

cartpole_dqn_ppo

January 11, 2021

1 Agent comparisson

This notebook is best used with Colab

Using stable baselines to compare DQN (vanilla, prioritized replay, dueling, double) with PPO.

- DQN: <https://stable-baselines.readthedocs.io/en/master/modules/dqn.html>
- PPO: <https://stable-baselines.readthedocs.io/en/master/modules/ppo2.html>

```
[1]: # Stable Baselines only supports tensorflow 1.x for now
%tensorflow_version 1.x

# Install dependencies
!apt-get install ffmpeg freeglut3-dev xvfb python-opengl >/dev/null
!pip install stable-baselines[mpi]==2.10.0 pyvirtualdisplay >/dev/null
```

TensorFlow 1.x selected.

```
[2]: import gym
import numpy as np

from stable_baselines import DQN, PP02
from stable_baselines.common.policies import MlpPolicy
from stable_baselines.common.evaluation import evaluate_policy
from stable_baselines.common.vec_env import VecVideoRecorder, DummyVecEnv
from stable_baselines.results_plotter import load_results, ts2xy
from stable_baselines import results_plotter

# For visuals
import matplotlib
%matplotlib inline
import os
import base64
import matplotlib.pyplot as plt
from pathlib import Path
from IPython import display as ipythondisplay
from pyvirtualdisplay import Display
```

```
# Disable annoying tf2 warnings
from warnings import simplefilter
simplefilter(action='ignore', category=FutureWarning)
```

WARNING:tensorflow:

The TensorFlow contrib module will not be included in TensorFlow 2.0.

For more information, please see:

* <https://github.com/tensorflow/community/blob/master/rfcs/20180907-contrib-sunset.md>

* <https://github.com/tensorflow/addons>

* <https://github.com/tensorflow/io> (for I/O related ops)

If you depend on functionality not listed there, please file an issue.

2 Setup video recording

```
[3]: # Taken from https://github.com/eleurent/highway-env

display = Display(visible=0, size=(1400, 900))
display.start()

def show_videos(video_path='', prefix=''):
    """
    :param video_path: (str) Path to the folder containing videos
    :param prefix: (str) Filter the video, showing only the only starting with
    ↪ this prefix
    """
    html = []
    for mp4 in Path(video_path).glob("{}*.mp4".format(prefix)):
        video_b64 = base64.b64encode(mp4.read_bytes())
        html.append('<<video alt="{}" autoplay
                    loop controls style="height: 400px;">
                    <source src="data:video/mp4;base64,{}" type="video/mp4" />
                    </video><<.format(mp4, video_b64.decode('ascii'))
    ipythondisplay.display(ipythondisplay.HTML(data="<br>".join(html)))

def record_video(env_id, model, video_length=500, prefix='',
    ↪ video_folder='videos/'):
    """
    :param env_id: (str)
    :param model: (RL model)
    :param video_length: (int)
    :param prefix: (str)
    :param video_folder: (str)
    """
    eval_env = DummyVecEnv([lambda: gym.make(env_id)])
```

```

# Start the video at step=0 and record 500 steps
eval_env = VecVideoRecorder(eval_env, video_folder=video_folder,
                             record_video_trigger=lambda step: step == 0,
→video_length=video_length,
                             name_prefix=prefix)

obs = eval_env.reset()
for _ in range(video_length):
    action, _ = model.predict(obs)
    obs, _, _, _ = eval_env.step(action)

# Close the video recorder
eval_env.close()

```

3 Setup plots

```

[4]: # Taken from: https://stable-baselines.readthedocs.io/

def moving_average(values, window):
    """
    Smooth values by doing a moving average
    :param values: (numpy array)
    :param window: (int)
    :return: (numpy array)
    """
    weights = np.repeat(1.0, window) / window
    return np.convolve(values, weights, 'valid')

def plot_results(log_folder, title='Learning Curve'):
    """
    plot the results

    :param log_folder: (str) the save location of the results to plot
    :param title: (str) the title of the task to plot
    """
    x, y = ts2xy(load_results(log_folder), 'timesteps')
    y = moving_average(y, window=50)
    # Truncate x
    x = x[len(x) - len(y):]

    fig = plt.figure(title)
    plt.plot(x, y)
    plt.xlabel('Number of Timesteps')
    plt.ylabel('Rewards')
    plt.title(title + " Smoothed")

```

```
plt.show()
```

4 Setup the environment

```
[5]: # Create and wrap an the env
env = gym.make('CartPole-v1')
print("Environment spaces:", env.action_space, env.observation_space)
```

Environment spaces: Discrete(2) Box(-3.4028234663852886e+38, 3.4028234663852886e+38, (4,), float32)

5 Setup the models

```
[9]: # Hyperparameters from https://github.com/araffin/rl-baselines-zoo/blob/v1.6/
    ↪ hyperparams/dqn.yml
def model_dqn(kwarg):
    model = DQN('MlpPolicy', env,
                learning_starts=10000,
                learning_rate=1e-4,
                tensorboard_log='./logs',
                **kwarg,
                verbose=1)

    return model
```

```
[10]: # Deactivate all the DQN extensions to have the original version
kwarg_vanilla = {'double_q': False, 'prioritized_replay': False,
    ↪ 'policy_kwargs': dict(dueling=False)}

# Activate only the prioritized replay
kwarg_pr = {'double_q': False, 'prioritized_replay': True, 'policy_kwargs':
    ↪ dict(dueling=False)}

# Activate all extensions: PR, Double Q-Learning, Dueling
kwarg_all = {'double_q': True, 'prioritized_replay': True, 'policy_kwargs':
    ↪ dict(dueling=True)}
```

```
[ ]: mean_reward, std_reward = evaluate_policy(model_dqn(kwarg_vanilla), env,
    ↪ n_eval_episodes=100)
print(f"mean_reward_dqn: {mean_reward:.2f} +/- {std_reward:.2f}")
```

```
[14]: # Hyperparameters from https://github.com/araffin/rl-baselines-zoo/blob/v1.6/
    ↪ hyperparams/ppo2.yml
def model_ppo():
    model = PP2('MlpPolicy', env,
```

```

        n_steps=32,
        nminibatches=1,
        lam=0.8,
        gamma=0.98,
        noptepochs=20,
        ent_coef=0.0,
        tensorboard_log='./logs',
        verbose=1)
    return model

```

```

[ ]: mean_reward_ppo, std_reward_ppo = evaluate_policy(model_ppo(), env,
    ↪n_eval_episodes=100)
print(f"mean_reward_ppo: {mean_reward_ppo:.2f} +/- {std_reward_ppo:.2f}")

```

6 Train the models

this will take a while

6.0.1 DQN Vanilla

```

[16]: dqn_vanilla = model_dqn(kwargs_vanilla).learn(total_timesteps=100000,
    ↪tb_log_name='cartpole_dqn_vanilla')
dqn_vanilla.save('cartpole_dqn_vanilla')

```

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/stable_baselines/common/base_class.py:1143: The name tf.summary.FileWriter is deprecated. Please use tf.compat.v1.summary.FileWriter instead.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/stable_baselines/common/tf_util.py:322: The name tf.get_default_session is deprecated. Please use tf.compat.v1.get_default_session instead.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/stable_baselines/common/tf_util.py:502: The name tf.Summary is deprecated. Please use tf.compat.v1.Summary instead.

```

-----
| % time spent exploring | 78      |
| episodes               | 100     |
| mean 100 episode reward | 21.9    |
| steps                  | 2171    |
-----

```

```

-----
| % time spent exploring | 59      |
| episodes               | 200     |
| mean 100 episode reward | 19.7    |
-----

```

steps	4141	
-------	------	--

% time spent exploring	43	
episodes	300	
mean 100 episode reward	16.5	
steps	5789	

% time spent exploring	28	
episodes	400	
mean 100 episode reward	15	
steps	7285	

% time spent exploring	13	
episodes	500	
mean 100 episode reward	15.3	
steps	8814	

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/stable_baselines/deepq/dqn.py:283: The name tf.RunOptions is deprecated. Please use tf.compat.v1.RunOptions instead.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/stable_baselines/deepq/dqn.py:284: The name tf.RunMetadata is deprecated. Please use tf.compat.v1.RunMetadata instead.

% time spent exploring	2	
episodes	600	
mean 100 episode reward	14.1	
steps	10219	

% time spent exploring	2	
episodes	700	
mean 100 episode reward	9.6	
steps	11178	

% time spent exploring	2	
episodes	800	
mean 100 episode reward	9.4	
steps	12114	

% time spent exploring	2	
------------------------	---	--

episodes	900	
mean 100 episode reward	9.7	
steps	13081	

% time spent exploring	2	
episodes	1000	
mean 100 episode reward	9.4	
steps	14024	

% time spent exploring	2	
episodes	1100	
mean 100 episode reward	9.5	
steps	14971	

% time spent exploring	2	
episodes	1200	
mean 100 episode reward	9.7	
steps	15938	

% time spent exploring	2	
episodes	1300	
mean 100 episode reward	33.2	
steps	19254	

% time spent exploring	2	
episodes	1400	
mean 100 episode reward	114	
steps	30643	

% time spent exploring	2	
episodes	1500	
mean 100 episode reward	92.1	
steps	39852	

% time spent exploring	2	
episodes	1600	
mean 100 episode reward	163	
steps	56188	

% time spent exploring	2	

episodes	1700	
mean 100 episode reward	283	
steps	84530	

```
[17]: mean_reward_dqn_vanilla, std_reward_dqn_vanilla = evaluate_policy(dqn_vanilla,
    ↪env, n_eval_episodes=100)
print(f"mean_reward_dqn_vanilla: {mean_reward_dqn_vanilla:.2f} +/-
    ↪{std_reward_dqn_vanilla:.2f}")
```

mean_reward_dqn_vanilla: 264.19 +/- 6.26

```
[18]: record_video('CartPole-v1', dqn_vanilla, video_length=500, prefix='dqn-vanilla')
```

Saving video to /content/videos/dqn-vanilla-step-0-to-step-500.mp4

```
[19]: show_videos('videos', prefix='dqn-vanilla')
```

<IPython.core.display.HTML object>

6.0.2 DQN Prioritized Replay

```
[20]: dqn_pr = model_dqn(kwargs_pr).learn(total_timesteps=100000,
    ↪tb_log_name='cartpole_dqn_pr')
dqn_pr.save('cartpole_dqn_pr')
```

% time spent exploring	80	
episodes	100	
mean 100 episode reward	20.4	
steps	2017	

% time spent exploring	64	
episodes	200	
mean 100 episode reward	15.6	
steps	3576	

% time spent exploring	52	
episodes	300	
mean 100 episode reward	12.7	
steps	4843	

% time spent exploring	41	
episodes	400	
mean 100 episode reward	11.5	

steps	5996	

% time spent exploring	30	
episodes	500	
mean 100 episode reward	11.1	
steps	7105	

% time spent exploring	20	
episodes	600	
mean 100 episode reward	10.3	
steps	8138	

% time spent exploring	10	
episodes	700	
mean 100 episode reward	10.2	
steps	9154	

% time spent exploring	2	
episodes	800	
mean 100 episode reward	9.3	
steps	10086	

% time spent exploring	2	
episodes	900	
mean 100 episode reward	9.3	
steps	11013	

% time spent exploring	2	
episodes	1000	
mean 100 episode reward	9.5	
steps	11967	

% time spent exploring	2	
episodes	1100	
mean 100 episode reward	9.6	
steps	12924	

% time spent exploring	2	
episodes	1200	
mean 100 episode reward	11.3	

steps	14052	

% time spent exploring	2	
episodes	1300	
mean 100 episode reward	63.8	
steps	20427	

