episode T: 66 Reward: -6.600  
Total T: 11336 Episode Num: 228 Episode T: 66 Reward: -6.600  
Total T: 11402 Episode Num: 229 Episode T: 66 Reward: -6.600  
Total T: 11468 Episode Num: 230 Episode T: 66 Reward: -6.600  
Total T: 11483 Episode Num: 231 Episode T: 15 Reward: 8.600  
Total T: 11549 Episode Num: 232 Episode T: 66 Reward: -6.600  
Total T: 11558 Episode Num: 233 Episode T: 9 Reward: 9.200  
Total T: 11624 Episode Num: 234 Episode T: 66 Reward: -6.600  
Total T: 11636 Episode Num: 235 Episode T: 12 Reward: 8.900  
Total T: 11702 Episode Num: 236 Episode T: 66 Reward: -6.600  
Total T: 11768 Episode Num: 237 Episode T: 66 Reward: -6.600  
Total T: 11834 Episode Num: 238 Episode T: 66 Reward: -6.600  
Total T: 11837 Episode Num: 239 Episode T: 3 Reward: 9.800  
Total T: 11903 Episode Num: 240 Episode T: 66 Reward: -6.600  
Total T: 11969 Episode Num: 241 Episode T: 66 Reward: -6.600  
Total T: 11975 Episode Num: 242 Episode T: 6 Reward: 9.500  
recent Evaluation: -1.970000000000117  
Total T: 12041 Episode Num: 243 Episode T: 66 Reward: -6.600  
Total T: 12063 Episode Num: 244 Episode T: 22 Reward: 7.900  
Total T: 12129 Episode Num: 245 Episode T: 66 Reward: -6.600  
Total T: 12145 Episode Num: 246 Episode T: 16 Reward: 8.500  
Total T: 12160 Episode Num: 247 Episode T: 15 Reward: 8.600  
Total T: 12226 Episode Num: 248 Episode T: 66 Reward: -6.600  
Total T: 12241 Episode Num: 249 Episode T: 15 Reward: 8.600  
Total T: 12307 Episode Num: 250 Episode T: 66 Reward: -6.600  
Total T: 12373 Episode Num: 251 Episode T: 66 Reward: -6.600  
Total T: 12439 Episode Num: 252 Episode T: 66 Reward: -6.600  
Total T: 12505 Episode Num: 253 Episode T: 66 Reward: -6.600  
Total T: 12571 Episode Num: 254 Episode T: 66 Reward: -6.600  
Total T: 12637 Episode Num: 255 Episode T: 66 Reward: -6.600  
Total T: 12703 Episode Num: 256 Episode T: 66 Reward: -6.600  
Total T: 12769 Episode Num: 257 Episode T: 66 Reward: -6.600  
Total T: 12779 Episode Num: 258 Episode T: 10 Reward: 9.100  
Total T: 12845 Episode Num: 259 Episode T: 66 Reward: -6.600  
Total T: 12911 Episode Num: 260 Episode T: 66 Reward: -6.600  
Total T: 12921 Episode Num: 261 Episode T: 10 Reward: 9.100  
Total T: 12930 Episode Num: 262 Episode T: 9 Reward: 9.200  
Total T: 12945 Episode Num: 263 Episode T: 15 Reward: 8.600  
Total T: 12958 Episode Num: 264 Episode T: 13 Reward: 8.800  
recent Evaluation: -0.419999999999934  
Total T: 13024 Episode Num: 265 Episode T: 66 Reward: -6.600  
Total T: 13040 Episode Num: 266 Episode T: 16 Reward: 8.500  
Total T: 13106 Episode Num: 267 Episode T: 66 Reward: -6.600  
Total T: 13110 Episode Num: 268 Episode T: 4 Reward: 9.700  
Total T: 13176 Episode Num: 269 Episode T: 66 Reward: -6.600  
Total T: 13242 Episode Num: 270 Episode T: 66 Reward: -6.600  
Total T: 13261 Episode Num: 271 Episode T: 19 Reward: 8.200  
Total T: 13275 Episode Num: 272 Episode T: 14 Reward: 8.700  
Total T: 13341 Episode Num: 273 Episode T: 66 Reward: -6.600  
Total T: 13407 Episode Num: 274 Episode T: 66 Reward: -6.600  
Total T: 13473 Episode Num: 275 Episode T: 66 Reward: -6.600  
Total T: 13539 Episode Num: 276 Episode T: 66 Reward: -6.600  
Total T: 13605 Episode Num: 277 Episode T: 66 Reward: -6.600  
Total T: 13671 Episode Num: 278 Episode T: 66 Reward: -6.600  
Total T: 13686 Episode Num: 279 Episode T: 15 Reward: 8.600

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Total T: 13752 Episode Num: 280 Episode T: 66 Reward: -6.600
Total T: 13770 Episode Num: 281 Episode T: 18 Reward: 8.300
Total T: 13836 Episode Num: 282 Episode T: 66 Reward: -6.600
Total T: 13856 Episode Num: 283 Episode T: 20 Reward: 8.100
Total T: 13922 Episode Num: 284 Episode T: 66 Reward: -6.600
Total T: 13988 Episode Num: 285 Episode T: 66 Reward: -6.600
Total T: 13993 Episode Num: 286 Episode T: 5 Reward: 9.600
recent Evaluation: -1.929999999999993
Total T: 14059 Episode Num: 287 Episode T: 66 Reward: -6.600
Total T: 14125 Episode Num: 288 Episode T: 66 Reward: -6.600
Total T: 14191 Episode Num: 289 Episode T: 66 Reward: -6.600
Total T: 14205 Episode Num: 290 Episode T: 14 Reward: 8.700
Total T: 14271 Episode Num: 291 Episode T: 66 Reward: -6.600
Total T: 14337 Episode Num: 292 Episode T: 66 Reward: -6.600
Total T: 14354 Episode Num: 293 Episode T: 17 Reward: 8.400
Total T: 14420 Episode Num: 294 Episode T: 66 Reward: -6.600
Total T: 14486 Episode Num: 295 Episode T: 66 Reward: -6.600
Total T: 14552 Episode Num: 296 Episode T: 66 Reward: -6.600
Total T: 14618 Episode Num: 297 Episode T: 66 Reward: -6.600
Total T: 14627 Episode Num: 298 Episode T: 9 Reward: 9.200
Total T: 14693 Episode Num: 299 Episode T: 66 Reward: -6.600
Total T: 14759 Episode Num: 300 Episode T: 66 Reward: -6.600
Total T: 14825 Episode Num: 301 Episode T: 66 Reward: -6.600
Total T: 14891 Episode Num: 302 Episode T: 66 Reward: -6.600
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recent Evaluation: -5.070000000000059
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Total T: 35923 Episode Num: 663 Episode T: 66 Reward: -6.600
Total T: 35989 Episode Num: 664 Episode T: 66 Reward: -6.600
recent Evaluation: -6.600000000000053
Total T: 36055 Episode Num: 665 Episode T: 66 Reward: -6.600
Total T: 36121 Episode Num: 666 Episode T: 66 Reward: -6.600
Total T: 36187 Episode Num: 667 Episode T: 66 Reward: -6.600
Total T: 36253 Episode Num: 668 Episode T: 66 Reward: -6.600
Total T: 36319 Episode Num: 669 Episode T: 66 Reward: -6.600
Total T: 36385 Episode Num: 670 Episode T: 66 Reward: -6.600
Total T: 36451 Episode Num: 671 Episode T: 66 Reward: -6.600
Total T: 36517 Episode Num: 672 Episode T: 66 Reward: -6.600
Total T: 36583 Episode Num: 673 Episode T: 66 Reward: -6.600
Total T: 36649 Episode Num: 674 Episode T: 66 Reward: -6.600
Total T: 36665 Episode Num: 675 Episode T: 16 Reward: 8.500
Total T: 36731 Episode Num: 676 Episode T: 66 Reward: -6.600
Total T: 36797 Episode Num: 677 Episode T: 66 Reward: -6.600
Total T: 36863 Episode Num: 678 Episode T: 66 Reward: -6.600
Total T: 36929 Episode Num: 679 Episode T: 66 Reward: -6.600
Total T: 36995 Episode Num: 680 Episode T: 66 Reward: -6.600
recent Evaluation: -6.600000000000053
Total T: 37061 Episode Num: 681 Episode T: 66 Reward: -6.600
Total T: 37080 Episode Num: 682 Episode T: 19 Reward: 8.200
Total T: 37086 Episode Num: 683 Episode T: 6 Reward: 9.500
Total T: 37152 Episode Num: 684 Episode T: 66 Reward: -6.600
Total T: 37218 Episode Num: 685 Episode T: 66 Reward: -6.600
Total T: 37284 Episode Num: 686 Episode T: 66 Reward: -6.600
Total T: 37350 Episode Num: 687 Episode T: 66 Reward: -6.600
Total T: 37372 Episode Num: 688 Episode T: 22 Reward: 7.900
Total T: 37438 Episode Num: 689 Episode T: 66 Reward: -6.600
Total T: 37504 Episode Num: 690 Episode T: 66 Reward: -6.600
Total T: 37570 Episode Num: 691 Episode T: 66 Reward: -6.600
Total T: 37636 Episode Num: 692 Episode T: 66 Reward: -6.600
Total T: 37653 Episode Num: 693 Episode T: 17 Reward: 8.400
Total T: 37667 Episode Num: 694 Episode T: 14 Reward: 8.700
Total T: 37733 Episode Num: 695 Episode T: 66 Reward: -6.600
Total T: 37799 Episode Num: 696 Episode T: 66 Reward: -6.600
Total T: 37865 Episode Num: 697 Episode T: 66 Reward: -6.600
Total T: 37875 Episode Num: 698 Episode T: 10 Reward: 9.100
Total T: 37941 Episode Num: 699 Episode T: 66 Reward: -6.600
recent Evaluation: -6.600000000000053
Total T: 38007 Episode Num: 700 Episode T: 66 Reward: -6.600
Total T: 38073 Episode Num: 701 Episode T: 66 Reward: -6.600
Total T: 38139 Episode Num: 702 Episode T: 66 Reward: -6.600
Total T: 38205 Episode Num: 703 Episode T: 66 Reward: -6.600
Total T: 38219 Episode Num: 704 Episode T: 14 Reward: 8.700
Total T: 38232 Episode Num: 705 Episode T: 13 Reward: 8.800
Total T: 38298 Episode Num: 706 Episode T: 66 Reward: -6.600
Total T: 38364 Episode Num: 707 Episode T: 66 Reward: -6.600
Total T: 38430 Episode Num: 708 Episode T: 66 Reward: -6.600
Total T: 38494 Episode Num: 709 Episode T: 64 Reward: 3.700
Total T: 38560 Episode Num: 710 Episode T: 66 Reward: -6.600
Total T: 38591 Episode Num: 711 Episode T: 31 Reward: 7.000
Total T: 38608 Episode Num: 712 Episode T: 17 Reward: 8.400
Total T: 38674 Episode Num: 713 Episode T: 66 Reward: -6.600
Total T: 38697 Episode Num: 714 Episode T: 23 Reward: 7.800
Total T: 38763 Episode Num: 715 Episode T: 66 Reward: -6.600
Total T: 38808 Episode Num: 716 Episode T: 45 Reward: 5.600
Total T: 38868 Episode Num: 717 Episode T: 60 Reward: 4.100
Total T: 38934 Episode Num: 718 Episode T: 66 Reward: -6.600

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Total T: 38939 Episode Num: 719 Episode T: 5 Reward: 9.600
Total T: 38963 Episode Num: 720 Episode T: 24 Reward: 7.700
recent Evaluation: -0.4199999999999993
Total T: 39029 Episode Num: 721 Episode T: 66 Reward: -6.600
Total T: 39058 Episode Num: 722 Episode T: 29 Reward: 7.200
Total T: 39117 Episode Num: 723 Episode T: 59 Reward: 4.200
Total T: 39160 Episode Num: 724 Episode T: 43 Reward: 5.800
Total T: 39199 Episode Num: 725 Episode T: 39 Reward: 6.200
Total T: 39222 Episode Num: 726 Episode T: 23 Reward: 7.800
Total T: 39225 Episode Num: 727 Episode T: 3 Reward: 9.800
Total T: 39291 Episode Num: 728 Episode T: 66 Reward: -6.600
Total T: 39354 Episode Num: 729 Episode T: 63 Reward: 3.800
Total T: 39367 Episode Num: 730 Episode T: 13 Reward: 8.800
Total T: 39386 Episode Num: 731 Episode T: 19 Reward: 8.200
Total T: 39406 Episode Num: 732 Episode T: 20 Reward: 8.100
Total T: 39438 Episode Num: 733 Episode T: 32 Reward: 6.900
Total T: 39457 Episode Num: 734 Episode T: 19 Reward: 8.200
Total T: 39471 Episode Num: 735 Episode T: 14 Reward: 8.700
Total T: 39492 Episode Num: 736 Episode T: 21 Reward: 8.000
Total T: 39512 Episode Num: 737 Episode T: 20 Reward: 8.100
Total T: 39546 Episode Num: 738 Episode T: 34 Reward: 6.700
Total T: 39551 Episode Num: 739 Episode T: 5 Reward: 9.600
Total T: 39604 Episode Num: 740 Episode T: 53 Reward: 4.800
Total T: 39624 Episode Num: 741 Episode T: 20 Reward: 8.100
Total T: 39633 Episode Num: 742 Episode T: 9 Reward: 9.200
Total T: 39643 Episode Num: 743 Episode T: 10 Reward: 9.100
Total T: 39655 Episode Num: 744 Episode T: 12 Reward: 8.900
Total T: 39703 Episode Num: 745 Episode T: 48 Reward: 5.300
Total T: 39722 Episode Num: 746 Episode T: 19 Reward: 8.200
Total T: 39750 Episode Num: 747 Episode T: 28 Reward: 7.300
Total T: 39794 Episode Num: 748 Episode T: 44 Reward: 5.700
Total T: 39813 Episode Num: 749 Episode T: 19 Reward: 8.200
Total T: 39849 Episode Num: 750 Episode T: 36 Reward: 6.500
Total T: 39877 Episode Num: 751 Episode T: 28 Reward: 7.300
Total T: 39928 Episode Num: 752 Episode T: 51 Reward: 5.000
Total T: 39935 Episode Num: 753 Episode T: 7 Reward: 9.400
Total T: 39950 Episode Num: 754 Episode T: 15 Reward: 8.600
Total T: 39977 Episode Num: 755 Episode T: 27 Reward: 7.400
recent Evaluation: 8.650000000000001
Total T: 40004 Episode Num: 756 Episode T: 27 Reward: 7.400
Total T: 40033 Episode Num: 757 Episode T: 29 Reward: 7.200
Total T: 40049 Episode Num: 758 Episode T: 16 Reward: 8.500
Total T: 40090 Episode Num: 759 Episode T: 41 Reward: 6.000
Total T: 40125 Episode Num: 760 Episode T: 35 Reward: 6.600
Total T: 40143 Episode Num: 761 Episode T: 18 Reward: 8.300
Total T: 40164 Episode Num: 762 Episode T: 21 Reward: 8.000
Total T: 40192 Episode Num: 763 Episode T: 28 Reward: 7.300
Total T: 40231 Episode Num: 764 Episode T: 39 Reward: 6.200
Total T: 40246 Episode Num: 765 Episode T: 15 Reward: 8.600
Total T: 40287 Episode Num: 766 Episode T: 41 Reward: 6.000
Total T: 40326 Episode Num: 767 Episode T: 39 Reward: 6.200
Total T: 40336 Episode Num: 768 Episode T: 10 Reward: 9.100
Total T: 40364 Episode Num: 769 Episode T: 28 Reward: 7.300
Total T: 40383 Episode Num: 770 Episode T: 19 Reward: 8.200
Total T: 40399 Episode Num: 771 Episode T: 16 Reward: 8.500
Total T: 40421 Episode Num: 772 Episode T: 22 Reward: 7.900
Total T: 40459 Episode Num: 773 Episode T: 38 Reward: 6.300
Total T: 40474 Episode Num: 774 Episode T: 15 Reward: 8.600
Total T: 40488 Episode Num: 775 Episode T: 14 Reward: 8.700
Total T: 40498 Episode Num: 776 Episode T: 10 Reward: 9.100
Total T: 40504 Episode Num: 777 Episode T: 6 Reward: 9.500
Total T: 40532 Episode Num: 778 Episode T: 28 Reward: 7.300
Total T: 40544 Episode Num: 779 Episode T: 12 Reward: 8.900
Total T: 40560 Episode Num: 780 Episode T: 16 Reward: 8.500
Total T: 40620 Episode Num: 781 Episode T: 60 Reward: 4.100
Total T: 40675 Episode Num: 782 Episode T: 55 Reward: 4.600
Total T: 40741 Episode Num: 783 Episode T: 66 Reward: -6.600
Total T: 40749 Episode Num: 784 Episode T: 8 Reward: 9.300
Total T: 40796 Episode Num: 785 Episode T: 47 Reward: 5.400
Total T: 40810 Episode Num: 786 Episode T: 14 Reward: 8.700
Total T: 40822 Episode Num: 787 Episode T: 12 Reward: 8.900
Total T: 40840 Episode Num: 788 Episode T: 18 Reward: 8.300
Total T: 40854 Episode Num: 789 Episode T: 14 Reward: 8.700
Total T: 40885 Episode Num: 790 Episode T: 31 Reward: 7.000
Total T: 40904 Episode Num: 791 Episode T: 19 Reward: 8.200
Total T: 40911 Episode Num: 792 Episode T: 7 Reward: 9.400
Total T: 40942 Episode Num: 793 Episode T: 31 Reward: 7.000
Total T: 40969 Episode Num: 794 Episode T: 27 Reward: 7.400
Total T: 40978 Episode Num: 795 Episode T: 9 Reward: 9.200
recent Evaluation: 8.289999999999998
Total T: 41024 Episode Num: 796 Episode T: 46 Reward: 5.500
Total T: 41053 Episode Num: 797 Episode T: 29 Reward: 7.200
Total T: 41068 Episode Num: 798 Episode T: 15 Reward: 8.600
Total T: 41069 Episode Num: 799 Episode T: 1 Reward: 10.000
Total T: 41073 Episode Num: 800 Episode T: 4 Reward: 9.700
Total T: 41087 Episode Num: 801 Episode T: 14 Reward: 8.700
Total T: 41095 Episode Num: 802 Episode T: 8 Reward: 9.300
Total T: 41120 Episode Num: 803 Episode T: 25 Reward: 7.600
Total T: 41150 Episode Num: 804 Episode T: 30 Reward: 7.100
Total T: 41176 Episode Num: 805 Episode T: 26 Reward: 7.500
Total T: 41204 Episode Num: 806 Episode T: 28 Reward: 7.300
Total T: 41215 Episode Num: 807 Episode T: 11 Reward: 9.000
Total T: 41232 Episode Num: 808 Episode T: 17 Reward: 8.400
Total T: 41254 Episode Num: 809 Episode T: 22 Reward: 7.900
Total T: 41292 Episode Num: 810 Episode T: 38 Reward: 6.300
Total T: 41334 Episode Num: 811 Episode T: 42 Reward: 5.900
Total T: 41351 Episode Num: 812 Episode T: 17 Reward: 8.400
Total T: 41375 Episode Num: 813 Episode T: 24 Reward: 7.700
Total T: 41406 Episode Num: 814 Episode T: 31 Reward: 7.000
Total T: 41436 Episode Num: 815 Episode T: 30 Reward: 7.100
Total T: 41475 Episode Num: 816 Episode T: 39 Reward: 6.200
Total T: 41509 Episode Num: 817 Episode T: 34 Reward: 6.700
Total T: 41521 Episode Num: 818 Episode T: 12 Reward: 8.900
Total T: 41545 Episode Num: 819 Episode T: 24 Reward: 7.700
Total T: 41547 Episode Num: 820 Episode T: 2 Reward: 9.900
Total T: 41557 Episode Num: 821 Episode T: 10 Reward: 9.100
Total T: 41595 Episode Num: 822 Episode T: 38 Reward: 6.300
Total T: 41661 Episode Num: 823 Episode T: 66 Reward: -6.600
Total T: 41691 Episode Num: 824 Episode T: 30 Reward: 7.100
Total T: 41723 Episode Num: 825 Episode T: 32 Reward: 6.900
Total T: 41740 Episode Num: 826 Episode T: 17 Reward: 8.400
Total T: 41774 Episode Num: 827 Episode T: 34 Reward: 6.700
Total T: 41781 Episode Num: 828 Episode T: 7 Reward: 9.400
Total T: 41801 Episode Num: 829 Episode T: 20 Reward: 8.100
Total T: 41836 Episode Num: 830 Episode T: 35 Reward: 6.600
Total T: 41840 Episode Num: 831 Episode T: 4 Reward: 9.700

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Total T: 41877 Episode Num: 832 Episode T: 37 Reward: 6.400
Total T: 41902 Episode Num: 833 Episode T: 25 Reward: 7.600
Total T: 41934 Episode Num: 834 Episode T: 32 Reward: 6.900
Total T: 41944 Episode Num: 835 Episode T: 10 Reward: 9.100
Total T: 41973 Episode Num: 836 Episode T: 29 Reward: 7.200
Total T: 41988 Episode Num: 837 Episode T: 15 Reward: 8.600
recent Evaluation: 7.989999999999992
Total T: 42008 Episode Num: 838 Episode T: 20 Reward: 8.100
Total T: 42024 Episode Num: 839 Episode T: 16 Reward: 8.500
Total T: 42048 Episode Num: 840 Episode T: 24 Reward: 7.700
Total T: 42060 Episode Num: 841 Episode T: 12 Reward: 8.900
Total T: 42074 Episode Num: 842 Episode T: 14 Reward: 8.700
Total T: 42106 Episode Num: 843 Episode T: 32 Reward: 6.900
Total T: 42122 Episode Num: 844 Episode T: 16 Reward: 8.500
Total T: 42130 Episode Num: 845 Episode T: 8 Reward: 9.300
Total T: 42146 Episode Num: 846 Episode T: 16 Reward: 8.500
Total T: 42161 Episode Num: 847 Episode T: 15 Reward: 8.600
Total T: 42189 Episode Num: 848 Episode T: 28 Reward: 7.300
Total T: 42210 Episode Num: 849 Episode T: 21 Reward: 8.000
Total T: 42218 Episode Num: 850 Episode T: 8 Reward: 9.300
Total T: 42249 Episode Num: 851 Episode T: 31 Reward: 7.000
Total T: 42284 Episode Num: 852 Episode T: 35 Reward: 6.600
Total T: 42304 Episode Num: 853 Episode T: 20 Reward: 8.100
Total T: 42340 Episode Num: 854 Episode T: 36 Reward: 6.500
Total T: 42351 Episode Num: 855 Episode T: 11 Reward: 9.000
Total T: 42365 Episode Num: 856 Episode T: 14 Reward: 8.700
Total T: 42369 Episode Num: 857 Episode T: 4 Reward: 9.700
Total T: 42388 Episode Num: 858 Episode T: 19 Reward: 8.200
Total T: 42402 Episode Num: 859 Episode T: 14 Reward: 8.700
Total T: 42421 Episode Num: 860 Episode T: 19 Reward: 8.200
Total T: 42436 Episode Num: 861 Episode T: 15 Reward: 8.600
Total T: 42450 Episode Num: 862 Episode T: 14 Reward: 8.700
Total T: 42489 Episode Num: 863 Episode T: 39 Reward: 6.200
Total T: 42499 Episode Num: 864 Episode T: 10 Reward: 9.100
Total T: 42524 Episode Num: 865 Episode T: 25 Reward: 7.600
Total T: 42531 Episode Num: 866 Episode T: 7 Reward: 9.400
Total T: 42566 Episode Num: 867 Episode T: 35 Reward: 6.600
Total T: 42578 Episode Num: 868 Episode T: 12 Reward: 8.900
Total T: 42581 Episode Num: 869 Episode T: 3 Reward: 9.800
Total T: 42596 Episode Num: 870 Episode T: 15 Reward: 8.600
Total T: 42640 Episode Num: 871 Episode T: 44 Reward: 5.700
Total T: 42648 Episode Num: 872 Episode T: 8 Reward: 9.300
Total T: 42674 Episode Num: 873 Episode T: 26 Reward: 7.500
Total T: 42696 Episode Num: 874 Episode T: 22 Reward: 7.900
Total T: 42733 Episode Num: 875 Episode T: 37 Reward: 6.400
Total T: 42745 Episode Num: 876 Episode T: 12 Reward: 8.900
Total T: 42762 Episode Num: 877 Episode T: 17 Reward: 8.400
Total T: 42767 Episode Num: 878 Episode T: 5 Reward: 9.600
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Total T: 42846 Episode Num: 882 Episode T: 13 Reward: 8.800
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Total T: 42895 Episode Num: 884 Episode T: 17 Reward: 8.400
Total T: 42919 Episode Num: 885 Episode T: 24 Reward: 7.700
Total T: 42939 Episode Num: 886 Episode T: 20 Reward: 8.100
Total T: 42948 Episode Num: 887 Episode T: 9 Reward: 9.200
Total T: 42979 Episode Num: 888 Episode T: 31 Reward: 7.000
Total T: 42988 Episode Num: 889 Episode T: 9 Reward: 9.200
Total T: 42997 Episode Num: 890 Episode T: 9 Reward: 9.200
recent Evaluation: 8.430000000000005
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Total T: 43027 Episode Num: 892 Episode T: 21 Reward: 8.000
Total T: 43048 Episode Num: 893 Episode T: 21 Reward: 8.000
Total T: 43076 Episode Num: 894 Episode T: 28 Reward: 7.300
Total T: 43095 Episode Num: 895 Episode T: 19 Reward: 8.200
Total T: 43116 Episode Num: 896 Episode T: 21 Reward: 8.000
Total T: 43130 Episode Num: 897 Episode T: 14 Reward: 8.700
Total T: 43169 Episode Num: 898 Episode T: 39 Reward: 6.200
Total T: 43211 Episode Num: 899 Episode T: 42 Reward: 5.900
Total T: 43228 Episode Num: 900 Episode T: 17 Reward: 8.400
Total T: 43247 Episode Num: 901 Episode T: 19 Reward: 8.200
Total T: 43285 Episode Num: 902 Episode T: 38 Reward: 6.300
Total T: 43293 Episode Num: 903 Episode T: 8 Reward: 9.300
Total T: 43297 Episode Num: 904 Episode T: 4 Reward: 9.700
Total T: 43324 Episode Num: 905 Episode T: 27 Reward: 7.400
Total T: 43344 Episode Num: 906 Episode T: 20 Reward: 8.100
Total T: 43370 Episode Num: 907 Episode T: 26 Reward: 7.500
Total T: 43436 Episode Num: 908 Episode T: 66 Reward: -6.600