% time spent exploring	2	
episodes	1400	
mean 100 episode reward	115	
steps	31907	

% time spent exploring	2	
episodes	1500	
mean 100 episode reward	161	
steps	48045	

% time spent exploring	2	
episodes	1600	
mean 100 episode reward	154	
steps	63405	

% time spent exploring	2	
episodes	1700	
mean 100 episode reward	310	
steps	94361	

```
[21]: mean_reward_dqn_pr, std_reward_dqn_pr = evaluate_policy(dqn_pr, env,
    ↪n_eval_episodes=100)
print(f"mean_reward_dqn_pr: {mean_reward_dqn_pr:.2f} +/- {std_reward_dqn_pr:.
    ↪2f}")
```

mean_reward_dqn_pr: 490.29 +/- 67.97

```
[22]: record_video('CartPole-v1', dqn_pr, video_length=500, prefix='dqn-pr')
```

Saving video to /content/videos/dqn-pr-step-0-to-step-500.mp4

```
[23]: show_videos('videos', prefix='dqn-pr')
```

<IPython.core.display.HTML object>

6.0.3 DQN All

```
[24]: dqn_all = model_dqn(kwargs_all).learn(total_timesteps=100000,
      ↪tb_log_name='cartpole_dqn_all')
dqn_all.save('cartpole_dqn_all')
```

```
-----
| % time spent exploring | 79      |
| episodes               | 100     |
| mean 100 episode reward | 21.1    |
| steps                  | 2084    |
-----
```

```
-----
| % time spent exploring | 62      |
| episodes               | 200     |
| mean 100 episode reward | 17      |
| steps                  | 3784    |
-----
```

```
-----
| % time spent exploring | 48      |
| episodes               | 300     |
| mean 100 episode reward | 14.7    |
| steps                  | 5249    |
-----
```

```
-----
| % time spent exploring | 35      |
| episodes               | 400     |
| mean 100 episode reward | 13.1    |
| steps                  | 6556    |
-----
```

```
-----
| % time spent exploring | 23      |
| episodes               | 500     |
| mean 100 episode reward | 12.3    |
| steps                  | 7788    |
-----
```

```
-----
| % time spent exploring | 12      |
| episodes               | 600     |
| mean 100 episode reward | 11.2    |
| steps                  | 8912    |
-----
```

```
-----
| % time spent exploring | 2       |
| episodes               | 700     |
| mean 100 episode reward | 10.6    |
| steps                  | 9968    |
-----
```

% time spent exploring	2	
episodes	800	
mean 100 episode reward	9.4	
steps	10908	

% time spent exploring	2	
episodes	900	
mean 100 episode reward	9.7	
steps	11877	

% time spent exploring	2	
episodes	1000	
mean 100 episode reward	12.2	
steps	13096	

% time spent exploring	2	
episodes	1100	
mean 100 episode reward	88.1	
steps	21908	

% time spent exploring	2	
episodes	1200	
mean 100 episode reward	130	
steps	34890	

% time spent exploring	2	
episodes	1300	
mean 100 episode reward	161	
steps	50971	

% time spent exploring	2	
episodes	1400	
mean 100 episode reward	183	
steps	69250	

```
[25]: mean_reward_dqn_all, std_reward_dqn_all = evaluate_policy(dqn_all, env,
    ↪n_eval_episodes=100)
print(f"mean_reward_dqn_all: {mean_reward_dqn_all:.2f} +/- {std_reward_dqn_all:.
    ↪2f}")
```

```
mean_reward_dqn_all: 500.00 +/- 0.00
```

```
[26]: record_video('CartPole-v1', dqn_all, video_length=500, prefix='dqn-all')
```

```
Saving video to /content/videos/dqn-all-step-0-to-step-500.mp4
```

```
[27]: show_videos('videos', prefix='dqn-all')
```

```
<IPython.core.display.HTML object>
```

6.0.4 PPO

```
[28]: ppo = model_ppo().learn(total_timesteps=100000, tb_log_name='cartpole_ppo')
      ppo.save('cartpole_ppo')
```

Streaming output truncated to the last 5000 lines.

n_updates	2741	
policy_entropy	0.20307457	
policy_loss	-0.0027031596	
serial_timesteps	87712	
time_elapsed	489	
total_timesteps	87712	
value_loss	0.00021179202	

approxkl	0.0019387647	
clipfrac	0.01875	
explained_variance	0.775	
fps	185	
n_updates	2742	
policy_entropy	0.23566489	
policy_loss	-0.006227465	
serial_timesteps	87744	
time_elapsed	489	
total_timesteps	87744	
value_loss	0.00020038756	

approxkl	0.0012282701	
clipfrac	0.0125	
explained_variance	0.463	
fps	173	
n_updates	2743	
policy_entropy	0.24126267	
policy_loss	-0.0069240206	
serial_timesteps	87776	
time_elapsed	490	
total_timesteps	87776	

value_loss	2.0963822e-05	
------------	---------------	--

approxkl	0.0069042756	
clipfrac	0.0625	
explained_variance	0.989	
fps	185	
n_updates	2744	
policy_entropy	0.20877533	
policy_loss	-0.013629233	
serial_timesteps	87808	
time_elapsed	490	
total_timesteps	87808	
value_loss	2.2462824e-05	

approxkl	0.0016841006	
clipfrac	0.0234375	
explained_variance	0.319	
fps	162	
n_updates	2745	
policy_entropy	0.19974017	
policy_loss	-0.008507576	
serial_timesteps	87840	
time_elapsed	490	
total_timesteps	87840	
value_loss	0.00018484384	

approxkl	0.0050376207	
clipfrac	0.053125	
explained_variance	0.786	
fps	163	
n_updates	2746	
policy_entropy	0.24895963	
policy_loss	-0.013680978	
serial_timesteps	87872	
time_elapsed	490	
total_timesteps	87872	
value_loss	0.00020266356	

approxkl	0.0031028253	
clipfrac	0.05	
explained_variance	0.55	
fps	178	
n_updates	2747	
policy_entropy	0.23784712	

policy_loss	-0.0069826646	
serial_timesteps	87904	
time_elapsed	490	
total_timesteps	87904	
value_loss	2.2418768e-05	

approxkl	9.4521856e-05	
clipfrac	0.0	
explained_variance	-0.000467	
fps	156	
n_updates	2748	
policy_entropy	0.23963086	
policy_loss	0.0010691716	
serial_timesteps	87936	
time_elapsed	490	
total_timesteps	87936	
value_loss	82.72485	

approxkl	0.00031556393	
clipfrac	0.0	
explained_variance	-0.0639	
fps	155	
n_updates	2749	
policy_entropy	0.21851361	
policy_loss	-0.0017292898	
serial_timesteps	87968	
time_elapsed	491	
total_timesteps	87968	
value_loss	0.00053023954	

approxkl	0.008301173	
clipfrac	0.078125	
explained_variance	0.77	
fps	162	
n_updates	2750	
policy_entropy	0.23730576	
policy_loss	-0.017290836	
serial_timesteps	88000	
time_elapsed	491	
total_timesteps	88000	
value_loss	0.00028357407	

approxkl	0.0032391988	
clipfrac	0.0546875	

explained_variance	0.381	
fps	183	
n_updates	2751	
policy_entropy	0.24933505	
policy_loss	-0.015727963	
serial_timesteps	88032	
time_elapsed	491	
total_timesteps	88032	
value_loss	2.785805e-05	

approxkl	0.011805247	
clipfrac	0.1140625	
explained_variance	0.981	
fps	199	
n_updates	2752	
policy_entropy	0.21964204	
policy_loss	-0.0061608003	
serial_timesteps	88064	
time_elapsed	491	
total_timesteps	88064	
value_loss	9.69176e-05	

approxkl	0.0047574006	
clipfrac	0.0546875	
explained_variance	0.881	
fps	209	
n_updates	2753	
policy_entropy	0.24623764	
policy_loss	-0.008048414	
serial_timesteps	88096	
time_elapsed	491	
total_timesteps	88096	
value_loss	0.0004121493	

approxkl	0.0024480263	
clipfrac	0.0453125	
explained_variance	-0.436	
fps	193	
n_updates	2754	
policy_entropy	0.2563812	
policy_loss	-0.004538073	
serial_timesteps	88128	
time_elapsed	492	
total_timesteps	88128	
value_loss	6.9307614e-05	


```

-----
| approxkl          | 0.0017508299 |
| clipfrac          | 0.0296875    |
| explained_variance | 0.992         |
| fps               | 193           |
| n_updates          | 2755          |
| policy_entropy     | 0.29203016    |
| policy_loss        | -0.008285793  |
| serial_timesteps   | 88160         |
| time_elapsed       | 492           |
| total_timesteps    | 88160         |
| value_loss         | 5.2105565e-06 |
-----

```

```

-----
| approxkl          | 0.004345537   |
| clipfrac          | 0.0609375     |
| explained_variance | 0.903          |
| fps               | 208            |
| n_updates          | 2756           |
| policy_entropy     | 0.29890656    |
| policy_loss        | -0.01046748   |
| serial_timesteps   | 88192          |
| time_elapsed       | 492            |
| total_timesteps    | 88192          |
| value_loss         | 7.2992945e-05 |
-----

```

```

-----
| approxkl          | 0.0017946322  |
| clipfrac          | 0.0140625     |
| explained_variance | 0.421          |
| fps               | 190            |
| n_updates          | 2757           |
| policy_entropy     | 0.31421548    |
| policy_loss        | -0.0033547753 |
| serial_timesteps   | 88224          |
| time_elapsed       | 492            |
| total_timesteps    | 88224          |
| value_loss         | 2.7488368e-05 |
-----

```

```

-----
| approxkl          | 0.004083339   |
| clipfrac          | 0.0546875     |
| explained_variance | 0.977          |
| fps               | 186            |
| n_updates          | 2758           |
| policy_entropy     | 0.3122776     |
| policy_loss        | -0.013675161  |
-----