Total T: 43452 Episode Num: 909 Episode T: 16 Reward: 8.500
Total T: 43473 Episode Num: 910 Episode T: 21 Reward: 8.000
Total T: 43483 Episode Num: 911 Episode T: 10 Reward: 9.100
Total T: 43499 Episode Num: 912 Episode T: 16 Reward: 8.500
Total T: 43534 Episode Num: 913 Episode T: 35 Reward: 6.600
Total T: 43561 Episode Num: 914 Episode T: 27 Reward: 7.400
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Total T: 43636 Episode Num: 918 Episode T: 4 Reward: 9.700
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Total T: 43676 Episode Num: 920 Episode T: 15 Reward: 8.600
Total T: 43713 Episode Num: 921 Episode T: 37 Reward: 6.400
Total T: 43723 Episode Num: 922 Episode T: 10 Reward: 9.100
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Total T: 43791 Episode Num: 924 Episode T: 36 Reward: 6.500
Total T: 43816 Episode Num: 925 Episode T: 25 Reward: 7.600
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Total T: 43894 Episode Num: 927 Episode T: 65 Reward: 3.600
Total T: 43913 Episode Num: 928 Episode T: 19 Reward: 8.200
Total T: 43932 Episode Num: 929 Episode T: 19 Reward: 8.200
Total T: 43949 Episode Num: 930 Episode T: 17 Reward: 8.400
Total T: 43968 Episode Num: 931 Episode T: 19 Reward: 8.200
Total T: 43985 Episode Num: 932 Episode T: 17 Reward: 8.400
recent Evaluation: 5.9199999999999955
Total T: 44018 Episode Num: 933 Episode T: 33 Reward: 6.800
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Total T: 44060 Episode Num: 935 Episode T: 23 Reward: 7.800
Total T: 44062 Episode Num: 936 Episode T: 2 Reward: 9.900
Total T: 44106 Episode Num: 937 Episode T: 44 Reward: 5.700
Total T: 44129 Episode Num: 938 Episode T: 23 Reward: 7.800
Total T: 44145 Episode Num: 939 Episode T: 16 Reward: 8.500
Total T: 44211 Episode Num: 940 Episode T: 66 Reward: -6.600
Total T: 44249 Episode Num: 941 Episode T: 38 Reward: 6.300
Total T: 44267 Episode Num: 942 Episode T: 18 Reward: 8.300
Total T: 44280 Episode Num: 943 Episode T: 13 Reward: 8.800
Total T: 44302 Episode Num: 944 Episode T: 22 Reward: 7.900

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Total T: 44317 Episode Num: 945 Episode T: 15 Reward: 8.600  
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 Total T: 44346 Episode Num: 947 Episode T: 11 Reward: 9.000  
 Total T: 44379 Episode Num: 948 Episode T: 33 Reward: 6.800  
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 Total T: 44552 Episode Num: 956 Episode T: 18 Reward: 8.300  
 Total T: 44563 Episode Num: 957 Episode T: 11 Reward: 9.000  
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 Total T: 44631 Episode Num: 959 Episode T: 27 Reward: 7.400  
 Total T: 44643 Episode Num: 960 Episode T: 12 Reward: 8.900  
 Total T: 44652 Episode Num: 961 Episode T: 9 Reward: 9.200  
 Total T: 44667 Episode Num: 962 Episode T: 15 Reward: 8.600  
 Total T: 44718 Episode Num: 963 Episode T: 51 Reward: 5.000  
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 Total T: 44894 Episode Num: 974 Episode T: 18 Reward: 8.300  
 Total T: 44909 Episode Num: 975 Episode T: 15 Reward: 8.600  
 Total T: 44936 Episode Num: 976 Episode T: 27 Reward: 7.400  
 Total T: 44968 Episode Num: 977 Episode T: 32 Reward: 6.900  
 recent Evaluation: 8.220000000000001  
 Total T: 45003 Episode Num: 978 Episode T: 35 Reward: 6.600  
 Total T: 45010 Episode Num: 979 Episode T: 7 Reward: 9.400  
 Total T: 45030 Episode Num: 980 Episode T: 20 Reward: 8.100  
 Total T: 45096 Episode Num: 981 Episode T: 66 Reward: -6.600  
 Total T: 45147 Episode Num: 982 Episode T: 51 Reward: 5.000  
 Total T: 45166 Episode Num: 983 Episode T: 19 Reward: 8.200  
 Total T: 45232 Episode Num: 984 Episode T: 66 Reward: -6.600  
 Total T: 45298 Episode Num: 985 Episode T: 66 Reward: -6.600  
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 Total T: 45513 Episode Num: 991 Episode T: 25 Reward: 7.600  
 Total T: 45543 Episode Num: 992 Episode T: 30 Reward: 7.100  
 Total T: 45553 Episode Num: 993 Episode T: 10 Reward: 9.100  
 Total T: 45592 Episode Num: 994 Episode T: 39 Reward: 6.200  
 Total T: 45599 Episode Num: 995 Episode T: 7 Reward: 9.400  
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 Total T: 45658 Episode Num: 999 Episode T: 17 Reward: 8.400  
 Total T: 45672 Episode Num: 1000 Episode T: 14 Reward: 8.700  
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 Total T: 45712 Episode Num: 1002 Episode T: 23 Reward: 7.800  
 Total T: 45729 Episode Num: 1003 Episode T: 17 Reward: 8.400  
 Total T: 45769 Episode Num: 1004 Episode T: 40 Reward: 6.100  
 Total T: 45785 Episode Num: 1005 Episode T: 16 Reward: 8.500  
 Total T: 45809 Episode Num: 1006 Episode T: 24 Reward: 7.700  
 Total T: 45823 Episode Num: 1007 Episode T: 14 Reward: 8.700  
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 Total T: 46067 Episode Num: 1017 Episode T: 10 Reward: 9.100  
 Total T: 46121 Episode Num: 1018 Episode T: 54 Reward: 4.700  
 Total T: 46132 Episode Num: 1019 Episode T: 11 Reward: 9.000  
 Total T: 46146 Episode Num: 1020 Episode T: 14 Reward: 8.700  
 Total T: 46162 Episode Num: 1021 Episode T: 16 Reward: 8.500  
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 Total T: 46259 Episode Num: 1025 Episode T: 39 Reward: 6.200  
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 Total T: 46301 Episode Num: 1028 Episode T: 7 Reward: 9.400  
 Total T: 46328 Episode Num: 1029 Episode T: 27 Reward: 7.400  
 Total T: 46351 Episode Num: 1030 Episode T: 23 Reward: 7.800  
 Total T: 46371 Episode Num: 1031 Episode T: 20 Reward: 8.100  
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 Total T: 46924 Episode Num: 1051 Episode T: 51 Reward: 5.000  
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 Total T: 46993 Episode Num: 1053 Episode T: 37 Reward: 6.400  
 recent Evaluation: 5.8999999999999975  
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 Total T: 47101 Episode Num: 1056 Episode T: 66 Reward: -6.600  
 Total T: 47104 Episode Num: 1057 Episode T: 3 Reward: 9.800

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Total T: 47208 Episode Num: 1059 Episode T: 66 Reward: -6.600
Total T: 47241 Episode Num: 1060 Episode T: 33 Reward: 6.800
Total T: 47307 Episode Num: 1061 Episode T: 66 Reward: -6.600
Total T: 47342 Episode Num: 1062 Episode T: 35 Reward: 6.600
Total T: 47359 Episode Num: 1063 Episode T: 17 Reward: 8.400
Total T: 47371 Episode Num: 1064 Episode T: 12 Reward: 8.900
Total T: 47432 Episode Num: 1065 Episode T: 61 Reward: 4.000
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Total T: 47603 Episode Num: 1072 Episode T: 16 Reward: 8.500
Total T: 47669 Episode Num: 1073 Episode T: 66 Reward: -6.600
Total T: 47735 Episode Num: 1074 Episode T: 66 Reward: -6.600
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Total T: 47867 Episode Num: 1076 Episode T: 66 Reward: -6.600
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recent Evaluation: 8.210000000000012
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Total T: 48118 Episode Num: 1081 Episode T: 66 Reward: -6.600
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Total T: 48190 Episode Num: 1083 Episode T: 6 Reward: 9.500
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Total T: 48273 Episode Num: 1085 Episode T: 17 Reward: 8.400
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Total T: 48385 Episode Num: 1087 Episode T: 46 Reward: 5.500
Total T: 48451 Episode Num: 1088 Episode T: 66 Reward: -6.600
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Total T: 48856 Episode Num: 1095 Episode T: 9 Reward: 9.200
Total T: 48922 Episode Num: 1096 Episode T: 66 Reward: -6.600
Total T: 48988 Episode Num: 1097 Episode T: 66 Reward: -6.600
recent Evaluation: -5.020000000000058
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Total T: 49013 Episode Num: 1099 Episode T: 12 Reward: 8.900
Total T: 49079 Episode Num: 1100 Episode T: 66 Reward: -6.600
Total T: 49145 Episode Num: 1101 Episode T: 66 Reward: -6.600
Total T: 49211 Episode Num: 1102 Episode T: 66 Reward: -6.600
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Total T: 49295 Episode Num: 1104 Episode T: 66 Reward: -6.600
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Total T: 50184 Episode Num: 1121 Episode T: 11 Reward: 9.000
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Total T: 50316 Episode Num: 1123 Episode T: 66 Reward: -6.600
Total T: 50342 Episode Num: 1124 Episode T: 26 Reward: 7.500
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Total T: 50441 Episode Num: 1126 Episode T: 33 Reward: 6.800
Total T: 50507 Episode Num: 1127 Episode T: 66 Reward: -6.600
Total T: 50517 Episode Num: 1128 Episode T: 10 Reward: 9.100
Total T: 50529 Episode Num: 1129 Episode T: 12 Reward: 8.900
Total T: 50595 Episode Num: 1130 Episode T: 66 Reward: -6.600
Total T: 50608 Episode Num: 1131 Episode T: 13 Reward: 8.800
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Total T: 50689 Episode Num: 1133 Episode T: 66 Reward: -6.600
Total T: 50748 Episode Num: 1134 Episode T: 59 Reward: 4.200
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recent Evaluation: 1.9299999999999826
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Total T: 51502 Episode Num: 1156 Episode T: 29 Reward: 7.200
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Total T: 51581 Episode Num: 1158 Episode T: 27 Reward: 7.400
Total T: 51626 Episode Num: 1159 Episode T: 45 Reward: 5.600
Total T: 51646 Episode Num: 1160 Episode T: 20 Reward: 8.100
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Total T: 51685 Episode Num: 1162 Episode T: 16 Reward: 8.500
Total T: 51700 Episode Num: 1163 Episode T: 15 Reward: 8.600
Total T: 51743 Episode Num: 1164 Episode T: 43 Reward: 5.800
Total T: 51791 Episode Num: 1165 Episode T: 48 Reward: 5.300
Total T: 51826 Episode Num: 1166 Episode T: 35 Reward: 6.600
Total T: 51853 Episode Num: 1167 Episode T: 27 Reward: 7.400
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Total T: 51937 Episode Num: 1169 Episode T: 37 Reward: 6.400