```

serial_timesteps	88256	
time_elapsed	492	
total_timesteps	88256	
value_loss	4.8898214e-06	

approxkl	0.0025419265	
clipfrac	0.034375	
explained_variance	-0.72	
fps	175	
n_updates	2759	
policy_entropy	0.28357524	
policy_loss	-0.0045154653	
serial_timesteps	88288	
time_elapsed	492	
total_timesteps	88288	
value_loss	1.3507231e-05	

approxkl	0.011202166	
clipfrac	0.1625	
explained_variance	0.802	
fps	181	
n_updates	2760	
policy_entropy	0.3122203	
policy_loss	-0.01965884	
serial_timesteps	88320	
time_elapsed	493	
total_timesteps	88320	
value_loss	3.0073687e-05	

approxkl	0.0032573198	
clipfrac	0.0265625	
explained_variance	0.916	
fps	205	
n_updates	2761	
policy_entropy	0.31581149	
policy_loss	-0.007844655	
serial_timesteps	88352	
time_elapsed	493	
total_timesteps	88352	
value_loss	2.4998121e-06	

approxkl	0.0025098	
clipfrac	0.03125	
explained_variance	-0.0683	

fps	196	
n_updates	2762	
policy_entropy	0.30292955	
policy_loss	-0.0036824227	
serial_timesteps	88384	
time_elapsed	493	
total_timesteps	88384	
value_loss	8.126565e-06	

approxkl	0.00043850587	
clipfrac	0.0	
explained_variance	0.000232	
fps	203	
n_updates	2763	
policy_entropy	0.3119898	
policy_loss	0.0055171186	
serial_timesteps	88416	
time_elapsed	493	
total_timesteps	88416	
value_loss	96.22023	

approxkl	0.0001502992	
clipfrac	0.0	
explained_variance	0.978	
fps	189	
n_updates	2764	
policy_entropy	0.28423136	
policy_loss	-0.00021746833	
serial_timesteps	88448	
time_elapsed	493	
total_timesteps	88448	
value_loss	6.778404e-05	

approxkl	0.006498111	
clipfrac	0.1	
explained_variance	0.348	
fps	195	
n_updates	2765	
policy_entropy	0.3307803	
policy_loss	-0.0071882876	
serial_timesteps	88480	
time_elapsed	493	
total_timesteps	88480	
value_loss	0.00033235317	

approxkl	0.0011587646	
clipfrac	0.015625	
explained_variance	-0.574	
fps	164	
n_updates	2766	
policy_entropy	0.31550932	
policy_loss	-0.005078136	
serial_timesteps	88512	
time_elapsed	494	
total_timesteps	88512	
value_loss	0.00023875071	

approxkl	0.0008324262	
clipfrac	0.0015625	
explained_variance	0.927	
fps	161	
n_updates	2767	
policy_entropy	0.33816394	
policy_loss	-0.0021736524	
serial_timesteps	88544	
time_elapsed	494	
total_timesteps	88544	
value_loss	8.549034e-05	

approxkl	0.0029190409	
clipfrac	0.0421875	
explained_variance	-0.888	
fps	170	
n_updates	2768	
policy_entropy	0.33818486	
policy_loss	-0.00230232	
serial_timesteps	88576	
time_elapsed	494	
total_timesteps	88576	
value_loss	0.00014257773	

approxkl	0.000888584	
clipfrac	0.0	
explained_variance	-1.02	
fps	154	
n_updates	2769	
policy_entropy	0.38115066	
policy_loss	-0.005843445	
serial_timesteps	88608	

time_elapsed	494	
total_timesteps	88608	
value_loss	0.00010901884	

approxkl	0.004226697	
clipfrac	0.06875	
explained_variance	0.939	
fps	160	
n_updates	2770	
policy_entropy	0.35624725	
policy_loss	-0.0020132838	
serial_timesteps	88640	
time_elapsed	494	
total_timesteps	88640	
value_loss	4.6575562e-05	

approxkl	0.00036495595	
clipfrac	0.00625	
explained_variance	0.146	
fps	165	
n_updates	2771	
policy_entropy	0.35060793	
policy_loss	-0.001569766	
serial_timesteps	88672	
time_elapsed	495	
total_timesteps	88672	
value_loss	8.067468e-05	

approxkl	0.0025290214	
clipfrac	0.0296875	
explained_variance	0.736	
fps	157	
n_updates	2772	
policy_entropy	0.38841432	
policy_loss	-0.013988818	
serial_timesteps	88704	
time_elapsed	495	
total_timesteps	88704	
value_loss	5.3429656e-05	

approxkl	0.004946986	
clipfrac	0.059375	
explained_variance	-4.13	
fps	164	

n_updates	2773	
policy_entropy	0.39105827	
policy_loss	-0.0033027101	
serial_timesteps	88736	
time_elapsed	495	
total_timesteps	88736	
value_loss	4.0165687e-05	

approxkl	0.002078583	
clipfrac	0.0140625	
explained_variance	-0.559	
fps	168	
n_updates	2774	
policy_entropy	0.38292214	
policy_loss	-0.009052498	
serial_timesteps	88768	
time_elapsed	495	
total_timesteps	88768	
value_loss	5.1115116e-05	

approxkl	0.0017696747	
clipfrac	0.0203125	
explained_variance	0.94	
fps	163	
n_updates	2775	
policy_entropy	0.39008206	
policy_loss	-0.005980023	
serial_timesteps	88800	
time_elapsed	495	
total_timesteps	88800	
value_loss	1.7690458e-05	

approxkl	0.010971082	
clipfrac	0.18125	
explained_variance	-0.352	
fps	165	
n_updates	2776	
policy_entropy	0.3403108	
policy_loss	-0.013526224	
serial_timesteps	88832	
time_elapsed	496	
total_timesteps	88832	
value_loss	3.5832127e-05	

approxkl	0.005329215	
clipfrac	0.084375	
explained_variance	0.473	
fps	167	
n_updates	2777	
policy_entropy	0.35305074	
policy_loss	-0.004712205	
serial_timesteps	88864	
time_elapsed	496	
total_timesteps	88864	
value_loss	1.321895e-05	

approxkl	0.0028036821	
clipfrac	0.021875	
explained_variance	0.921	
fps	154	
n_updates	2778	
policy_entropy	0.34099668	
policy_loss	-0.008921425	
serial_timesteps	88896	
time_elapsed	496	
total_timesteps	88896	
value_loss	1.0311438e-05	

approxkl	0.004290624	
clipfrac	0.0546875	
explained_variance	0.000792	
fps	160	
n_updates	2779	
policy_entropy	0.33714437	
policy_loss	-0.01651229	
serial_timesteps	88928	
time_elapsed	496	
total_timesteps	88928	
value_loss	95.676704	

approxkl	0.001999526	
clipfrac	0.021875	
explained_variance	-4.05	
fps	177	
n_updates	2780	
policy_entropy	0.31929308	
policy_loss	-0.009422754	
serial_timesteps	88960	
time_elapsed	496	

total_timesteps	88960	
value_loss	0.0019077819	

approxkl	0.0049580117	
clipfrac	0.0828125	
explained_variance	-1.02	
fps	156	
n_updates	2781	
policy_entropy	0.29547516	
policy_loss	-0.0033228504	
serial_timesteps	88992	
time_elapsed	496	
total_timesteps	88992	
value_loss	0.000527603	

approxkl	0.0066417954	
clipfrac	0.0828125	
explained_variance	0.935	
fps	164	
n_updates	2782	
policy_entropy	0.33376655	
policy_loss	-0.011242832	
serial_timesteps	89024	
time_elapsed	497	
total_timesteps	89024	
value_loss	9.749167e-05	

approxkl	0.0046175416	
clipfrac	0.0515625	
explained_variance	0.419	
fps	160	
n_updates	2783	
policy_entropy	0.3037015	
policy_loss	-0.003023366	
serial_timesteps	89056	
time_elapsed	497	
total_timesteps	89056	
value_loss	0.00013788472	

approxkl	0.0061115716	
clipfrac	0.1171875	
explained_variance	0.889	
fps	168	
n_updates	2784	

policy_entropy	0.3695228	
policy_loss	-0.018556684	
serial_timesteps	89088	
time_elapsed	497	
total_timesteps	89088	
value_loss	6.9619564e-05	

approxkl	0.0020275977	
clipfrac	0.0296875	
explained_variance	-0.274	
fps	201	
n_updates	2785	
policy_entropy	0.35961556	
policy_loss	-0.0003588333	
serial_timesteps	89120	
time_elapsed	497	
total_timesteps	89120	
value_loss	8.458522e-05	

approxkl	0.008691669	
clipfrac	0.128125	
explained_variance	-0.449	
fps	212	
n_updates	2786	
policy_entropy	0.3823458	
policy_loss	-0.0077883564	
serial_timesteps	89152	
time_elapsed	497	
total_timesteps	89152	
value_loss	6.315357e-05	

approxkl	0.00081350096	
clipfrac	0.0015625	
explained_variance	0.725	
fps	169	
n_updates	2787	
policy_entropy	0.42811808	
policy_loss	-0.006115996	
serial_timesteps	89184	
time_elapsed	498	
total_timesteps	89184	
value_loss	3.2218923e-05	

approxkl	0.0029559121	
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clipfrac	0.040625	
explained_variance	-0.78	
fps	181	
n_updates	2788	
policy_entropy	0.4487018	
policy_loss	-0.0026507755	
serial_timesteps	89216	
time_elapsed	498	
total_timesteps	89216	
value_loss	3.772349e-05	

approxkl	0.00651991	
clipfrac	0.13125	
explained_variance	0.159	
fps	171	
n_updates	2789	
policy_entropy	0.4039499	
policy_loss	-0.018307429	
serial_timesteps	89248	
time_elapsed	498	
total_timesteps	89248	
value_loss	4.916421e-05	

approxkl	0.0015422318	
clipfrac	0.0171875	
explained_variance	0.114	
fps	191	
n_updates	2790	
policy_entropy	0.36806834	
policy_loss	-0.0040718974	
serial_timesteps	89280	
time_elapsed	498	
total_timesteps	89280	
value_loss	3.0388459e-05	

approxkl	0.010706196	
clipfrac	0.1375	
explained_variance	0.804	
fps	169	
n_updates	2791	
policy_entropy	0.3860622	
policy_loss	-0.014515853	
serial_timesteps	89312	
time_elapsed	498	
total_timesteps	89312	

value_loss	1.9295616e-05	
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approxkl	0.0038354036	
clipfrac	0.0625	
explained_variance	-0.974	
fps	189	
n_updates	2792	
policy_entropy	0.39116752	
policy_loss	-0.0059175757	
serial_timesteps	89344	
time_elapsed	499	
total_timesteps	89344	
value_loss	2.9075842e-05	

approxkl	0.00029725666	
clipfrac	0.0	
explained_variance	0.296	
fps	201	
n_updates	2793	
policy_entropy	0.40499195	
policy_loss	-0.0017965056	
serial_timesteps	89376	
time_elapsed	499	
total_timesteps	89376	
value_loss	2.2372587e-05	

approxkl	0.0011371427	
clipfrac	0.0125	
explained_variance	0.00189	
fps	204	
n_updates	2794	
policy_entropy	0.3862881	
policy_loss	-0.0031457022	
serial_timesteps	89408	
time_elapsed	499	
total_timesteps	89408	
value_loss	95.88161	

approxkl	0.00050563243	
clipfrac	0.0	
explained_variance	0.86	
fps	193	
n_updates	2795	
policy_entropy	0.3289029	

policy_loss	-0.0011973989	
serial_timesteps	89440	
time_elapsed	499	
total_timesteps	89440	
value_loss	0.0004343241	

approxkl	0.0032796066	
clipfrac	0.0453125	
explained_variance	0.442	
fps	185	
n_updates	2796	
policy_entropy	0.32417908	
policy_loss	-0.0050654868	
serial_timesteps	89472	
time_elapsed	499	
total_timesteps	89472	
value_loss	0.00047070108	

approxkl	0.0019491517	
clipfrac	0.025	
explained_variance	0.914	
fps	191	
n_updates	2797	
policy_entropy	0.33998576	
policy_loss	-0.0031053093	
serial_timesteps	89504	
time_elapsed	499	
total_timesteps	89504	
value_loss	0.00012769974	

approxkl	0.008789025	
clipfrac	0.1203125	
explained_variance	-0.0392	
fps	206	
n_updates	2798	
policy_entropy	0.38321298	
policy_loss	-0.010487016	
serial_timesteps	89536	
time_elapsed	500	
total_timesteps	89536	
value_loss	0.0002685051	

approxkl	0.0018642936	
clipfrac	0.0296875	

explained_variance	-0.703	
fps	181	
n_updates	2799	
policy_entropy	0.3955583	
policy_loss	-0.0058540413	
serial_timesteps	89568	
time_elapsed	500	
total_timesteps	89568	
value_loss	0.0001924313	

approxkl	0.004714079	
clipfrac	0.040625	
explained_variance	0.908	
fps	173	
n_updates	2800	
policy_entropy	0.33689675	
policy_loss	-0.010353558	
serial_timesteps	89600	
time_elapsed	500	
total_timesteps	89600	
value_loss	6.642734e-05	

approxkl	0.006944829	
clipfrac	0.084375	
explained_variance	0.692	
fps	190	
n_updates	2801	
policy_entropy	0.32768306	
policy_loss	-0.012950987	
serial_timesteps	89632	
time_elapsed	500	
total_timesteps	89632	
value_loss	0.00023564433	

approxkl	0.0029986866	
clipfrac	0.01875	
explained_variance	0.895	
fps	171	
n_updates	2802	
policy_entropy	0.34972984	
policy_loss	-0.016292576	
serial_timesteps	89664	
time_elapsed	500	
total_timesteps	89664	
value_loss	4.712895e-05	

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| approxkl          | 0.005551065 |
| clipfrac          | 0.09375      |
| explained_variance | -0.663        |
| fps               | 198           |
| n_updates          | 2803          |
| policy_entropy     | 0.31659427    |
| policy_loss        | -0.002255663  |
| serial_timesteps   | 89696         |
| time_elapsed       | 500           |
| total_timesteps    | 89696         |
| value_loss         | 0.00016385781 |
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| approxkl          | 0.004745025   |
| clipfrac          | 0.0671875     |
| explained_variance | 0.613          |
| fps               | 201            |
| n_updates          | 2804           |
| policy_entropy     | 0.30292934    |
| policy_loss        | -0.013369379  |
| serial_timesteps   | 89728          |
| time_elapsed       | 501            |
| total_timesteps    | 89728          |
| value_loss         | 0.00015063577 |
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| approxkl          | 0.00313719    |
| clipfrac          | 0.0578125     |
| explained_variance | 0.894          |
| fps               | 155            |
| n_updates          | 2805           |
| policy_entropy     | 0.29265526    |
| policy_loss        | -0.0090369815 |
| serial_timesteps   | 89760          |
| time_elapsed       | 501            |
| total_timesteps    | 89760          |
| value_loss         | 4.4150784e-05 |
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| approxkl          | 0.006274736   |
| clipfrac          | 0.071875      |
| explained_variance | -0.241         |
| fps               | 210            |
| n_updates          | 2806           |
| policy_entropy     | 0.28417224    |
| policy_loss        | -0.011085294  |

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serial_timesteps	89792	
time_elapsed	501	
total_timesteps	89792	
value_loss	0.0005459581	

approxkl	0.0012986574	
clipfrac	0.015625	
explained_variance	0.00337	
fps	188	
n_updates	2807	
policy_entropy	0.27993774	
policy_loss	-0.011006588	
serial_timesteps	89824	
time_elapsed	501	
total_timesteps	89824	
value_loss	90.55598	

approxkl	0.0059316466	
clipfrac	0.1125	
explained_variance	-0.437	
fps	169	
n_updates	2808	
policy_entropy	0.3165133	
policy_loss	-0.0072195395	
serial_timesteps	89856	
time_elapsed	501	
total_timesteps	89856	
value_loss	0.0025856139	

approxkl	0.00054617005	
clipfrac	0.0046875	
explained_variance	0.442	
fps	168	
n_updates	2809	
policy_entropy	0.30876693	
policy_loss	-0.0022262735	
serial_timesteps	89888	
time_elapsed	501	
total_timesteps	89888	
value_loss	0.0002592987	

approxkl	0.002176129	
clipfrac	0.01875	
explained_variance	0.934	

fps	171	
n_updates	2810	
policy_entropy	0.33135414	
policy_loss	-0.006719587	
serial_timesteps	89920	
time_elapsed	502	
total_timesteps	89920	
value_loss	6.0300594e-05	

approxkl	0.0051388377	
clipfrac	0.0875	
explained_variance	0.0955	
fps	165	
n_updates	2811	
policy_entropy	0.31819645	
policy_loss	-0.01905877	
serial_timesteps	89952	
time_elapsed	502	
total_timesteps	89952	
value_loss	0.00039286353	

approxkl	0.009005899	
clipfrac	0.175	
explained_variance	0.492	
fps	161	
n_updates	2812	
policy_entropy	0.27615935	
policy_loss	-0.014989885	
serial_timesteps	89984	
time_elapsed	502	
total_timesteps	89984	
value_loss	0.00025688185	

approxkl	0.00053212745	
clipfrac	0.00625	
explained_variance	-0.000212	
fps	161	
n_updates	2813	
policy_entropy	0.29741308	
policy_loss	-0.0008571787	
serial_timesteps	90016	
time_elapsed	502	
total_timesteps	90016	
value_loss	95.88527	

approxkl	0.0075256363	
clipfrac	0.096875	
explained_variance	0.661	
fps	170	
n_updates	2814	
policy_entropy	0.32019502	
policy_loss	-0.018061837	
serial_timesteps	90048	
time_elapsed	502	
total_timesteps	90048	
value_loss	0.0023485478	

approxkl	0.0074852197	
clipfrac	0.0734375	
explained_variance	0.582	
fps	174	
n_updates	2815	
policy_entropy	0.29651785	
policy_loss	-0.011478059	
serial_timesteps	90080	
time_elapsed	503	
total_timesteps	90080	
value_loss	0.0012052788	

approxkl	0.0014882024	
clipfrac	0.0125	
explained_variance	0.000177	
fps	155	
n_updates	2816	
policy_entropy	0.3152611	
policy_loss	0.0019349365	
serial_timesteps	90112	
time_elapsed	503	
total_timesteps	90112	
value_loss	95.47779	

approxkl	0.011046179	
clipfrac	0.1015625	
explained_variance	0.981	
fps	164	
n_updates	2817	
policy_entropy	0.2865726	
policy_loss	-0.01928719	
serial_timesteps	90144	

time_elapsed	503	
total_timesteps	90144	
value_loss	0.00011259977	

approxkl	0.0035342812	
clipfrac	0.0484375	
explained_variance	-0.000564	
fps	183	
n_updates	2818	
policy_entropy	0.35653615	
policy_loss	-0.001975572	
serial_timesteps	90176	
time_elapsed	503	
total_timesteps	90176	
value_loss	93.30904	

approxkl	0.001851152	
clipfrac	0.01875	
explained_variance	0.814	
fps	208	
n_updates	2819	
policy_entropy	0.3535486	
policy_loss	-0.0050554713	
serial_timesteps	90208	
time_elapsed	503	
total_timesteps	90208	
value_loss	0.0011938004	

approxkl	0.0068067694	
clipfrac	0.09375	
explained_variance	0.414	
fps	204	
n_updates	2820	
policy_entropy	0.33608118	
policy_loss	-0.020241778	
serial_timesteps	90240	
time_elapsed	504	
total_timesteps	90240	
value_loss	0.0027588406	

approxkl	0.00090242585	
clipfrac	0.0	
explained_variance	0.869	
fps	200	

n_updates	2821	
policy_entropy	0.3521846	
policy_loss	-0.0073765665	
serial_timesteps	90272	
time_elapsed	504	
total_timesteps	90272	
value_loss	0.00027278266	

approxkl	0.0025431975	
clipfrac	0.0328125	
explained_variance	-0.755	
fps	198	
n_updates	2822	
policy_entropy	0.3474485	
policy_loss	-0.0061162757	
serial_timesteps	90304	
time_elapsed	504	
total_timesteps	90304	
value_loss	0.0008239566	

approxkl	0.016150126	
clipfrac	0.1546875	
explained_variance	0.0513	
fps	199	
n_updates	2823	
policy_entropy	0.33691645	
policy_loss	-0.02302942	
serial_timesteps	90336	
time_elapsed	504	
total_timesteps	90336	
value_loss	0.00062890496	

approxkl	0.0056460546	
clipfrac	0.0734375	
explained_variance	0.914	
fps	173	
n_updates	2824	
policy_entropy	0.31103092	
policy_loss	-0.015332639	
serial_timesteps	90368	
time_elapsed	504	
total_timesteps	90368	
value_loss	0.00018982553	

approxkl	0.0044436962	
clipfrac	0.0765625	
explained_variance	0.485	
fps	177	
n_updates	2825	
policy_entropy	0.36253387	
policy_loss	-0.010400989	
serial_timesteps	90400	
time_elapsed	504	
total_timesteps	90400	
value_loss	0.0014928381	

approxkl	0.00016485466	
clipfrac	0.0	
explained_variance	0.00334	
fps	203	
n_updates	2826	
policy_entropy	0.33415884	
policy_loss	0.0006012719	
serial_timesteps	90432	
time_elapsed	505	
total_timesteps	90432	
value_loss	59.09215	

approxkl	0.0031914623	
clipfrac	0.0515625	
explained_variance	0.802	
fps	197	
n_updates	2827	
policy_entropy	0.3468039	
policy_loss	-0.0046919296	
serial_timesteps	90464	
time_elapsed	505	
total_timesteps	90464	
value_loss	0.0009795439	

approxkl	0.0034364914	
clipfrac	0.0578125	
explained_variance	0.543	
fps	197	
n_updates	2828	
policy_entropy	0.33466077	
policy_loss	-0.00650073	
serial_timesteps	90496	
time_elapsed	505	

total_timesteps	90496	
value_loss	0.0009455797	

approxkl	0.0019682213	
clipfrac	0.0359375	
explained_variance	0.732	
fps	199	
n_updates	2829	
policy_entropy	0.28813386	
policy_loss	-0.011931026	
serial_timesteps	90528	
time_elapsed	505	
total_timesteps	90528	
value_loss	0.00020195481	

approxkl	0.001253134	
clipfrac	0.0171875	
explained_variance	0.825	
fps	189	
n_updates	2830	
policy_entropy	0.2988206	
policy_loss	0.00045558	
serial_timesteps	90560	
time_elapsed	505	
total_timesteps	90560	
value_loss	0.00026807614	

approxkl	0.010568924	
clipfrac	0.1296875	
explained_variance	0.678	
fps	177	
n_updates	2831	
policy_entropy	0.30592003	
policy_loss	-0.019144014	
serial_timesteps	90592	
time_elapsed	505	
total_timesteps	90592	
value_loss	0.0010401265	

approxkl	0.0019868365	
clipfrac	0.0421875	
explained_variance	-0.000394	
fps	203	
n_updates	2832	

policy_entropy	0.29615194	
policy_loss	-0.00711848	
serial_timesteps	90624	
time_elapsed	506	
total_timesteps	90624	
value_loss	95.25599	

approxkl	0.00037892553	
clipfrac	0.0	
explained_variance	0.954	
fps	202	
n_updates	2833	
policy_entropy	0.3322639	
policy_loss	-0.0021354854	
serial_timesteps	90656	
time_elapsed	506	
total_timesteps	90656	
value_loss	0.00025409143	

approxkl	0.0020787085	
clipfrac	0.0375	
explained_variance	0.537	
fps	202	
n_updates	2834	
policy_entropy	0.35073644	
policy_loss	-0.009281529	
serial_timesteps	90688	
time_elapsed	506	
total_timesteps	90688	
value_loss	0.0007578572	

approxkl	0.0017129524	
clipfrac	0.0140625	
explained_variance	-0.736	
fps	166	
n_updates	2835	
policy_entropy	0.35948664	
policy_loss	-0.00711205	
serial_timesteps	90720	
time_elapsed	506	
total_timesteps	90720	
value_loss	0.00043386657	

approxkl	0.006615357	
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clipfrac	0.0921875	
explained_variance	0.981	
fps	168	
n_updates	2836	
policy_entropy	0.31734756	
policy_loss	-0.019002002	
serial_timesteps	90752	
time_elapsed	506	
total_timesteps	90752	
value_loss	7.670115e-05	