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recent Evaluation: 7.059999999999979  
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Total T: 52082 Episode Num: 1175 Episode T: 23 Reward: 7.800  
Total T: 52112 Episode Num: 1176 Episode T: 30 Reward: 7.100  
Total T: 52127 Episode Num: 1177 Episode T: 15 Reward: 8.600  
Total T: 52158 Episode Num: 1178 Episode T: 31 Reward: 7.000  
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Total T: 52243 Episode Num: 1181 Episode T: 22 Reward: 7.900  
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Total T: 52296 Episode Num: 1183 Episode T: 12 Reward: 8.900  
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Total T: 52915 Episode Num: 1215 Episode T: 9 Reward: 9.200  
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recent Evaluation: 2.1799999999999664  
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Total T: 53113 Episode Num: 1221 Episode T: 33 Reward: 6.800  
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recent Evaluation: 8.130000000000004  
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recent Evaluation: 8.400000000000015
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recent Evaluation: 0.22000000000000677
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Total T: 56798 Episode Num: 1375 Episode T: 20 Reward: 8.100
Total T: 56831 Episode Num: 1376 Episode T: 33 Reward: 6.800
Total T: 56861 Episode Num: 1377 Episode T: 30 Reward: 7.100
Total T: 56886 Episode Num: 1378 Episode T: 25 Reward: 7.600
Total T: 56920 Episode Num: 1379 Episode T: 34 Reward: 6.700
Total T: 56946 Episode Num: 1380 Episode T: 26 Reward: 7.500
Total T: 56972 Episode Num: 1381 Episode T: 26 Reward: 7.500
recent Evaluation: -2.4700000000000357
Total T: 57012 Episode Num: 1382 Episode T: 40 Reward: 6.100
Total T: 57041 Episode Num: 1383 Episode T: 29 Reward: 7.200
Total T: 57062 Episode Num: 1384 Episode T: 21 Reward: 8.000
Total T: 57089 Episode Num: 1385 Episode T: 27 Reward: 7.400
Total T: 57109 Episode Num: 1386 Episode T: 20 Reward: 8.100
Total T: 57145 Episode Num: 1387 Episode T: 36 Reward: 6.500
Total T: 57160 Episode Num: 1388 Episode T: 15 Reward: 8.600
Total T: 57191 Episode Num: 1389 Episode T: 31 Reward: 7.000
Total T: 57208 Episode Num: 1390 Episode T: 17 Reward: 8.400
Total T: 57218 Episode Num: 1391 Episode T: 10 Reward: 9.100
Total T: 57249 Episode Num: 1392 Episode T: 31 Reward: 7.000
Total T: 57269 Episode Num: 1393 Episode T: 20 Reward: 8.100
Total T: 57290 Episode Num: 1394 Episode T: 21 Reward: 8.000
Total T: 57305 Episode Num: 1395 Episode T: 15 Reward: 8.600

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Total T: 57307 Episode Num: 1396 Episode T: 2 Reward: 9.900
Total T: 57339 Episode Num: 1397 Episode T: 32 Reward: 6.900
Total T: 57367 Episode Num: 1398 Episode T: 28 Reward: 7.300
Total T: 57402 Episode Num: 1399 Episode T: 35 Reward: 6.600
Total T: 57419 Episode Num: 1400 Episode T: 17 Reward: 8.400
Total T: 57430 Episode Num: 1401 Episode T: 11 Reward: 9.000
Total T: 57447 Episode Num: 1402 Episode T: 17 Reward: 8.400
Total T: 57482 Episode Num: 1403 Episode T: 35 Reward: 6.600
Total T: 57530 Episode Num: 1404 Episode T: 48 Reward: 5.300
Total T: 57539 Episode Num: 1405 Episode T: 9 Reward: 9.200
Total T: 57555 Episode Num: 1406 Episode T: 16 Reward: 8.500
Total T: 57586 Episode Num: 1407 Episode T: 31 Reward: 7.000
Total T: 57635 Episode Num: 1408 Episode T: 49 Reward: 5.200
Total T: 57641 Episode Num: 1409 Episode T: 6 Reward: 9.500
Total T: 57661 Episode Num: 1410 Episode T: 20 Reward: 8.100
Total T: 57671 Episode Num: 1411 Episode T: 10 Reward: 9.100
Total T: 57713 Episode Num: 1412 Episode T: 42 Reward: 5.900
Total T: 57745 Episode Num: 1413 Episode T: 32 Reward: 6.900
Total T: 57771 Episode Num: 1414 Episode T: 26 Reward: 7.500
Total T: 57789 Episode Num: 1415 Episode T: 18 Reward: 8.300
Total T: 57796 Episode Num: 1416 Episode T: 7 Reward: 9.400
Total T: 57841 Episode Num: 1417 Episode T: 45 Reward: 5.600
Total T: 57883 Episode Num: 1418 Episode T: 42 Reward: 5.900
Total T: 57900 Episode Num: 1419 Episode T: 17 Reward: 8.400
Total T: 57948 Episode Num: 1420 Episode T: 48 Reward: 5.300
Total T: 57986 Episode Num: 1421 Episode T: 38 Reward: 6.300
Total T: 57999 Episode Num: 1422 Episode T: 13 Reward: 8.800
recent Evaluation: -0.34000000000001324
Total T: 58021 Episode Num: 1423 Episode T: 22 Reward: 7.900
Total T: 58062 Episode Num: 1424 Episode T: 41 Reward: 6.000
Total T: 58078 Episode Num: 1425 Episode T: 16 Reward: 8.500
Total T: 58107 Episode Num: 1426 Episode T: 29 Reward: 7.200
Total T: 58120 Episode Num: 1427 Episode T: 13 Reward: 8.800
Total T: 58131 Episode Num: 1428 Episode T: 11 Reward: 9.000
Total T: 58164 Episode Num: 1429 Episode T: 33 Reward: 6.800
Total T: 58185 Episode Num: 1430 Episode T: 21 Reward: 8.000
Total T: 58202 Episode Num: 1431 Episode T: 17 Reward: 8.400
Total T: 58216 Episode Num: 1432 Episode T: 14 Reward: 8.700
Total T: 58231 Episode Num: 1433 Episode T: 15 Reward: 8.600
Total T: 58246 Episode Num: 1434 Episode T: 15 Reward: 8.600
Total T: 58258 Episode Num: 1435 Episode T: 12 Reward: 8.900
Total T: 58290 Episode Num: 1436 Episode T: 32 Reward: 6.900
Total T: 58323 Episode Num: 1437 Episode T: 33 Reward: 6.800
Total T: 58342 Episode Num: 1438 Episode T: 19 Reward: 8.200
Total T: 58362 Episode Num: 1439 Episode T: 20 Reward: 8.100
Total T: 58394 Episode Num: 1440 Episode T: 32 Reward: 6.900
Total T: 58411 Episode Num: 1441 Episode T: 17 Reward: 8.400
Total T: 58430 Episode Num: 1442 Episode T: 19 Reward: 8.200
Total T: 58453 Episode Num: 1443 Episode T: 23 Reward: 7.800
Total T: 58493 Episode Num: 1444 Episode T: 40 Reward: 6.100
Total T: 58537 Episode Num: 1445 Episode T: 44 Reward: 5.700
Total T: 58553 Episode Num: 1446 Episode T: 16 Reward: 8.500
Total T: 58560 Episode Num: 1447 Episode T: 7 Reward: 9.400
Total T: 58578 Episode Num: 1448 Episode T: 18 Reward: 8.300
Total T: 58585 Episode Num: 1449 Episode T: 7 Reward: 9.400
Total T: 58619 Episode Num: 1450 Episode T: 34 Reward: 6.700
Total T: 58642 Episode Num: 1451 Episode T: 23 Reward: 7.800
Total T: 58668 Episode Num: 1452 Episode T: 26 Reward: 7.500
Total T: 58682 Episode Num: 1453 Episode T: 14 Reward: 8.700
Total T: 58719 Episode Num: 1454 Episode T: 37 Reward: 6.400
Total T: 58733 Episode Num: 1455 Episode T: 14 Reward: 8.700
Total T: 58761 Episode Num: 1456 Episode T: 28 Reward: 7.300
Total T: 58778 Episode Num: 1457 Episode T: 17 Reward: 8.400
Total T: 58784 Episode Num: 1458 Episode T: 6 Reward: 9.500
Total T: 58829 Episode Num: 1459 Episode T: 45 Reward: 5.600
Total T: 58857 Episode Num: 1460 Episode T: 28 Reward: 7.300
Total T: 58868 Episode Num: 1461 Episode T: 11 Reward: 9.000
Total T: 58898 Episode Num: 1462 Episode T: 30 Reward: 7.100
Total T: 58915 Episode Num: 1463 Episode T: 17 Reward: 8.400
Total T: 58929 Episode Num: 1464 Episode T: 14 Reward: 8.700
Total T: 58941 Episode Num: 1465 Episode T: 12 Reward: 8.900
Total T: 58947 Episode Num: 1466 Episode T: 6 Reward: 9.500
Total T: 58968 Episode Num: 1467 Episode T: 21 Reward: 8.000
Total T: 58992 Episode Num: 1468 Episode T: 24 Reward: 7.700
recent Evaluation: 8.620000000000005
Total T: 59022 Episode Num: 1469 Episode T: 30 Reward: 7.100
Total T: 59032 Episode Num: 1470 Episode T: 10 Reward: 9.100
Total T: 59049 Episode Num: 1471 Episode T: 17 Reward: 8.400
Total T: 59067 Episode Num: 1472 Episode T: 18 Reward: 8.300
Total T: 59092 Episode Num: 1473 Episode T: 25 Reward: 7.600
Total T: 59120 Episode Num: 1474 Episode T: 28 Reward: 7.300
Total T: 59151 Episode Num: 1475 Episode T: 31 Reward: 7.000
Total T: 59164 Episode Num: 1476 Episode T: 13 Reward: 8.800
Total T: 59183 Episode Num: 1477 Episode T: 19 Reward: 8.200
Total T: 59230 Episode Num: 1478 Episode T: 47 Reward: 5.400
Total T: 59246 Episode Num: 1479 Episode T: 16 Reward: 8.500
Total T: 59264 Episode Num: 1480 Episode T: 18 Reward: 8.300
Total T: 59277 Episode Num: 1481 Episode T: 13 Reward: 8.800
Total T: 59287 Episode Num: 1482 Episode T: 10 Reward: 9.100
Total T: 59304 Episode Num: 1483 Episode T: 17 Reward: 8.400
Total T: 59338 Episode Num: 1484 Episode T: 34 Reward: 6.700
Total T: 59353 Episode Num: 1485 Episode T: 15 Reward: 8.600
Total T: 59379 Episode Num: 1486 Episode T: 26 Reward: 7.500
Total T: 59398 Episode Num: 1487 Episode T: 19 Reward: 8.200
Total T: 59419 Episode Num: 1488 Episode T: 21 Reward: 8.000
Total T: 59434 Episode Num: 1489 Episode T: 15 Reward: 8.600
Total T: 59449 Episode Num: 1490 Episode T: 15 Reward: 8.600
Total T: 59464 Episode Num: 1491 Episode T: 15 Reward: 8.600
Total T: 59484 Episode Num: 1492 Episode T: 20 Reward: 8.100
Total T: 59542 Episode Num: 1493 Episode T: 58 Reward: 4.300
Total T: 59580 Episode Num: 1494 Episode T: 38 Reward: 6.300
Total T: 59589 Episode Num: 1495 Episode T: 9 Reward: 9.200
Total T: 59595 Episode Num: 1496 Episode T: 6 Reward: 9.500
Total T: 59632 Episode Num: 1497 Episode T: 37 Reward: 6.400
Total T: 59633 Episode Num: 1498 Episode T: 1 Reward: 10.000
Total T: 59657 Episode Num: 1499 Episode T: 24 Reward: 7.700
Total T: 59690 Episode Num: 1500 Episode T: 33 Reward: 6.800
Total T: 59735 Episode Num: 1501 Episode T: 45 Reward: 5.600
Total T: 59763 Episode Num: 1502 Episode T: 28 Reward: 7.300
Total T: 59782 Episode Num: 1503 Episode T: 19 Reward: 8.200
Total T: 59805 Episode Num: 1504 Episode T: 23 Reward: 7.800
Total T: 59845 Episode Num: 1505 Episode T: 40 Reward: 6.100
Total T: 59881 Episode Num: 1506 Episode T: 36 Reward: 6.500
Total T: 59902 Episode Num: 1507 Episode T: 21 Reward: 8.000
Total T: 59928 Episode Num: 1508 Episode T: 26 Reward: 7.500
Total T: 59953 Episode Num: 1509 Episode T: 25 Reward: 7.600

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Total T: 59975 Episode Num: 1510 Episode T: 22 Reward: 7.900
recent Evaluation: 8.589999999999995
Total T: 60009 Episode Num: 1511 Episode T: 34 Reward: 6.700
Total T: 60027 Episode Num: 1512 Episode T: 18 Reward: 8.300
Total T: 60039 Episode Num: 1513 Episode T: 12 Reward: 8.900