approxkl	0.0014976292	
clipfrac	0.0171875	
explained_variance	-0.00313	
fps	193	
n_updates	2837	
policy_entropy	0.39357972	
policy_loss	-0.00093922706	
serial_timesteps	90784	
time_elapsed	506	
total_timesteps	90784	
value_loss	94.00811	

approxkl	8.1381084e-05	
clipfrac	0.0	
explained_variance	0.877	
fps	164	
n_updates	2838	
policy_entropy	0.37702534	
policy_loss	-0.0008102661	
serial_timesteps	90816	
time_elapsed	507	
total_timesteps	90816	
value_loss	0.00039025157	

approxkl	0.0034034732	
clipfrac	0.034375	
explained_variance	-1.27	
fps	160	
n_updates	2839	
policy_entropy	0.37299436	
policy_loss	-0.01161064	
serial_timesteps	90848	
time_elapsed	507	
total_timesteps	90848	

value_loss	0.0010159982	
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approxkl	0.0074316664	
clipfrac	0.1234375	
explained_variance	-0.937	
fps	168	
n_updates	2840	
policy_entropy	0.40841222	
policy_loss	-0.02130137	
serial_timesteps	90880	
time_elapsed	507	
total_timesteps	90880	
value_loss	0.0005272363	

approxkl	0.00268707	
clipfrac	0.028125	
explained_variance	0.853	
fps	148	
n_updates	2841	
policy_entropy	0.3958337	
policy_loss	-0.01006206	
serial_timesteps	90912	
time_elapsed	507	
total_timesteps	90912	
value_loss	0.0002107961	

approxkl	0.0013243967	
clipfrac	0.0171875	
explained_variance	0.287	
fps	172	
n_updates	2842	
policy_entropy	0.3421243	
policy_loss	-0.0046888967	
serial_timesteps	90944	
time_elapsed	507	
total_timesteps	90944	
value_loss	0.00029655153	

approxkl	0.004022193	
clipfrac	0.06875	
explained_variance	0.105	
fps	167	
n_updates	2843	
policy_entropy	0.3549334	

policy_loss	-0.0057883644	
serial_timesteps	90976	
time_elapsed	508	
total_timesteps	90976	
value_loss	0.00038557008	

approxkl	0.00038599953	
clipfrac	0.0015625	
explained_variance	0.804	
fps	166	
n_updates	2844	
policy_entropy	0.3534971	
policy_loss	-0.0021890872	
serial_timesteps	91008	
time_elapsed	508	
total_timesteps	91008	
value_loss	0.00013763938	

approxkl	0.004756725	
clipfrac	0.0625	
explained_variance	0.683	
fps	171	
n_updates	2845	
policy_entropy	0.37740046	
policy_loss	-0.0060558347	
serial_timesteps	91040	
time_elapsed	508	
total_timesteps	91040	
value_loss	0.00020210053	

approxkl	0.002673753	
clipfrac	0.0375	
explained_variance	0.663	
fps	163	
n_updates	2846	
policy_entropy	0.35470232	
policy_loss	-0.009766	
serial_timesteps	91072	
time_elapsed	508	
total_timesteps	91072	
value_loss	0.00039611943	

approxkl	0.0014660277	
clipfrac	0.015625	

explained_variance	0.833	
fps	159	
n_updates	2847	
policy_entropy	0.35940704	
policy_loss	-0.0034112898	
serial_timesteps	91104	
time_elapsed	508	
total_timesteps	91104	
value_loss	7.6454875e-05	

approxkl	0.0066305064	
clipfrac	0.1234375	
explained_variance	0.606	
fps	166	
n_updates	2848	
policy_entropy	0.37318024	
policy_loss	-0.015456529	
serial_timesteps	91136	
time_elapsed	509	
total_timesteps	91136	
value_loss	0.0005001408	

approxkl	0.00086366397	
clipfrac	0.009375	
explained_variance	0.00436	
fps	161	
n_updates	2849	
policy_entropy	0.32315296	
policy_loss	-0.003683035	
serial_timesteps	91168	
time_elapsed	509	
total_timesteps	91168	
value_loss	94.75365	

approxkl	0.00075262587	
clipfrac	0.0	
explained_variance	0.693	
fps	159	
n_updates	2850	
policy_entropy	0.37266526	
policy_loss	-0.0014804732	
serial_timesteps	91200	
time_elapsed	509	
total_timesteps	91200	
value_loss	0.00071828463	

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| approxkl          | 0.004223318 |
| clipfrac          | 0.065625    |
| explained_variance | 0.637        |
| fps               | 174          |
| n_updates         | 2851         |
| policy_entropy    | 0.37109655   |
| policy_loss       | -0.008383646 |
| serial_timesteps  | 91232        |
| time_elapsed      | 509          |
| total_timesteps   | 91232        |
| value_loss        | 0.00067964836 |
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| approxkl          | 0.003762142 |
| clipfrac          | 0.0515625    |
| explained_variance | 0.787        |
| fps               | 157          |
| n_updates         | 2852         |
| policy_entropy    | 0.3422384    |
| policy_loss       | -0.005852779 |
| serial_timesteps  | 91264        |
| time_elapsed      | 509          |
| total_timesteps   | 91264        |
| value_loss        | 0.00012832455 |
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| approxkl          | 0.00040537593 |
| clipfrac          | 0.0           |
| explained_variance | 0.983        |
| fps               | 168          |
| n_updates         | 2853         |
| policy_entropy    | 0.3419695    |
| policy_loss       | -0.00079981226 |
| serial_timesteps  | 91296        |
| time_elapsed      | 509          |
| total_timesteps   | 91296        |
| value_loss        | 4.0048606e-05 |
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| approxkl          | 0.0079877125 |
| clipfrac          | 0.1125        |
| explained_variance | 0.875        |
| fps               | 165          |
| n_updates         | 2854         |
| policy_entropy    | 0.34422147    |
| policy_loss       | -0.012811042 |
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serial_timesteps	91328	
time_elapsed	510	
total_timesteps	91328	
value_loss	0.000521055	

approxkl	0.00096460816	
clipfrac	0.0140625	
explained_variance	-0.396	
fps	163	
n_updates	2855	
policy_entropy	0.3583356	
policy_loss	-0.005105852	
serial_timesteps	91360	
time_elapsed	510	
total_timesteps	91360	
value_loss	0.00013492184	

approxkl	0.0028987874	
clipfrac	0.05625	
explained_variance	0.985	
fps	188	
n_updates	2856	
policy_entropy	0.3493148	
policy_loss	-0.0050861062	
serial_timesteps	91392	
time_elapsed	510	
total_timesteps	91392	
value_loss	1.6599697e-05	

approxkl	0.0025445053	
clipfrac	0.040625	
explained_variance	0.489	
fps	167	
n_updates	2857	
policy_entropy	0.3419748	
policy_loss	-0.009396702	
serial_timesteps	91424	
time_elapsed	510	
total_timesteps	91424	
value_loss	0.00022489406	

approxkl	0.008451321	
clipfrac	0.096875	
explained_variance	0.453	

fps	185	
n_updates	2858	
policy_entropy	0.30787078	
policy_loss	-0.013387473	
serial_timesteps	91456	
time_elapsed	510	
total_timesteps	91456	
value_loss	0.0001547071	

approxkl	0.0013859576	
clipfrac	0.0140625	
explained_variance	0.978	
fps	207	
n_updates	2859	
policy_entropy	0.32538578	
policy_loss	-0.008662105	
serial_timesteps	91488	
time_elapsed	511	
total_timesteps	91488	
value_loss	3.7792226e-05	

approxkl	0.0017201226	
clipfrac	0.0234375	
explained_variance	0.779	
fps	203	
n_updates	2860	
policy_entropy	0.31020576	
policy_loss	-0.0021708165	
serial_timesteps	91520	
time_elapsed	511	
total_timesteps	91520	
value_loss	0.0003107048	

approxkl	0.002825579	
clipfrac	0.0421875	
explained_variance	0.42	
fps	172	
n_updates	2861	
policy_entropy	0.31472212	
policy_loss	-0.008813522	
serial_timesteps	91552	
time_elapsed	511	
total_timesteps	91552	
value_loss	0.000104752915	

approxkl	0.005705775	
clipfrac	0.0875	
explained_variance	0.955	
fps	183	
n_updates	2862	
policy_entropy	0.27574986	
policy_loss	-0.016834056	
serial_timesteps	91584	
time_elapsed	511	
total_timesteps	91584	
value_loss	0.00013606358	

approxkl	0.014021078	
clipfrac	0.146875	
explained_variance	0.477	
fps	161	
n_updates	2863	
policy_entropy	0.3029769	
policy_loss	-0.021779388	
serial_timesteps	91616	
time_elapsed	511	
total_timesteps	91616	
value_loss	0.0010026216	

approxkl	0.0020729608	
clipfrac	0.01875	
explained_variance	-0.00341	
fps	171	
n_updates	2864	
policy_entropy	0.28586072	
policy_loss	-0.0060334858	
serial_timesteps	91648	
time_elapsed	511	
total_timesteps	91648	
value_loss	96.15547	

approxkl	0.0005010343	
clipfrac	0.0046875	
explained_variance	0.812	
fps	174	
n_updates	2865	
policy_entropy	0.29089	
policy_loss	-0.006152886	
serial_timesteps	91680	

time_elapsed	512	
total_timesteps	91680	
value_loss	0.00014131067	

approxkl	0.00011933061	
clipfrac	0.0	
explained_variance	0.899	
fps	167	
n_updates	2866	
policy_entropy	0.25663573	
policy_loss	-0.00067621435	
serial_timesteps	91712	
time_elapsed	512	
total_timesteps	91712	
value_loss	0.00018384121	

approxkl	0.012266846	
clipfrac	0.13125	
explained_variance	-0.111	
fps	188	
n_updates	2867	
policy_entropy	0.27165374	
policy_loss	-0.013929492	
serial_timesteps	91744	
time_elapsed	512	
total_timesteps	91744	
value_loss	0.00028901803	

approxkl	0.006335236	
clipfrac	0.1	
explained_variance	-0.473	
fps	160	
n_updates	2868	
policy_entropy	0.2714671	
policy_loss	-0.012895194	
serial_timesteps	91776	
time_elapsed	512	
total_timesteps	91776	
value_loss	0.00020703478	

approxkl	0.0030567425	
clipfrac	0.046875	
explained_variance	0.865	
fps	167	

n_updates	2869	
policy_entropy	0.29140732	
policy_loss	-0.016957473	
serial_timesteps	91808	
time_elapsed	512	
total_timesteps	91808	
value_loss	7.6418946e-05	

approxkl	0.000783665	
clipfrac	0.0046875	
explained_variance	-0.434	
fps	164	
n_updates	2870	
policy_entropy	0.31466508	
policy_loss	-0.0059197173	
serial_timesteps	91840	
time_elapsed	513	
total_timesteps	91840	
value_loss	9.2771574e-05	

approxkl	0.001994179	
clipfrac	0.034375	
explained_variance	0.5	
fps	168	
n_updates	2871	
policy_entropy	0.28010523	
policy_loss	-0.011092728	
serial_timesteps	91872	
time_elapsed	513	
total_timesteps	91872	
value_loss	0.00013624437	

approxkl	0.00314584	
clipfrac	0.0546875	
explained_variance	0.845	
fps	165	
n_updates	2872	
policy_entropy	0.28373036	
policy_loss	-0.006086899	
serial_timesteps	91904	
time_elapsed	513	
total_timesteps	91904	
value_loss	2.570739e-05	