Total T: 60057 Episode Num: 1514 Episode T: 18 Reward: 8.300
Total T: 60087 Episode Num: 1515 Episode T: 30 Reward: 7.100
Total T: 60097 Episode Num: 1516 Episode T: 10 Reward: 9.100
Total T: 60111 Episode Num: 1517 Episode T: 14 Reward: 8.700
Total T: 60143 Episode Num: 1518 Episode T: 32 Reward: 6.900
Total T: 60153 Episode Num: 1519 Episode T: 10 Reward: 9.100
Total T: 60169 Episode Num: 1520 Episode T: 16 Reward: 8.500
Total T: 60191 Episode Num: 1521 Episode T: 22 Reward: 7.900
Total T: 60209 Episode Num: 1522 Episode T: 18 Reward: 8.300
Total T: 60235 Episode Num: 1523 Episode T: 26 Reward: 7.500
Total T: 60250 Episode Num: 1524 Episode T: 15 Reward: 8.600
Total T: 60269 Episode Num: 1525 Episode T: 19 Reward: 8.200
Total T: 60278 Episode Num: 1526 Episode T: 9 Reward: 9.200
Total T: 60297 Episode Num: 1527 Episode T: 19 Reward: 8.200
Total T: 60329 Episode Num: 1528 Episode T: 32 Reward: 6.900
Total T: 60347 Episode Num: 1529 Episode T: 18 Reward: 8.300
Total T: 60387 Episode Num: 1530 Episode T: 40 Reward: 6.100
Total T: 60425 Episode Num: 1531 Episode T: 38 Reward: 6.300
Total T: 60454 Episode Num: 1532 Episode T: 29 Reward: 7.200
Total T: 60472 Episode Num: 1533 Episode T: 18 Reward: 8.300
Total T: 60492 Episode Num: 1534 Episode T: 20 Reward: 8.100
Total T: 60512 Episode Num: 1535 Episode T: 20 Reward: 8.100
Total T: 60560 Episode Num: 1536 Episode T: 48 Reward: 5.300
Total T: 60592 Episode Num: 1537 Episode T: 32 Reward: 6.900
Total T: 60626 Episode Num: 1538 Episode T: 34 Reward: 6.700
Total T: 60639 Episode Num: 1539 Episode T: 13 Reward: 8.800
Total T: 60648 Episode Num: 1540 Episode T: 9 Reward: 9.200
Total T: 60661 Episode Num: 1541 Episode T: 13 Reward: 8.800
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Total T: 60703 Episode Num: 1543 Episode T: 26 Reward: 7.500
Total T: 60721 Episode Num: 1544 Episode T: 18 Reward: 8.300
Total T: 60741 Episode Num: 1545 Episode T: 20 Reward: 8.100
Total T: 60758 Episode Num: 1546 Episode T: 17 Reward: 8.400
Total T: 60804 Episode Num: 1547 Episode T: 46 Reward: 5.500
Total T: 60817 Episode Num: 1548 Episode T: 13 Reward: 8.800
Total T: 60822 Episode Num: 1549 Episode T: 5 Reward: 9.600
Total T: 60836 Episode Num: 1550 Episode T: 14 Reward: 8.700
Total T: 60856 Episode Num: 1551 Episode T: 20 Reward: 8.100
Total T: 60895 Episode Num: 1552 Episode T: 39 Reward: 6.200
Total T: 60904 Episode Num: 1553 Episode T: 9 Reward: 9.200
Total T: 60915 Episode Num: 1554 Episode T: 11 Reward: 9.000
Total T: 60931 Episode Num: 1555 Episode T: 16 Reward: 8.500
Total T: 60961 Episode Num: 1556 Episode T: 30 Reward: 7.100
Total T: 60974 Episode Num: 1557 Episode T: 13 Reward: 8.800
Total T: 60992 Episode Num: 1558 Episode T: 18 Reward: 8.300
recent Evaluation: 9.020000000000003
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Total T: 61060 Episode Num: 1561 Episode T: 22 Reward: 7.900
Total T: 61086 Episode Num: 1562 Episode T: 26 Reward: 7.500
Total T: 61116 Episode Num: 1563 Episode T: 30 Reward: 7.100
Total T: 61136 Episode Num: 1564 Episode T: 20 Reward: 8.100
Total T: 61183 Episode Num: 1565 Episode T: 47 Reward: 5.400
Total T: 61200 Episode Num: 1566 Episode T: 17 Reward: 8.400
Total T: 61213 Episode Num: 1567 Episode T: 13 Reward: 8.800
Total T: 61217 Episode Num: 1568 Episode T: 4 Reward: 9.700
Total T: 61225 Episode Num: 1569 Episode T: 8 Reward: 9.300
Total T: 61241 Episode Num: 1570 Episode T: 16 Reward: 8.500
Total T: 61248 Episode Num: 1571 Episode T: 7 Reward: 9.400
Total T: 61266 Episode Num: 1572 Episode T: 18 Reward: 8.300
Total T: 61315 Episode Num: 1573 Episode T: 49 Reward: 5.200
Total T: 61334 Episode Num: 1574 Episode T: 19 Reward: 8.200
Total T: 61375 Episode Num: 1575 Episode T: 41 Reward: 6.000
Total T: 61384 Episode Num: 1576 Episode T: 9 Reward: 9.200
Total T: 61401 Episode Num: 1577 Episode T: 17 Reward: 8.400
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Total T: 61485 Episode Num: 1583 Episode T: 14 Reward: 8.700
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Total T: 61523 Episode Num: 1585 Episode T: 16 Reward: 8.500
Total T: 61540 Episode Num: 1586 Episode T: 17 Reward: 8.400
Total T: 61551 Episode Num: 1587 Episode T: 11 Reward: 9.000
Total T: 61569 Episode Num: 1588 Episode T: 18 Reward: 8.300
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Total T: 61605 Episode Num: 1590 Episode T: 5 Reward: 9.600
Total T: 61633 Episode Num: 1591 Episode T: 28 Reward: 7.300
Total T: 61642 Episode Num: 1592 Episode T: 9 Reward: 9.200
Total T: 61656 Episode Num: 1593 Episode T: 14 Reward: 8.700
Total T: 61682 Episode Num: 1594 Episode T: 26 Reward: 7.500
Total T: 61703 Episode Num: 1595 Episode T: 21 Reward: 8.000
Total T: 61717 Episode Num: 1596 Episode T: 14 Reward: 8.700
Total T: 61754 Episode Num: 1597 Episode T: 37 Reward: 6.400
Total T: 61786 Episode Num: 1598 Episode T: 32 Reward: 6.900
Total T: 61796 Episode Num: 1599 Episode T: 10 Reward: 9.100
Total T: 61817 Episode Num: 1600 Episode T: 21 Reward: 8.000
Total T: 61824 Episode Num: 1601 Episode T: 7 Reward: 9.400
Total T: 61829 Episode Num: 1602 Episode T: 5 Reward: 9.600
Total T: 61846 Episode Num: 1603 Episode T: 17 Reward: 8.400
Total T: 61879 Episode Num: 1604 Episode T: 33 Reward: 6.800
Total T: 61924 Episode Num: 1605 Episode T: 45 Reward: 5.600
Total T: 61933 Episode Num: 1606 Episode T: 9 Reward: 9.200
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Total T: 61974 Episode Num: 1608 Episode T: 24 Reward: 7.700
Total T: 61987 Episode Num: 1609 Episode T: 13 Reward: 8.800
recent Evaluation: 8.840000000000009
Total T: 62029 Episode Num: 1610 Episode T: 42 Reward: 5.900
Total T: 62045 Episode Num: 1611 Episode T: 16 Reward: 8.500
Total T: 62067 Episode Num: 1612 Episode T: 22 Reward: 7.900
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Total T: 62107 Episode Num: 1614 Episode T: 15 Reward: 8.600
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Total T: 62155 Episode Num: 1617 Episode T: 16 Reward: 8.500
Total T: 62178 Episode Num: 1618 Episode T: 23 Reward: 7.800
Total T: 62214 Episode Num: 1619 Episode T: 36 Reward: 6.500
Total T: 62236 Episode Num: 1620 Episode T: 22 Reward: 7.900
Total T: 62247 Episode Num: 1621 Episode T: 11 Reward: 9.000
Total T: 62284 Episode Num: 1622 Episode T: 37 Reward: 6.400

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Total T: 62296 Episode Num: 1623 Episode T: 12 Reward: 8.900
Total T: 62307 Episode Num: 1624 Episode T: 11 Reward: 9.000
Total T: 62335 Episode Num: 1625 Episode T: 28 Reward: 7.300
Total T: 62387 Episode Num: 1626 Episode T: 52 Reward: 4.900
Total T: 62415 Episode Num: 1627 Episode T: 28 Reward: 7.300
Total T: 62432 Episode Num: 1628 Episode T: 17 Reward: 8.400
Total T: 62443 Episode Num: 1629 Episode T: 11 Reward: 9.000
Total T: 62477 Episode Num: 1630 Episode T: 34 Reward: 6.700
Total T: 62485 Episode Num: 1631 Episode T: 8 Reward: 9.300
Total T: 62492 Episode Num: 1632 Episode T: 7 Reward: 9.400
Total T: 62507 Episode Num: 1633 Episode T: 15 Reward: 8.600
Total T: 62514 Episode Num: 1634 Episode T: 7 Reward: 9.400
Total T: 62549 Episode Num: 1635 Episode T: 35 Reward: 6.600
Total T: 62577 Episode Num: 1636 Episode T: 28 Reward: 7.300
Total T: 62580 Episode Num: 1637 Episode T: 3 Reward: 9.800
Total T: 62589 Episode Num: 1638 Episode T: 9 Reward: 9.200
Total T: 62603 Episode Num: 1639 Episode T: 14 Reward: 8.700
Total T: 62644 Episode Num: 1640 Episode T: 41 Reward: 6.000
Total T: 62673 Episode Num: 1641 Episode T: 29 Reward: 7.200
Total T: 62708 Episode Num: 1642 Episode T: 35 Reward: 6.600
Total T: 62724 Episode Num: 1643 Episode T: 16 Reward: 8.500
Total T: 62734 Episode Num: 1644 Episode T: 10 Reward: 9.100
Total T: 62773 Episode Num: 1645 Episode T: 39 Reward: 6.200
Total T: 62804 Episode Num: 1646 Episode T: 31 Reward: 7.000
Total T: 62827 Episode Num: 1647 Episode T: 23 Reward: 7.800
Total T: 62847 Episode Num: 1648 Episode T: 20 Reward: 8.100
Total T: 62856 Episode Num: 1649 Episode T: 9 Reward: 9.200
Total T: 62881 Episode Num: 1650 Episode T: 25 Reward: 7.600
Total T: 62908 Episode Num: 1651 Episode T: 27 Reward: 7.400
Total T: 62930 Episode Num: 1652 Episode T: 22 Reward: 7.900
Total T: 62971 Episode Num: 1653 Episode T: 41 Reward: 6.000
Total T: 62997 Episode Num: 1654 Episode T: 26 Reward: 7.500
recent Evaluation: 8.429999999999998
Total T: 63013 Episode Num: 1655 Episode T: 16 Reward: 8.500
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Total T: 63070 Episode Num: 1657 Episode T: 33 Reward: 6.800
Total T: 63099 Episode Num: 1658 Episode T: 29 Reward: 7.200
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Total T: 63150 Episode Num: 1661 Episode T: 13 Reward: 8.800
Total T: 63177 Episode Num: 1662 Episode T: 27 Reward: 7.400
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Total T: 63222 Episode Num: 1664 Episode T: 9 Reward: 9.200
Total T: 63248 Episode Num: 1665 Episode T: 26 Reward: 7.500
Total T: 63266 Episode Num: 1666 Episode T: 18 Reward: 8.300
Total T: 63287 Episode Num: 1667 Episode T: 21 Reward: 8.000
Total T: 63298 Episode Num: 1668 Episode T: 11 Reward: 9.000
Total T: 63320 Episode Num: 1669 Episode T: 22 Reward: 7.900
Total T: 63353 Episode Num: 1670 Episode T: 33 Reward: 6.800
Total T: 63374 Episode Num: 1671 Episode T: 21 Reward: 8.000
Total T: 63397 Episode Num: 1672 Episode T: 23 Reward: 7.800
Total T: 63430 Episode Num: 1673 Episode T: 33 Reward: 6.800
Total T: 63446 Episode Num: 1674 Episode T: 16 Reward: 8.500
Total T: 63452 Episode Num: 1675 Episode T: 6 Reward: 9.500
Total T: 63490 Episode Num: 1676 Episode T: 38 Reward: 6.300
Total T: 63524 Episode Num: 1677 Episode T: 34 Reward: 6.700
Total T: 63547 Episode Num: 1678 Episode T: 23 Reward: 7.800
Total T: 63565 Episode Num: 1679 Episode T: 18 Reward: 8.300
Total T: 63591 Episode Num: 1680 Episode T: 26 Reward: 7.500
Total T: 63608 Episode Num: 1681 Episode T: 17 Reward: 8.400
Total T: 63645 Episode Num: 1682 Episode T: 37 Reward: 6.400
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Total T: 63726 Episode Num: 1686 Episode T: 17 Reward: 8.400