approxkl	0.0043332214	
clipfrac	0.053125	
explained_variance	0.965	
fps	159	
n_updates	2873	
policy_entropy	0.2713126	
policy_loss	-0.0051460518	
serial_timesteps	91936	
time_elapsed	513	
total_timesteps	91936	
value_loss	2.623396e-05	

approxkl	0.006698939	
clipfrac	0.084375	
explained_variance	0.885	
fps	172	
n_updates	2874	
policy_entropy	0.2966153	
policy_loss	-0.018287564	
serial_timesteps	91968	
time_elapsed	513	
total_timesteps	91968	
value_loss	0.00032291526	

approxkl	0.0010303386	
clipfrac	0.021875	
explained_variance	-0.302	
fps	164	
n_updates	2875	
policy_entropy	0.279938	
policy_loss	-0.014205414	
serial_timesteps	92000	
time_elapsed	514	
total_timesteps	92000	
value_loss	2.5105686e-05	

approxkl	0.0022543762	
clipfrac	0.01875	
explained_variance	0.991	
fps	147	
n_updates	2876	
policy_entropy	0.297186	
policy_loss	-0.008033218	
serial_timesteps	92032	
time_elapsed	514	

total_timesteps	92032	
value_loss	3.4485588e-06	

approxkl	0.0020231009	
clipfrac	0.01875	
explained_variance	0.334	
fps	184	
n_updates	2877	
policy_entropy	0.24748304	
policy_loss	-0.010627372	
serial_timesteps	92064	
time_elapsed	514	
total_timesteps	92064	
value_loss	6.5455606e-05	

approxkl	0.0026739626	
clipfrac	0.0390625	
explained_variance	0.775	
fps	192	
n_updates	2878	
policy_entropy	0.25339937	
policy_loss	-0.005325605	
serial_timesteps	92096	
time_elapsed	514	
total_timesteps	92096	
value_loss	4.6599973e-05	

approxkl	0.001113432	
clipfrac	0.0171875	
explained_variance	0.59	
fps	192	
n_updates	2879	
policy_entropy	0.28227696	
policy_loss	-0.0019558677	
serial_timesteps	92128	
time_elapsed	514	
total_timesteps	92128	
value_loss	7.2250796e-06	

approxkl	0.00025204997	
clipfrac	0.0	
explained_variance	0.00435	
fps	191	
n_updates	2880	

policy_entropy	0.26641527	
policy_loss	-0.0004674782	
serial_timesteps	92160	
time_elapsed	515	
total_timesteps	92160	
value_loss	95.85524	

approxkl	0.0021259203	
clipfrac	0.025	
explained_variance	0.799	
fps	167	
n_updates	2881	
policy_entropy	0.30087453	
policy_loss	-0.010968184	
serial_timesteps	92192	
time_elapsed	515	
total_timesteps	92192	
value_loss	0.0016438641	

approxkl	0.0007296022	
clipfrac	0.009375	
explained_variance	0.348	
fps	164	
n_updates	2882	
policy_entropy	0.25199866	
policy_loss	-0.0022087046	
serial_timesteps	92224	
time_elapsed	515	
total_timesteps	92224	
value_loss	0.0003714578	

approxkl	0.0012399583	
clipfrac	0.0046875	
explained_variance	0.459	
fps	191	
n_updates	2883	
policy_entropy	0.27463892	
policy_loss	9.710528e-06	
serial_timesteps	92256	
time_elapsed	515	
total_timesteps	92256	
value_loss	3.4718418e-05	

approxkl	0.0019475907	
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clipfrac	0.025	
explained_variance	0.217	
fps	192	
n_updates	2884	
policy_entropy	0.22892496	
policy_loss	-0.006360364	
serial_timesteps	92288	
time_elapsed	515	
total_timesteps	92288	
value_loss	4.6186426e-05	

approxkl	0.0029037911	
clipfrac	0.0515625	
explained_variance	-2.08	
fps	164	
n_updates	2885	
policy_entropy	0.28910512	
policy_loss	-0.003445095	
serial_timesteps	92320	
time_elapsed	515	
total_timesteps	92320	
value_loss	4.9841346e-05	

approxkl	0.0030077773	
clipfrac	0.0375	
explained_variance	-2.17	
fps	177	
n_updates	2886	
policy_entropy	0.3141318	
policy_loss	-0.020915646	
serial_timesteps	92352	
time_elapsed	516	
total_timesteps	92352	
value_loss	4.8823924e-05	

approxkl	0.0014847559	
clipfrac	0.009375	
explained_variance	0.601	
fps	159	
n_updates	2887	
policy_entropy	0.29361862	
policy_loss	-0.0057904334	
serial_timesteps	92384	
time_elapsed	516	
total_timesteps	92384	

value_loss	1.4242595e-05	
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approxkl	0.005004062	
clipfrac	0.0703125	
explained_variance	0.985	
fps	176	
n_updates	2888	
policy_entropy	0.2463105	
policy_loss	-0.01018504	
serial_timesteps	92416	
time_elapsed	516	
total_timesteps	92416	
value_loss	6.9586167e-06	

approxkl	0.0015712387	
clipfrac	0.0203125	
explained_variance	0.824	
fps	175	
n_updates	2889	
policy_entropy	0.2523076	
policy_loss	-0.007526477	
serial_timesteps	92448	
time_elapsed	516	
total_timesteps	92448	
value_loss	7.761051e-05	

approxkl	0.009477396	
clipfrac	0.1109375	
explained_variance	0.74	
fps	161	
n_updates	2890	
policy_entropy	0.25116983	
policy_loss	-0.012019599	
serial_timesteps	92480	
time_elapsed	516	
total_timesteps	92480	
value_loss	6.42389e-05	

approxkl	0.0026936803	
clipfrac	0.0546875	
explained_variance	0.884	
fps	162	
n_updates	2891	
policy_entropy	0.27849108	

policy_loss	-0.0093686	
serial_timesteps	92512	
time_elapsed	517	
total_timesteps	92512	
value_loss	6.616926e-06	

approxkl	0.0013602711	
clipfrac	0.015625	
explained_variance	0.97	
fps	167	
n_updates	2892	
policy_entropy	0.2451214	
policy_loss	-0.003436749	
serial_timesteps	92544	
time_elapsed	517	
total_timesteps	92544	
value_loss	0.00011897477	

approxkl	0.007731132	
clipfrac	0.0984375	
explained_variance	0.926	
fps	167	
n_updates	2893	
policy_entropy	0.24254492	
policy_loss	-0.014797243	
serial_timesteps	92576	
time_elapsed	517	
total_timesteps	92576	
value_loss	0.00045959363	

approxkl	0.007291694	
clipfrac	0.1046875	
explained_variance	0.628	
fps	192	
n_updates	2894	
policy_entropy	0.29782486	
policy_loss	-0.028599584	
serial_timesteps	92608	
time_elapsed	517	
total_timesteps	92608	
value_loss	0.00012419258	

approxkl	0.007896395	
clipfrac	0.13125	

explained_variance	0.944	
fps	172	
n_updates	2895	
policy_entropy	0.22938037	
policy_loss	-0.012711642	
serial_timesteps	92640	
time_elapsed	517	
total_timesteps	92640	
value_loss	7.7080935e-05	

approxkl	0.00038381154	
clipfrac	0.003125	
explained_variance	0.00473	
fps	177	
n_updates	2896	
policy_entropy	0.24182399	
policy_loss	-0.0018124322	
serial_timesteps	92672	
time_elapsed	517	
total_timesteps	92672	
value_loss	93.96068	

approxkl	0.0017704202	
clipfrac	0.0359375	
explained_variance	0.882	
fps	169	
n_updates	2897	
policy_entropy	0.2107029	
policy_loss	-0.0008885474	
serial_timesteps	92704	
time_elapsed	518	
total_timesteps	92704	
value_loss	0.0003025177	

approxkl	0.0063221855	
clipfrac	0.0796875	
explained_variance	0.701	
fps	158	
n_updates	2898	
policy_entropy	0.25548783	
policy_loss	-0.019045368	
serial_timesteps	92736	
time_elapsed	518	
total_timesteps	92736	
value_loss	0.0005774081	

approxkl	0.0030344203	
clipfrac	0.0453125	
explained_variance	0.428	
fps	155	
n_updates	2899	
policy_entropy	0.21124132	
policy_loss	-0.010613742	
serial_timesteps	92768	
time_elapsed	518	
total_timesteps	92768	
value_loss	6.722227e-05	

approxkl	0.0014963404	
clipfrac	0.0125	
explained_variance	0.919	
fps	189	
n_updates	2900	
policy_entropy	0.2302111	
policy_loss	-0.0012989269	
serial_timesteps	92800	
time_elapsed	518	
total_timesteps	92800	
value_loss	6.114952e-05	

approxkl	0.0031319938	
clipfrac	0.0421875	
explained_variance	0.567	
fps	194	
n_updates	2901	
policy_entropy	0.22784182	
policy_loss	-0.008802394	
serial_timesteps	92832	
time_elapsed	518	
total_timesteps	92832	
value_loss	0.00021750022	

approxkl	0.0030960366	
clipfrac	0.040625	
explained_variance	-0.278	
fps	214	
n_updates	2902	
policy_entropy	0.27169582	
policy_loss	-0.0065906495	

serial_timesteps	92864	
time_elapsed	519	
total_timesteps	92864	
value_loss	5.154457e-05	

approxkl	0.0012880934	
clipfrac	0.015625	
explained_variance	0.953	
fps	187	
n_updates	2903	
policy_entropy	0.22280395	
policy_loss	-0.0047462196	
serial_timesteps	92896	
time_elapsed	519	
total_timesteps	92896	
value_loss	2.640441e-05	

approxkl	0.0008438545	
clipfrac	0.00625	
explained_variance	-2.13	
fps	178	
n_updates	2904	
policy_entropy	0.29430658	
policy_loss	-0.0022880305	
serial_timesteps	92928	
time_elapsed	519	
total_timesteps	92928	
value_loss	6.996939e-05	

approxkl	5.9746246e-05	
clipfrac	0.0	
explained_variance	0.217	
fps	176	
n_updates	2905	
policy_entropy	0.20579195	
policy_loss	-0.0007471301	
serial_timesteps	92960	
time_elapsed	519	
total_timesteps	92960	
value_loss	5.921923e-05	

approxkl	0.0018472545	
clipfrac	0.028125	
explained_variance	0.889	

fps	207	
n_updates	2906	
policy_entropy	0.21524191	
policy_loss	-0.0037882861	
serial_timesteps	92992	
time_elapsed	519	
total_timesteps	92992	
value_loss	2.0227837e-05	

approxkl	0.003567569	
clipfrac	0.065625	
explained_variance	0.968	
fps	188	
n_updates	2907	
policy_entropy	0.22805743	
policy_loss	-0.0148909865	
serial_timesteps	93024	
time_elapsed	519	
total_timesteps	93024	
value_loss	1.7407745e-05	

approxkl	0.0016626796	
clipfrac	0.021875	
explained_variance	0.807	
fps	191	
n_updates	2908	
policy_entropy	0.19424519	
policy_loss	-0.0034113103	
serial_timesteps	93056	
time_elapsed	520	
total_timesteps	93056	
value_loss	4.0452196e-05	

approxkl	0.0011079628	
clipfrac	0.0109375	
explained_variance	-2.42	
fps	168	
n_updates	2909	
policy_entropy	0.16431026	
policy_loss	-0.0013867568	
serial_timesteps	93088	
time_elapsed	520	
total_timesteps	93088	
value_loss	1.9827301e-05	