Total T: 63740 Episode Num: 1687 Episode T: 14 Reward: 8.700
Total T: 63765 Episode Num: 1688 Episode T: 25 Reward: 7.600
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Total T: 63791 Episode Num: 1690 Episode T: 14 Reward: 8.700
Total T: 63807 Episode Num: 1691 Episode T: 16 Reward: 8.500
Total T: 63835 Episode Num: 1692 Episode T: 28 Reward: 7.300
Total T: 63880 Episode Num: 1693 Episode T: 45 Reward: 5.600
Total T: 63890 Episode Num: 1694 Episode T: 10 Reward: 9.100
Total T: 63918 Episode Num: 1695 Episode T: 28 Reward: 7.300
Total T: 63924 Episode Num: 1696 Episode T: 6 Reward: 9.500
Total T: 63947 Episode Num: 1697 Episode T: 23 Reward: 7.800
Total T: 63961 Episode Num: 1698 Episode T: 14 Reward: 8.700
Total T: 63979 Episode Num: 1699 Episode T: 18 Reward: 8.300
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recent Evaluation: -4.950000000000058
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Total T: 64029 Episode Num: 1702 Episode T: 11 Reward: 9.000
Total T: 64042 Episode Num: 1703 Episode T: 13 Reward: 8.800
Total T: 64073 Episode Num: 1704 Episode T: 31 Reward: 7.000
Total T: 64094 Episode Num: 1705 Episode T: 21 Reward: 8.000
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Total T: 64172 Episode Num: 1709 Episode T: 39 Reward: 6.200
Total T: 64195 Episode Num: 1710 Episode T: 23 Reward: 7.800
Total T: 64214 Episode Num: 1711 Episode T: 19 Reward: 8.200
Total T: 64220 Episode Num: 1712 Episode T: 6 Reward: 9.500
Total T: 64236 Episode Num: 1713 Episode T: 16 Reward: 8.500
Total T: 64265 Episode Num: 1714 Episode T: 29 Reward: 7.200
Total T: 64284 Episode Num: 1715 Episode T: 19 Reward: 8.200
Total T: 64306 Episode Num: 1716 Episode T: 22 Reward: 7.900
Total T: 64324 Episode Num: 1717 Episode T: 18 Reward: 8.300
Total T: 64328 Episode Num: 1718 Episode T: 4 Reward: 9.700
Total T: 64376 Episode Num: 1719 Episode T: 48 Reward: 5.300
Total T: 64393 Episode Num: 1720 Episode T: 17 Reward: 8.400
Total T: 64404 Episode Num: 1721 Episode T: 11 Reward: 9.000
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Total T: 64433 Episode Num: 1723 Episode T: 8 Reward: 9.300
Total T: 64442 Episode Num: 1724 Episode T: 9 Reward: 9.200
Total T: 64449 Episode Num: 1725 Episode T: 7 Reward: 9.400
Total T: 64454 Episode Num: 1726 Episode T: 5 Reward: 9.600
Total T: 64496 Episode Num: 1727 Episode T: 42 Reward: 5.900
Total T: 64520 Episode Num: 1728 Episode T: 24 Reward: 7.700
Total T: 64548 Episode Num: 1729 Episode T: 28 Reward: 7.300
Total T: 64564 Episode Num: 1730 Episode T: 16 Reward: 8.500
Total T: 64598 Episode Num: 1731 Episode T: 34 Reward: 6.700
Total T: 64649 Episode Num: 1732 Episode T: 51 Reward: 5.000
Total T: 64688 Episode Num: 1733 Episode T: 39 Reward: 6.200
Total T: 64702 Episode Num: 1734 Episode T: 14 Reward: 8.700
Total T: 64719 Episode Num: 1735 Episode T: 17 Reward: 8.400
Total T: 64738 Episode Num: 1736 Episode T: 19 Reward: 8.200

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Total T: 64755 Episode Num: 1737 Episode T: 17 Reward: 8.400  
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Total T: 64871 Episode Num: 1741 Episode T: 14 Reward: 8.700  
Total T: 64913 Episode Num: 1742 Episode T: 42 Reward: 5.900  
Total T: 64928 Episode Num: 1743 Episode T: 15 Reward: 8.600  
Total T: 64934 Episode Num: 1744 Episode T: 6 Reward: 9.500  
Total T: 64937 Episode Num: 1745 Episode T: 3 Reward: 9.800  
Total T: 64953 Episode Num: 1746 Episode T: 16 Reward: 8.500  
Total T: 64969 Episode Num: 1747 Episode T: 16 Reward: 8.500  
Total T: 64990 Episode Num: 1748 Episode T: 21 Reward: 8.000  
recent Evaluation: 8.3  
Total T: 65019 Episode Num: 1749 Episode T: 29 Reward: 7.200  
Total T: 65035 Episode Num: 1750 Episode T: 16 Reward: 8.500  
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Total T: 65240 Episode Num: 1760 Episode T: 20 Reward: 8.100  
Total T: 65260 Episode Num: 1761 Episode T: 20 Reward: 8.100  
Total T: 65277 Episode Num: 1762 Episode T: 17 Reward: 8.400  
Total T: 65314 Episode Num: 1763 Episode T: 37 Reward: 6.400  
Total T: 65357 Episode Num: 1764 Episode T: 43 Reward: 5.800  
Total T: 65388 Episode Num: 1765 Episode T: 31 Reward: 7.000  
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Total T: 65444 Episode Num: 1767 Episode T: 28 Reward: 7.300  
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Total T: 65518 Episode Num: 1770 Episode T: 17 Reward: 8.400  
Total T: 65561 Episode Num: 1771 Episode T: 43 Reward: 5.800  
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Total T: 65607 Episode Num: 1774 Episode T: 17 Reward: 8.400  
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Total T: 65922 Episode Num: 1789 Episode T: 11 Reward: 9.000  
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Total T: 65967 Episode Num: 1792 Episode T: 12 Reward: 8.900  
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recent Evaluation: 2.2399999999999996  
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Total T: 66075 Episode Num: 1799 Episode T: 17 Reward: 8.400  
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Total T: 66098 Episode Num: 1801 Episode T: 15 Reward: 8.600  
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Total T: 66383 Episode Num: 1816 Episode T: 10 Reward: 9.100  
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Total T: 66513 Episode Num: 1823 Episode T: 13 Reward: 8.800  
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recent Evaluation: 8.550000000000001  
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Total T: 67076 Episode Num: 1849 Episode T: 21 Reward: 8.000

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Total T: 67182 Episode Num: 1855 Episode T: 6 Reward: 9.500
Total T: 67199 Episode Num: 1856 Episode T: 17 Reward: 8.400
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Total T: 67233 Episode Num: 1858 Episode T: 18 Reward: 8.300
Total T: 67288 Episode Num: 1859 Episode T: 55 Reward: 4.600
Total T: 67322 Episode Num: 1860 Episode T: 34 Reward: 6.700
Total T: 67370 Episode Num: 1861 Episode T: 48 Reward: 5.300
Total T: 67402 Episode Num: 1862 Episode T: 32 Reward: 6.900
Total T: 67407 Episode Num: 1863 Episode T: 5 Reward: 9.600
Total T: 67424 Episode Num: 1864 Episode T: 17 Reward: 8.400
Total T: 67431 Episode Num: 1865 Episode T: 7 Reward: 9.400
Total T: 67449 Episode Num: 1866 Episode T: 18 Reward: 8.300
Total T: 67458 Episode Num: 1867 Episode T: 9 Reward: 9.200
Total T: 67477 Episode Num: 1868 Episode T: 19 Reward: 8.200
Total T: 67483 Episode Num: 1869 Episode T: 6 Reward: 9.500
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Total T: 67779 Episode Num: 1883 Episode T: 22 Reward: 7.900
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Total T: 67856 Episode Num: 1887 Episode T: 23 Reward: 7.800
Total T: 67872 Episode Num: 1888 Episode T: 16 Reward: 8.500
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Total T: 67926 Episode Num: 1890 Episode T: 29 Reward: 7.200
Total T: 67952 Episode Num: 1891 Episode T: 26 Reward: 7.500
Total T: 67982 Episode Num: 1892 Episode T: 30 Reward: 7.100
Total T: 67994 Episode Num: 1893 Episode T: 12 Reward: 8.900
recent Evaluation: 2.319999999999964
Total T: 68016 Episode Num: 1894 Episode T: 22 Reward: 7.900
Total T: 68026 Episode Num: 1895 Episode T: 10 Reward: 9.100
Total T: 68050 Episode Num: 1896 Episode T: 24 Reward: 7.700
Total T: 68055 Episode Num: 1897 Episode T: 5 Reward: 9.600
Total T: 68111 Episode Num: 1898 Episode T: 56 Reward: 4.500
Total T: 68120 Episode Num: 1899 Episode T: 9 Reward: 9.200
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Total T: 68565 Episode Num: 1916 Episode T: 10 Reward: 9.100
Total T: 68601 Episode Num: 1917 Episode T: 36 Reward: 6.500
Total T: 68634 Episode Num: 1918 Episode T: 33 Reward: 6.800
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Total T: 68841 Episode Num: 1926 Episode T: 41 Reward: 6.000
Total T: 68874 Episode Num: 1927 Episode T: 33 Reward: 6.800
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Total T: 68885 Episode Num: 1929 Episode T: 7 Reward: 9.400
Total T: 68897 Episode Num: 1930 Episode T: 12 Reward: 8.900
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Total T: 68957 Episode Num: 1932 Episode T: 22 Reward: 7.900
Total T: 68975 Episode Num: 1933 Episode T: 18 Reward: 8.300
recent Evaluation: 5.549999999999969
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Total T: 69128 Episode Num: 1940 Episode T: 15 Reward: 8.600
Total T: 69144 Episode Num: 1941 Episode T: 16 Reward: 8.500
Total T: 69156 Episode Num: 1942 Episode T: 12 Reward: 8.900
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Total T: 69454 Episode Num: 1956 Episode T: 26 Reward: 7.500
Total T: 69493 Episode Num: 1957 Episode T: 39 Reward: 6.200
Total T: 69518 Episode Num: 1958 Episode T: 25 Reward: 7.600
Total T: 69523 Episode Num: 1959 Episode T: 5 Reward: 9.600
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Total T: 69548 Episode Num: 1961 Episode T: 10 Reward: 9.100
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Total T: 69582 Episode Num: 1963 Episode T: 12 Reward: 8.900

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Total T: 69751 Episode Num: 1968 Episode T: 37 Reward: 6.400
Total T: 69763 Episode Num: 1969 Episode T: 12 Reward: 8.900
Total T: 69783 Episode Num: 1970 Episode T: 20 Reward: 8.100
Total T: 69795 Episode Num: 1971 Episode T: 12 Reward: 8.900
Total T: 69831 Episode Num: 1972 Episode T: 36 Reward: 6.500
Total T: 69865 Episode Num: 1973 Episode T: 34 Reward: 6.700
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Total T: 69936 Episode Num: 1976 Episode T: 15 Reward: 8.600
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recent Evaluation: 8.240000000000004
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Total T: 70638 Episode Num: 2006 Episode T: 17 Reward: 8.400
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recent Evaluation: 8.059999999999998
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recent Evaluation: -0.6299999999999994
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Total T: 72066 Episode Num: 2067 Episode T: 27 Reward: 7.400
Total T: 72079 Episode Num: 2068 Episode T: 13 Reward: 8.800
Total T: 72085 Episode Num: 2069 Episode T: 6 Reward: 9.500
Total T: 72105 Episode Num: 2070 Episode T: 20 Reward: 8.100
Total T: 72137 Episode Num: 2071 Episode T: 32 Reward: 6.900
Total T: 72162 Episode Num: 2072 Episode T: 25 Reward: 7.600
Total T: 72177 Episode Num: 2073 Episode T: 15 Reward: 8.600
Total T: 72192 Episode Num: 2074 Episode T: 15 Reward: 8.600
Total T: 72232 Episode Num: 2075 Episode T: 40 Reward: 6.100
Total T: 72244 Episode Num: 2076 Episode T: 12 Reward: 8.900

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Total T: 72281 Episode Num: 2077 Episode T: 37 Reward: 6.400
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Total T: 72367 Episode Num: 2080 Episode T: 25 Reward: 7.600
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Total T: 72465 Episode Num: 2085 Episode T: 43 Reward: 5.800
Total T: 72495 Episode Num: 2086 Episode T: 30 Reward: 7.100
Total T: 72515 Episode Num: 2087 Episode T: 20 Reward: 8.100
Total T: 72536 Episode Num: 2088 Episode T: 21 Reward: 8.000
Total T: 72549 Episode Num: 2089 Episode T: 13 Reward: 8.800
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Total T: 72589 Episode Num: 2091 Episode T: 5 Reward: 9.600
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Total T: 72641 Episode Num: 2094 Episode T: 35 Reward: 6.600
Total T: 72659 Episode Num: 2095 Episode T: 18 Reward: 8.300
Total T: 72691 Episode Num: 2096 Episode T: 32 Reward: 6.900
Total T: 72735 Episode Num: 2097 Episode T: 44 Reward: 5.700
Total T: 72747 Episode Num: 2098 Episode T: 12 Reward: 8.900
Total T: 72773 Episode Num: 2099 Episode T: 26 Reward: 7.500
Total T: 72803 Episode Num: 2100 Episode T: 30 Reward: 7.100
Total T: 72813 Episode Num: 2101 Episode T: 10 Reward: 9.100
Total T: 72849 Episode Num: 2102 Episode T: 36 Reward: 6.500
Total T: 72875 Episode Num: 2103 Episode T: 26 Reward: 7.500
Total T: 72904 Episode Num: 2104 Episode T: 29 Reward: 7.200
Total T: 72914 Episode Num: 2105 Episode T: 10 Reward: 9.100
Total T: 72926 Episode Num: 2106 Episode T: 12 Reward: 8.900
Total T: 72952 Episode Num: 2107 Episode T: 26 Reward: 7.500
Total T: 72982 Episode Num: 2108 Episode T: 30 Reward: 7.100
recent Evaluation: 7.9800000000000155
Total T: 73010 Episode Num: 2109 Episode T: 28 Reward: 7.300
Total T: 73015 Episode Num: 2110 Episode T: 5 Reward: 9.600
Total T: 73023 Episode Num: 2111 Episode T: 8 Reward: 9.300
Total T: 73042 Episode Num: 2112 Episode T: 19 Reward: 8.200
Total T: 73053 Episode Num: 2113 Episode T: 11 Reward: 9.000
Total T: 73073 Episode Num: 2114 Episode T: 20 Reward: 8.100
Total T: 73106 Episode Num: 2115 Episode T: 33 Reward: 6.800
Total T: 73134 Episode Num: 2116 Episode T: 28 Reward: 7.300
Total T: 73163 Episode Num: 2117 Episode T: 29 Reward: 7.200
Total T: 73180 Episode Num: 2118 Episode T: 17 Reward: 8.400
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Total T: 73228 Episode Num: 2120 Episode T: 13 Reward: 8.800
Total T: 73235 Episode Num: 2121 Episode T: 7 Reward: 9.400
Total T: 73237 Episode Num: 2122 Episode T: 2 Reward: 9.900
Total T: 73265 Episode Num: 2123 Episode T: 28 Reward: 7.300
Total T: 73313 Episode Num: 2124 Episode T: 48 Reward: 5.300
Total T: 73342 Episode Num: 2125 Episode T: 29 Reward: 7.200
Total T: 73378 Episode Num: 2126 Episode T: 36 Reward: 6.500
Total T: 73389 Episode Num: 2127 Episode T: 11 Reward: 9.000
Total T: 73423 Episode Num: 2128 Episode T: 34 Reward: 6.700
Total T: 73453 Episode Num: 2129 Episode T: 30 Reward: 7.100
Total T: 73457 Episode Num: 2130 Episode T: 4 Reward: 9.700
Total T: 73469 Episode Num: 2131 Episode T: 12 Reward: 8.900
Total T: 73475 Episode Num: 2132 Episode T: 6 Reward: 9.500
Total T: 73511 Episode Num: 2133 Episode T: 36 Reward: 6.500
Total T: 73554 Episode Num: 2134 Episode T: 43 Reward: 5.800
Total T: 73574 Episode Num: 2135 Episode T: 20 Reward: 8.100
Total T: 73592 Episode Num: 2136 Episode T: 18 Reward: 8.300
Total T: 73612 Episode Num: 2137 Episode T: 20 Reward: 8.100
Total T: 73643 Episode Num: 2138 Episode T: 31 Reward: 7.000
Total T: 73667 Episode Num: 2139 Episode T: 24 Reward: 7.700
Total T: 73698 Episode Num: 2140 Episode T: 31 Reward: 7.000
Total T: 73740 Episode Num: 2141 Episode T: 42 Reward: 5.900
Total T: 73759 Episode Num: 2142 Episode T: 19 Reward: 8.200
Total T: 73774 Episode Num: 2143 Episode T: 15 Reward: 8.600
Total T: 73803 Episode Num: 2144 Episode T: 29 Reward: 7.200
Total T: 73814 Episode Num: 2145 Episode T: 11 Reward: 9.000
Total T: 73843 Episode Num: 2146 Episode T: 29 Reward: 7.200
Total T: 73870 Episode Num: 2147 Episode T: 27 Reward: 7.400
Total T: 73880 Episode Num: 2148 Episode T: 10 Reward: 9.100
Total T: 73900 Episode Num: 2149 Episode T: 20 Reward: 8.100
Total T: 73925 Episode Num: 2150 Episode T: 25 Reward: 7.600
Total T: 73941 Episode Num: 2151 Episode T: 16 Reward: 8.500
Total T: 73949 Episode Num: 2152 Episode T: 8 Reward: 9.300
Total T: 73969 Episode Num: 2153 Episode T: 20 Reward: 8.100
Total T: 73984 Episode Num: 2154 Episode T: 15 Reward: 8.600
recent Evaluation: -0.5599999999999967
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Total T: 74020 Episode Num: 2156 Episode T: 12 Reward: 8.900
Total T: 74043 Episode Num: 2157 Episode T: 23 Reward: 7.800
Total T: 74066 Episode Num: 2158 Episode T: 23 Reward: 7.800
Total T: 74076 Episode Num: 2159 Episode T: 10 Reward: 9.100
Total T: 74079 Episode Num: 2160 Episode T: 3 Reward: 9.800
Total T: 74113 Episode Num: 2161 Episode T: 34 Reward: 6.700
Total T: 74127 Episode Num: 2162 Episode T: 14 Reward: 8.700
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Total T: 74167 Episode Num: 2164 Episode T: 11 Reward: 9.000
Total T: 74182 Episode Num: 2165 Episode T: 15 Reward: 8.600
Total T: 74200 Episode Num: 2166 Episode T: 18 Reward: 8.300
Total T: 74234 Episode Num: 2167 Episode T: 34 Reward: 6.700
Total T: 74241 Episode Num: 2168 Episode T: 7 Reward: 9.400
Total T: 74251 Episode Num: 2169 Episode T: 10 Reward: 9.100
Total T: 74298 Episode Num: 2170 Episode T: 47 Reward: 5.400
Total T: 74311 Episode Num: 2171 Episode T: 13 Reward: 8.800
Total T: 74317 Episode Num: 2172 Episode T: 6 Reward: 9.500
Total T: 74333 Episode Num: 2173 Episode T: 16 Reward: 8.500
Total T: 74371 Episode Num: 2174 Episode T: 38 Reward: 6.300
Total T: 74418 Episode Num: 2175 Episode T: 47 Reward: 5.400
Total T: 74424 Episode Num: 2176 Episode T: 6 Reward: 9.500
Total T: 74439 Episode Num: 2177 Episode T: 15 Reward: 8.600
Total T: 74453 Episode Num: 2178 Episode T: 14 Reward: 8.700
Total T: 74485 Episode Num: 2179 Episode T: 32 Reward: 6.900
Total T: 74499 Episode Num: 2180 Episode T: 14 Reward: 8.700
Total T: 74508 Episode Num: 2181 Episode T: 9 Reward: 9.200
Total T: 74515 Episode Num: 2182 Episode T: 7 Reward: 9.400
Total T: 74549 Episode Num: 2183 Episode T: 34 Reward: 6.700
Total T: 74551 Episode Num: 2184 Episode T: 2 Reward: 9.900
Total T: 74571 Episode Num: 2185 Episode T: 20 Reward: 8.100
Total T: 74583 Episode Num: 2186 Episode T: 12 Reward: 8.900
Total T: 74616 Episode Num: 2187 Episode T: 33 Reward: 6.800
Total T: 74631 Episode Num: 2188 Episode T: 15 Reward: 8.600
Total T: 74646 Episode Num: 2189 Episode T: 15 Reward: 8.600
Total T: 74679 Episode Num: 2190 Episode T: 33 Reward: 6.800

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Total T: 74710 Episode Num: 2191 Episode T: 31 Reward: 7.000
Total T: 74738 Episode Num: 2192 Episode T: 28 Reward: 7.300
Total T: 74748 Episode Num: 2193 Episode T: 10 Reward: 9.100
Total T: 74752 Episode Num: 2194 Episode T: 4 Reward: 9.700
Total T: 74772 Episode Num: 2195 Episode T: 20 Reward: 8.100
Total T: 74806 Episode Num: 2196 Episode T: 34 Reward: 6.700
Total T: 74823 Episode Num: 2197 Episode T: 17 Reward: 8.400
Total T: 74856 Episode Num: 2198 Episode T: 33 Reward: 6.800
Total T: 74865 Episode Num: 2199 Episode T: 9 Reward: 9.200
Total T: 74871 Episode Num: 2200 Episode T: 6 Reward: 9.500
Total T: 74898 Episode Num: 2201 Episode T: 27 Reward: 7.400
Total T: 74903 Episode Num: 2202 Episode T: 5 Reward: 9.600
Total T: 74921 Episode Num: 2203 Episode T: 18 Reward: 8.300
Total T: 74935 Episode Num: 2204 Episode T: 14 Reward: 8.700
Total T: 74966 Episode Num: 2205 Episode T: 31 Reward: 7.000
Total T: 74985 Episode Num: 2206 Episode T: 19 Reward: 8.200
recent Evaluation: 7.899999999999997
Total T: 75004 Episode Num: 2207 Episode T: 19 Reward: 8.200
Total T: 75018 Episode Num: 2208 Episode T: 14 Reward: 8.700
Total T: 75025 Episode Num: 2209 Episode T: 7 Reward: 9.400
Total T: 75060 Episode Num: 2210 Episode T: 35 Reward: 6.600
Total T: 75082 Episode Num: 2211 Episode T: 22 Reward: 7.900
Total T: 75100 Episode Num: 2212 Episode T: 18 Reward: 8.300
Total T: 75115 Episode Num: 2213 Episode T: 15 Reward: 8.600
Total T: 75148 Episode Num: 2214 Episode T: 33 Reward: 6.800
Total T: 75165 Episode Num: 2215 Episode T: 17 Reward: 8.400
Total T: 75193 Episode Num: 2216 Episode T: 28 Reward: 7.300
Total T: 75218 Episode Num: 2217 Episode T: 25 Reward: 7.600
Total T: 75238 Episode Num: 2218 Episode T: 20 Reward: 8.100
Total T: 75252 Episode Num: 2219 Episode T: 14 Reward: 8.700
Total T: 75269 Episode Num: 2220 Episode T: 17 Reward: 8.400
Total T: 75296 Episode Num: 2221 Episode T: 27 Reward: 7.400
Total T: 75319 Episode Num: 2222 Episode T: 23 Reward: 7.800
Total T: 75338 Episode Num: 2223 Episode T: 19 Reward: 8.200
Total T: 75375 Episode Num: 2224 Episode T: 37 Reward: 6.400
Total T: 75378 Episode Num: 2225 Episode T: 3 Reward: 9.800
Total T: 75432 Episode Num: 2226 Episode T: 54 Reward: 4.700
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Total T: 75479 Episode Num: 2228 Episode T: 39 Reward: 6.200
Total T: 75505 Episode Num: 2229 Episode T: 26 Reward: 7.500
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Total T: 75570 Episode Num: 2231 Episode T: 33 Reward: 6.800
Total T: 75597 Episode Num: 2232 Episode T: 27 Reward: 7.400