approxkl	0.00026474442	
clipfrac	0.0	
explained_variance	0.963	
fps	185	
n_updates	2910	
policy_entropy	0.19776835	
policy_loss	-0.0015268589	
serial_timesteps	93120	
time_elapsed	520	
total_timesteps	93120	
value_loss	6.154665e-06	

approxkl	6.9018584e-05	
clipfrac	0.0	
explained_variance	0.000721	
fps	168	
n_updates	2911	
policy_entropy	0.15470499	
policy_loss	-0.00027894432	
serial_timesteps	93152	
time_elapsed	520	
total_timesteps	93152	
value_loss	95.86122	

approxkl	0.0052472386	
clipfrac	0.0875	
explained_variance	0.863	
fps	165	
n_updates	2912	
policy_entropy	0.26503807	
policy_loss	-0.021795025	
serial_timesteps	93184	
time_elapsed	520	
total_timesteps	93184	
value_loss	0.00092586334	

approxkl	0.002477642	
clipfrac	0.0359375	
explained_variance	0.741	
fps	169	
n_updates	2913	
policy_entropy	0.24801269	
policy_loss	-0.0041480325	
serial_timesteps	93216	

time_elapsed	521	
total_timesteps	93216	
value_loss	0.00065889116	

approxkl	0.0018260597	
clipfrac	0.0421875	
explained_variance	-0.399	
fps	171	
n_updates	2914	
policy_entropy	0.26838252	
policy_loss	-0.00849135	
serial_timesteps	93248	
time_elapsed	521	
total_timesteps	93248	
value_loss	0.00012591551	

approxkl	0.0033147722	
clipfrac	0.0421875	
explained_variance	0.981	
fps	164	
n_updates	2915	
policy_entropy	0.28701597	
policy_loss	-0.010086128	
serial_timesteps	93280	
time_elapsed	521	
total_timesteps	93280	
value_loss	2.0006924e-05	

approxkl	0.0024236506	
clipfrac	0.028125	
explained_variance	0.553	
fps	190	
n_updates	2916	
policy_entropy	0.298585	
policy_loss	-0.00966125	
serial_timesteps	93312	
time_elapsed	521	
total_timesteps	93312	
value_loss	0.00020710612	

approxkl	0.003061497	
clipfrac	0.0390625	
explained_variance	0.506	
fps	182	

n_updates	2917	
policy_entropy	0.2750364	
policy_loss	-0.006513781	
serial_timesteps	93344	
time_elapsed	521	
total_timesteps	93344	
value_loss	0.00013001791	

approxkl	0.0005502565	
clipfrac	0.0046875	
explained_variance	0.956	
fps	196	
n_updates	2918	
policy_entropy	0.29751813	
policy_loss	-0.003922311	
serial_timesteps	93376	
time_elapsed	521	
total_timesteps	93376	
value_loss	1.6440054e-05	

approxkl	0.0024232226	
clipfrac	0.0484375	
explained_variance	-0.0782	
fps	202	
n_updates	2919	
policy_entropy	0.29497656	
policy_loss	-0.006458198	
serial_timesteps	93408	
time_elapsed	522	
total_timesteps	93408	
value_loss	9.453344e-05	

approxkl	0.0020758533	
clipfrac	0.0421875	
explained_variance	0.804	
fps	207	
n_updates	2920	
policy_entropy	0.27778804	
policy_loss	-0.0028094996	
serial_timesteps	93440	
time_elapsed	522	
total_timesteps	93440	
value_loss	0.00012544941	

approxkl	0.004255357	
clipfrac	0.0625	
explained_variance	0.87	
fps	180	
n_updates	2921	
policy_entropy	0.2604023	
policy_loss	-0.010782053	
serial_timesteps	93472	
time_elapsed	522	
total_timesteps	93472	
value_loss	1.9778101e-05	

approxkl	0.0051549175	
clipfrac	0.0484375	
explained_variance	0.924	
fps	166	
n_updates	2922	
policy_entropy	0.22490315	
policy_loss	-0.007355227	
serial_timesteps	93504	
time_elapsed	522	
total_timesteps	93504	
value_loss	0.00010233537	

approxkl	0.001508659	
clipfrac	0.0234375	
explained_variance	0.854	
fps	169	
n_updates	2923	
policy_entropy	0.24965899	
policy_loss	-0.0035048407	
serial_timesteps	93536	
time_elapsed	522	
total_timesteps	93536	
value_loss	0.0002536956	

approxkl	0.00414539	
clipfrac	0.0734375	
explained_variance	0.69	
fps	175	
n_updates	2924	
policy_entropy	0.21989457	
policy_loss	-0.025995592	
serial_timesteps	93568	
time_elapsed	522	

total_timesteps	93568	
value_loss	6.180813e-05	

approxkl	0.011485634	
clipfrac	0.0828125	
explained_variance	0.766	
fps	206	
n_updates	2925	
policy_entropy	0.21872985	
policy_loss	-0.011024222	
serial_timesteps	93600	
time_elapsed	523	
total_timesteps	93600	
value_loss	0.00060702884	

approxkl	0.0015080188	
clipfrac	0.021875	
explained_variance	0.00397	
fps	202	
n_updates	2926	
policy_entropy	0.24707344	
policy_loss	-0.010343077	
serial_timesteps	93632	
time_elapsed	523	
total_timesteps	93632	
value_loss	95.14278	

approxkl	0.003282766	
clipfrac	0.06875	
explained_variance	-2.54	
fps	201	
n_updates	2927	
policy_entropy	0.22048526	
policy_loss	-0.0050304355	
serial_timesteps	93664	
time_elapsed	523	
total_timesteps	93664	
value_loss	0.00085538195	

approxkl	0.0055103097	
clipfrac	0.08125	
explained_variance	0.577	
fps	183	
n_updates	2928	

policy_entropy	0.24334948	
policy_loss	-0.009141001	
serial_timesteps	93696	
time_elapsed	523	
total_timesteps	93696	
value_loss	0.0004068853	

approxkl	0.007662651	
clipfrac	0.1515625	
explained_variance	0.88	
fps	155	
n_updates	2929	
policy_entropy	0.28991142	
policy_loss	-0.010999592	
serial_timesteps	93728	
time_elapsed	523	
total_timesteps	93728	
value_loss	9.1294256e-05	

approxkl	0.0007008485	
clipfrac	0.0	
explained_variance	0.303	
fps	162	
n_updates	2930	
policy_entropy	0.2600023	
policy_loss	-1.475662e-05	
serial_timesteps	93760	
time_elapsed	524	
total_timesteps	93760	
value_loss	0.00015211669	

approxkl	0.0041178027	
clipfrac	0.084375	
explained_variance	0.399	
fps	165	
n_updates	2931	
policy_entropy	0.2421448	
policy_loss	-0.008051237	
serial_timesteps	93792	
time_elapsed	524	
total_timesteps	93792	
value_loss	0.00031549466	

approxkl	0.0006223389	
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clipfrac	0.0	
explained_variance	0.96	
fps	200	
n_updates	2932	
policy_entropy	0.26708752	
policy_loss	-0.003358656	
serial_timesteps	93824	
time_elapsed	524	
total_timesteps	93824	
value_loss	2.243252e-05	

approxkl	0.0040637306	
clipfrac	0.05625	
explained_variance	-0.456	
fps	206	
n_updates	2933	
policy_entropy	0.23271441	
policy_loss	-0.008689581	
serial_timesteps	93856	
time_elapsed	524	
total_timesteps	93856	
value_loss	0.00016826313	

approxkl	0.000957187	
clipfrac	0.0140625	
explained_variance	-0.3	
fps	175	
n_updates	2934	
policy_entropy	0.3062082	
policy_loss	-0.0052831816	
serial_timesteps	93888	
time_elapsed	524	
total_timesteps	93888	
value_loss	8.51013e-05	

approxkl	0.0031123098	
clipfrac	0.040625	
explained_variance	0.973	
fps	165	
n_updates	2935	
policy_entropy	0.24693255	
policy_loss	-0.00497561	
serial_timesteps	93920	
time_elapsed	524	
total_timesteps	93920	

value_loss	2.4268858e-05	
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approxkl	0.0059352242	
clipfrac	0.0515625	
explained_variance	0.778	
fps	198	
n_updates	2936	
policy_entropy	0.24493551	
policy_loss	-0.016417585	
serial_timesteps	93952	
time_elapsed	525	
total_timesteps	93952	
value_loss	0.00011075624	

approxkl	0.014653927	
clipfrac	0.1625	
explained_variance	0.575	
fps	210	
n_updates	2937	
policy_entropy	0.272814	
policy_loss	-0.018601876	
serial_timesteps	93984	
time_elapsed	525	
total_timesteps	93984	
value_loss	3.6998663e-05	

approxkl	0.0059383167	
clipfrac	0.078125	
explained_variance	0.913	
fps	186	
n_updates	2938	
policy_entropy	0.3036764	
policy_loss	-0.0108195115	
serial_timesteps	94016	
time_elapsed	525	
total_timesteps	94016	
value_loss	1.6089845e-05	

approxkl	0.0050462047	
clipfrac	0.0703125	
explained_variance	0.59	
fps	193	
n_updates	2939	
policy_entropy	0.27513552	

policy_loss	-0.012903297	
serial_timesteps	94048	
time_elapsed	525	
total_timesteps	94048	
value_loss	3.833067e-05	

approxkl	0.0024052234	
clipfrac	0.03125	
explained_variance	0.0845	
fps	172	
n_updates	2940	
policy_entropy	0.25237036	
policy_loss	-0.0035662868	
serial_timesteps	94080	
time_elapsed	525	
total_timesteps	94080	
value_loss	1.5852838e-05	

approxkl	0.0024774503	
clipfrac	0.03125	
explained_variance	0.00112	
fps	163	
n_updates	2941	
policy_entropy	0.30304822	
policy_loss	-0.011352508	
serial_timesteps	94112	
time_elapsed	525	
total_timesteps	94112	
value_loss	95.79447	

approxkl	0.004473176	
clipfrac	0.084375	
explained_variance	0.96	
fps	201	
n_updates	2942	
policy_entropy	0.2609281	
policy_loss	-0.016624182	
serial_timesteps	94144	
time_elapsed	526	
total_timesteps	94144	
value_loss	9.1800815e-05	

approxkl	0.0016341666	
clipfrac	0.0234375	

explained_variance	0.676	
fps	206	
n_updates	2943	
policy_entropy	0.29555124	
policy_loss	-0.0069682314	
serial_timesteps	94176	
time_elapsed	526	
total_timesteps	94176	
value_loss	0.0007202135	

approxkl	0.0017915554	
clipfrac	0.025	
explained_variance	0.243	
fps	201	
n_updates	2944	
policy_entropy	0.29897103	
policy_loss	-0.0064772083	
serial_timesteps	94208	
time_elapsed	526	
total_timesteps	94208	
value_loss	0.00030078102	

approxkl	0.0014155883	
clipfrac	0.0171875	
explained_variance	-0.0633	
fps	201	
n_updates	2945	
policy_entropy	0.3206586	
policy_loss	-0.004370935	
serial_timesteps	94240	
time_elapsed	526	
total_timesteps	94240	
value_loss	0.00020038061	

approxkl	0.005295564	
clipfrac	0.1171875	
explained_variance	0.17	
fps	179	
n_updates	2946	
policy_entropy	0.24506228	
policy_loss	-0.0046217632	
serial_timesteps	94272	
time_elapsed	526	
total_timesteps	94272	
value_loss	0.0002520846	