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Total T: 75628 Episode Num: 2234 Episode T: 14 Reward: 8.700
Total T: 75641 Episode Num: 2235 Episode T: 13 Reward: 8.800
Total T: 75675 Episode Num: 2236 Episode T: 34 Reward: 6.700
Total T: 75687 Episode Num: 2237 Episode T: 12 Reward: 8.900
Total T: 75721 Episode Num: 2238 Episode T: 34 Reward: 6.700
Total T: 75737 Episode Num: 2239 Episode T: 16 Reward: 8.500
Total T: 75763 Episode Num: 2240 Episode T: 26 Reward: 7.500
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Total T: 75799 Episode Num: 2242 Episode T: 18 Reward: 8.300
Total T: 75815 Episode Num: 2243 Episode T: 16 Reward: 8.500
Total T: 75833 Episode Num: 2244 Episode T: 18 Reward: 8.300
Total T: 75851 Episode Num: 2245 Episode T: 18 Reward: 8.300
Total T: 75857 Episode Num: 2246 Episode T: 6 Reward: 9.500
Total T: 75863 Episode Num: 2247 Episode T: 6 Reward: 9.500
Total T: 75895 Episode Num: 2248 Episode T: 32 Reward: 6.900
Total T: 75913 Episode Num: 2249 Episode T: 18 Reward: 8.300
Total T: 75935 Episode Num: 2250 Episode T: 22 Reward: 7.900
Total T: 75958 Episode Num: 2251 Episode T: 23 Reward: 7.800
Total T: 75972 Episode Num: 2252 Episode T: 14 Reward: 8.700
recent Evaluation: 5.7299999999999992
Total T: 76034 Episode Num: 2253 Episode T: 62 Reward: 3.900
Total T: 76041 Episode Num: 2254 Episode T: 7 Reward: 9.400
Total T: 76089 Episode Num: 2255 Episode T: 48 Reward: 5.300
Total T: 76129 Episode Num: 2256 Episode T: 40 Reward: 6.100
Total T: 76158 Episode Num: 2257 Episode T: 29 Reward: 7.200
Total T: 76170 Episode Num: 2258 Episode T: 12 Reward: 8.900
Total T: 76196 Episode Num: 2259 Episode T: 26 Reward: 7.500
Total T: 76216 Episode Num: 2260 Episode T: 20 Reward: 8.100
Total T: 76272 Episode Num: 2261 Episode T: 56 Reward: 4.500
Total T: 76313 Episode Num: 2262 Episode T: 41 Reward: 6.000
Total T: 76344 Episode Num: 2263 Episode T: 31 Reward: 7.000
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Total T: 76467 Episode Num: 2268 Episode T: 30 Reward: 7.100
Total T: 76485 Episode Num: 2269 Episode T: 18 Reward: 8.300
Total T: 76511 Episode Num: 2270 Episode T: 26 Reward: 7.500
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Total T: 76730 Episode Num: 2279 Episode T: 17 Reward: 8.400
Total T: 76742 Episode Num: 2280 Episode T: 12 Reward: 8.900
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Total T: 76768 Episode Num: 2282 Episode T: 12 Reward: 8.900
Total T: 76803 Episode Num: 2283 Episode T: 35 Reward: 6.600
Total T: 76841 Episode Num: 2284 Episode T: 38 Reward: 6.300
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Total T: 76920 Episode Num: 2287 Episode T: 17 Reward: 8.400
Total T: 76936 Episode Num: 2288 Episode T: 16 Reward: 8.500
Total T: 76967 Episode Num: 2289 Episode T: 31 Reward: 7.000
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recent Evaluation: 7.829999999999998
Total T: 77013 Episode Num: 2291 Episode T: 15 Reward: 8.600
Total T: 77046 Episode Num: 2292 Episode T: 33 Reward: 6.800
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Total T: 77078 Episode Num: 2294 Episode T: 12 Reward: 8.900
Total T: 77093 Episode Num: 2295 Episode T: 15 Reward: 8.600
Total T: 77107 Episode Num: 2296 Episode T: 14 Reward: 8.700
Total T: 77130 Episode Num: 2297 Episode T: 23 Reward: 7.800
Total T: 77158 Episode Num: 2298 Episode T: 28 Reward: 7.300
Total T: 77173 Episode Num: 2299 Episode T: 15 Reward: 8.600
Total T: 77203 Episode Num: 2300 Episode T: 30 Reward: 7.100
Total T: 77216 Episode Num: 2301 Episode T: 13 Reward: 8.800
Total T: 77225 Episode Num: 2302 Episode T: 9 Reward: 9.200
Total T: 77233 Episode Num: 2303 Episode T: 8 Reward: 9.300

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Total T: 77273 Episode Num: 2305 Episode T: 20 Reward: 8.100
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Total T: 77315 Episode Num: 2307 Episode T: 9 Reward: 9.200
Total T: 77345 Episode Num: 2308 Episode T: 30 Reward: 7.100
Total T: 77368 Episode Num: 2309 Episode T: 23 Reward: 7.800
Total T: 77403 Episode Num: 2310 Episode T: 35 Reward: 6.600
Total T: 77425 Episode Num: 2311 Episode T: 22 Reward: 7.900
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Total T: 77515 Episode Num: 2314 Episode T: 66 Reward: -6.600
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Total T: 77583 Episode Num: 2317 Episode T: 31 Reward: 7.000
Total T: 77595 Episode Num: 2318 Episode T: 12 Reward: 8.900
Total T: 77613 Episode Num: 2319 Episode T: 18 Reward: 8.300
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Total T: 77828 Episode Num: 2330 Episode T: 14 Reward: 8.700
Total T: 77838 Episode Num: 2331 Episode T: 10 Reward: 9.100
Total T: 77866 Episode Num: 2332 Episode T: 28 Reward: 7.300
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Total T: 77906 Episode Num: 2334 Episode T: 39 Reward: 6.200
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Total T: 77928 Episode Num: 2336 Episode T: 17 Reward: 8.400
Total T: 77950 Episode Num: 2337 Episode T: 22 Reward: 7.900
Total T: 77978 Episode Num: 2338 Episode T: 28 Reward: 7.300
recent Evaluation: -0.6199999999999991
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Total T: 78010 Episode Num: 2340 Episode T: 9 Reward: 9.200
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Total T: 78049 Episode Num: 2344 Episode T: 11 Reward: 9.000
Total T: 78066 Episode Num: 2345 Episode T: 17 Reward: 8.400
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Total T: 78134 Episode Num: 2348 Episode T: 29 Reward: 7.200
Total T: 78161 Episode Num: 2349 Episode T: 27 Reward: 7.400
Total T: 78179 Episode Num: 2350 Episode T: 18 Reward: 8.300
Total T: 78193 Episode Num: 2351 Episode T: 14 Reward: 8.700
Total T: 78210 Episode Num: 2352 Episode T: 17 Reward: 8.400
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Total T: 78367 Episode Num: 2360 Episode T: 19 Reward: 8.200
Total T: 78378 Episode Num: 2361 Episode T: 11 Reward: 9.000
Total T: 78404 Episode Num: 2362 Episode T: 26 Reward: 7.500
Total T: 78428 Episode Num: 2363 Episode T: 24 Reward: 7.700
Total T: 78460 Episode Num: 2364 Episode T: 32 Reward: 6.900
Total T: 78475 Episode Num: 2365 Episode T: 15 Reward: 8.600
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Total T: 78513 Episode Num: 2367 Episode T: 18 Reward: 8.300
Total T: 78530 Episode Num: 2368 Episode T: 17 Reward: 8.400
Total T: 78549 Episode Num: 2369 Episode T: 19 Reward: 8.200
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Total T: 78575 Episode Num: 2371 Episode T: 11 Reward: 9.000
Total T: 78595 Episode Num: 2372 Episode T: 20 Reward: 8.100
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Total T: 78840 Episode Num: 2382 Episode T: 25 Reward: 7.600
Total T: 78843 Episode Num: 2383 Episode T: 3 Reward: 9.800
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Total T: 78887 Episode Num: 2385 Episode T: 19 Reward: 8.200
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Total T: 78962 Episode Num: 2389 Episode T: 3 Reward: 9.800
Total T: 78982 Episode Num: 2390 Episode T: 20 Reward: 8.100
Total T: 78998 Episode Num: 2391 Episode T: 16 Reward: 8.500
recent Evaluation: 8.590000000000003
Total T: 79030 Episode Num: 2392 Episode T: 32 Reward: 6.900
Total T: 79038 Episode Num: 2393 Episode T: 8 Reward: 9.300
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Total T: 79079 Episode Num: 2395 Episode T: 12 Reward: 8.900
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Total T: 79127 Episode Num: 2397 Episode T: 22 Reward: 7.900
Total T: 79129 Episode Num: 2398 Episode T: 2 Reward: 9.900
Total T: 79149 Episode Num: 2399 Episode T: 20 Reward: 8.100
Total T: 79192 Episode Num: 2400 Episode T: 43 Reward: 5.800
Total T: 79205 Episode Num: 2401 Episode T: 13 Reward: 8.800
Total T: 79222 Episode Num: 2402 Episode T: 17 Reward: 8.400
Total T: 79263 Episode Num: 2403 Episode T: 41 Reward: 6.000
Total T: 79276 Episode Num: 2404 Episode T: 13 Reward: 8.800
Total T: 79305 Episode Num: 2405 Episode T: 29 Reward: 7.200
Total T: 79328 Episode Num: 2406 Episode T: 23 Reward: 7.800
Total T: 79352 Episode Num: 2407 Episode T: 24 Reward: 7.700
Total T: 79356 Episode Num: 2408 Episode T: 4 Reward: 9.700
Total T: 79368 Episode Num: 2409 Episode T: 12 Reward: 8.900
Total T: 79396 Episode Num: 2410 Episode T: 28 Reward: 7.300
Total T: 79413 Episode Num: 2411 Episode T: 17 Reward: 8.400
Total T: 79430 Episode Num: 2412 Episode T: 17 Reward: 8.400
Total T: 79442 Episode Num: 2413 Episode T: 12 Reward: 8.900
Total T: 79475 Episode Num: 2414 Episode T: 33 Reward: 6.800
Total T: 79493 Episode Num: 2415 Episode T: 18 Reward: 8.300
Total T: 79512 Episode Num: 2416 Episode T: 19 Reward: 8.200
Total T: 79534 Episode Num: 2417 Episode T: 22 Reward: 7.900

```

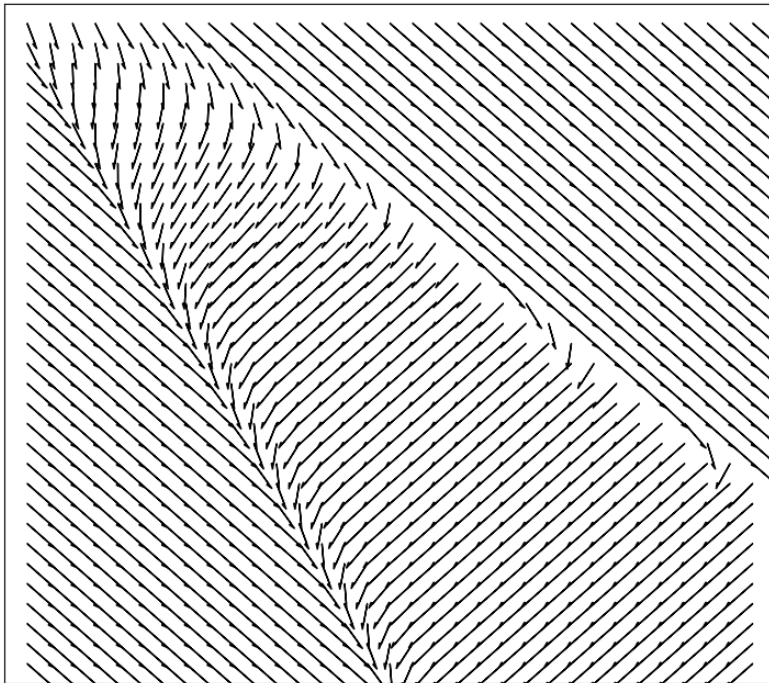
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Total T: 79565 Episode Num: 2418 Episode T: 31 Reward: 7.000
Total T: 79575 Episode Num: 2419 Episode T: 10 Reward: 9.100
Total T: 79587 Episode Num: 2420 Episode T: 12 Reward: 8.900
```

```
In [6]: %matplotlib notebook
# This section is used to visualize your learned policy
from torch import Tensor
output_i = np.zeros((33,33))
output_j = np.zeros((33,33))
output_i_m = np.zeros((33,33))
output_j_m = np.zeros((33,33))
value_ij = np.zeros((33,33))
value = 0
for i in range(33):
    for j in range(33):
        states = Tensor(np.asarray([i,j])).float().unsqueeze(0)

        '''
        you need to revise the following line,
        to fit your policy/network outputs
        '''

        action = policy.select_action(states)
        # action, value = policy(states)
        output_i[i,j] = action[0]
        output_j[i,j] = action[1]
        value_ij[i,j] = value

plt.figure(figsize=(5,5))
for i in range(33):
    for j in range(33):
        plt.arrow(j,-i,output_j[i,j],-output_i[i,j],head_width=0.2,shape='left')
xlim(-1,33)
ylim(-33,1)
yticks([2*i-32 for i in range(17)], [2*i for i in range(17)])
plt.xticks([])
plt.yticks([])
```



```
Out[6]: ([], [])
```

```
In [ ]:
```