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| approxkl          | 0.0017729022 |
| clipfrac          | 0.015625      |
| explained_variance | 0.885          |
| fps               | 184            |
| n_updates          | 2947           |
| policy_entropy     | 0.29368418     |
| policy_loss        | -0.0102337655  |
| serial_timesteps   | 94304          |
| time_elapsed       | 526            |
| total_timesteps    | 94304          |
| value_loss         | 0.00014738794 |
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| approxkl          | 0.007099704    |
| clipfrac          | 0.0890625      |
| explained_variance | -1.51           |
| fps               | 210            |
| n_updates          | 2948           |
| policy_entropy     | 0.2647515      |
| policy_loss        | -0.0042506214  |
| serial_timesteps   | 94336          |
| time_elapsed       | 527            |
| total_timesteps    | 94336          |
| value_loss         | 0.00011306574  |
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| approxkl          | 0.01013053     |
| clipfrac          | 0.109375       |
| explained_variance | -0.233          |
| fps               | 202            |
| n_updates          | 2949           |
| policy_entropy     | 0.30181494     |
| policy_loss        | -0.007915261   |
| serial_timesteps   | 94368          |
| time_elapsed       | 527            |
| total_timesteps    | 94368          |
| value_loss         | 0.00012683767  |
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| approxkl          | 0.0071745934   |
| clipfrac          | 0.1125         |
| explained_variance | 0.947           |
| fps               | 188            |
| n_updates          | 2950           |
| policy_entropy     | 0.28704435     |
| policy_loss        | -0.0063474886  |
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serial_timesteps	94400	
time_elapsed	527	
total_timesteps	94400	
value_loss	6.420845e-05	

approxkl	0.0031341345	
clipfrac	0.04375	
explained_variance	0.514	
fps	198	
n_updates	2951	
policy_entropy	0.31908917	
policy_loss	-0.00915093	
serial_timesteps	94432	
time_elapsed	527	
total_timesteps	94432	
value_loss	8.360126e-05	

approxkl	0.008997178	
clipfrac	0.1453125	
explained_variance	0.511	
fps	188	
n_updates	2952	
policy_entropy	0.32031074	
policy_loss	-0.022097293	
serial_timesteps	94464	
time_elapsed	527	
total_timesteps	94464	
value_loss	7.054753e-05	

approxkl	0.004003641	
clipfrac	0.0625	
explained_variance	-0.288	
fps	188	
n_updates	2953	
policy_entropy	0.3386017	
policy_loss	-0.006498893	
serial_timesteps	94496	
time_elapsed	527	
total_timesteps	94496	
value_loss	3.395383e-05	

approxkl	0.0109266415	
clipfrac	0.190625	
explained_variance	-0.626	

fps	193	
n_updates	2954	
policy_entropy	0.29940063	
policy_loss	-0.009645661	
serial_timesteps	94528	
time_elapsed	528	
total_timesteps	94528	
value_loss	4.7739588e-05	

approxkl	0.0019508979	
clipfrac	0.0171875	
explained_variance	0.372	
fps	172	
n_updates	2955	
policy_entropy	0.2630831	
policy_loss	-0.0066390196	
serial_timesteps	94560	
time_elapsed	528	
total_timesteps	94560	
value_loss	2.5408273e-05	

approxkl	0.004690063	
clipfrac	0.0828125	
explained_variance	-0.205	
fps	170	
n_updates	2956	
policy_entropy	0.24873814	
policy_loss	-0.0054943385	
serial_timesteps	94592	
time_elapsed	528	
total_timesteps	94592	
value_loss	1.511311e-05	

approxkl	0.00019350022	
clipfrac	0.0	
explained_variance	0.00209	
fps	169	
n_updates	2957	
policy_entropy	0.29014266	
policy_loss	0.0007004393	
serial_timesteps	94624	
time_elapsed	528	
total_timesteps	94624	
value_loss	95.934456	

approxkl	0.008501413	
clipfrac	0.1015625	
explained_variance	0.962	
fps	193	
n_updates	2958	
policy_entropy	0.28095916	
policy_loss	-0.0093689915	
serial_timesteps	94656	
time_elapsed	528	
total_timesteps	94656	
value_loss	0.00029648744	

approxkl	0.013313207	
clipfrac	0.1203125	
explained_variance	0.764	
fps	184	
n_updates	2959	
policy_entropy	0.24833551	
policy_loss	-0.015557757	
serial_timesteps	94688	
time_elapsed	529	
total_timesteps	94688	
value_loss	0.0007598431	

approxkl	0.0023902855	
clipfrac	0.0296875	
explained_variance	0.735	
fps	205	
n_updates	2960	
policy_entropy	0.26194546	
policy_loss	-0.0071008266	
serial_timesteps	94720	
time_elapsed	529	
total_timesteps	94720	
value_loss	0.00020566685	

approxkl	0.0030971742	
clipfrac	0.05	
explained_variance	-0.249	
fps	169	
n_updates	2961	
policy_entropy	0.23720893	
policy_loss	-0.009642564	
serial_timesteps	94752	

time_elapsed	529	
total_timesteps	94752	
value_loss	0.00022762183	

approxkl	0.0068580643	
clipfrac	0.0828125	
explained_variance	0.593	
fps	181	
n_updates	2962	
policy_entropy	0.25376153	
policy_loss	-0.013127975	
serial_timesteps	94784	
time_elapsed	529	
total_timesteps	94784	
value_loss	0.00021274693	

approxkl	0.0023410758	
clipfrac	0.046875	
explained_variance	0.96	
fps	162	
n_updates	2963	
policy_entropy	0.29023275	
policy_loss	-0.0026011006	
serial_timesteps	94816	
time_elapsed	529	
total_timesteps	94816	
value_loss	3.945205e-05	

approxkl	0.0005663112	
clipfrac	0.003125	
explained_variance	0.701	
fps	158	
n_updates	2964	
policy_entropy	0.2497222	
policy_loss	-0.002592606	
serial_timesteps	94848	
time_elapsed	529	
total_timesteps	94848	
value_loss	0.00019929037	

approxkl	0.004426782	
clipfrac	0.040625	
explained_variance	-0.392	
fps	163	

n_updates	2965	
policy_entropy	0.24870436	
policy_loss	-0.019325886	
serial_timesteps	94880	
time_elapsed	530	
total_timesteps	94880	
value_loss	0.00019270869	

approxkl	0.0031048905	
clipfrac	0.053125	
explained_variance	0.884	
fps	171	
n_updates	2966	
policy_entropy	0.27248657	
policy_loss	-0.0059090126	
serial_timesteps	94912	
time_elapsed	530	
total_timesteps	94912	
value_loss	8.171545e-05	

approxkl	0.013588111	
clipfrac	0.115625	
explained_variance	0.746	
fps	155	
n_updates	2967	
policy_entropy	0.2366778	
policy_loss	-0.022296745	
serial_timesteps	94944	
time_elapsed	530	
total_timesteps	94944	
value_loss	0.00026819782	

approxkl	0.0045139706	
clipfrac	0.04375	
explained_variance	0.941	
fps	166	
n_updates	2968	
policy_entropy	0.26780766	
policy_loss	-0.009400179	
serial_timesteps	94976	
time_elapsed	530	
total_timesteps	94976	
value_loss	7.116013e-05	

approxkl	0.0032162438	
clipfrac	0.0375	
explained_variance	0.761	
fps	164	
n_updates	2969	
policy_entropy	0.27982345	
policy_loss	-0.006860151	
serial_timesteps	95008	
time_elapsed	530	
total_timesteps	95008	
value_loss	0.00029255354	

approxkl	0.0011243988	
clipfrac	0.0125	
explained_variance	-0.597	
fps	162	
n_updates	2970	
policy_entropy	0.29854527	
policy_loss	-0.012872246	
serial_timesteps	95040	
time_elapsed	531	
total_timesteps	95040	
value_loss	6.321373e-05	

approxkl	0.003556534	
clipfrac	0.0453125	
explained_variance	0.844	
fps	152	
n_updates	2971	
policy_entropy	0.24462695	
policy_loss	-0.0074405656	
serial_timesteps	95072	
time_elapsed	531	
total_timesteps	95072	
value_loss	8.776572e-05	

approxkl	0.004131043	
clipfrac	0.0734375	
explained_variance	0.784	
fps	174	
n_updates	2972	
policy_entropy	0.27023244	
policy_loss	-0.013770832	
serial_timesteps	95104	
time_elapsed	531	

total_timesteps	95104	
value_loss	0.0001802071	

approxkl	0.0005285853	
clipfrac	0.0015625	
explained_variance	-0.000138	
fps	178	
n_updates	2973	
policy_entropy	0.23312867	
policy_loss	0.0031785388	
serial_timesteps	95136	
time_elapsed	531	
total_timesteps	95136	
value_loss	94.22575	

approxkl	0.004625836	
clipfrac	0.0671875	
explained_variance	0.574	
fps	202	
n_updates	2974	
policy_entropy	0.31748542	
policy_loss	-0.0027555258	
serial_timesteps	95168	
time_elapsed	531	
total_timesteps	95168	
value_loss	0.00040644297	

approxkl	0.0006060788	
clipfrac	0.0109375	
explained_variance	-2.22	
fps	191	
n_updates	2975	
policy_entropy	0.23446357	
policy_loss	-0.002282041	
serial_timesteps	95200	
time_elapsed	532	
total_timesteps	95200	
value_loss	0.00018666251	

approxkl	0.0034176153	
clipfrac	0.01875	
explained_variance	-0.553	
fps	193	
n_updates	2976	

policy_entropy	0.28564444	
policy_loss	-0.0108803585	
serial_timesteps	95232	
time_elapsed	532	
total_timesteps	95232	
value_loss	0.00018374893	

approxkl	0.021575972	
clipfrac	0.1625	
explained_variance	0.654	
fps	189	
n_updates	2977	
policy_entropy	0.21704037	
policy_loss	-0.03234546	
serial_timesteps	95264	
time_elapsed	532	
total_timesteps	95264	
value_loss	0.00012428897	

approxkl	0.015181857	
clipfrac	0.15625	
explained_variance	-2.08	
fps	184	
n_updates	2978	
policy_entropy	0.29255572	
policy_loss	-0.037919354	
serial_timesteps	95296	
time_elapsed	532	
total_timesteps	95296	
value_loss	0.00020298599	

approxkl	0.017583746	
clipfrac	0.2609375	
explained_variance	-1.13	
fps	187	
n_updates	2979	
policy_entropy	0.32231802	
policy_loss	-0.022880401	
serial_timesteps	95328	
time_elapsed	532	
total_timesteps	95328	
value_loss	5.592039e-05	

approxkl	0.0018332774	
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clipfrac	0.03125	
explained_variance	0.188	
fps	200	
n_updates	2980	
policy_entropy	0.24525817	
policy_loss	-0.0060351603	
serial_timesteps	95360	
time_elapsed	532	
total_timesteps	95360	
value_loss	4.840589e-05	

approxkl	0.012016944	
clipfrac	0.11875	
explained_variance	-1.2	
fps	206	
n_updates	2981	
policy_entropy	0.29960567	
policy_loss	-0.019607482	
serial_timesteps	95392	
time_elapsed	533	
total_timesteps	95392	
value_loss	4.201485e-05	

approxkl	0.0015575233	
clipfrac	0.0234375	
explained_variance	-2.74	
fps	192	
n_updates	2982	
policy_entropy	0.24653831	
policy_loss	-0.0038571483	
serial_timesteps	95424	
time_elapsed	533	
total_timesteps	95424	
value_loss	3.5706464e-05	

approxkl	0.0011054885	
clipfrac	0.0140625	
explained_variance	0.634	
fps	191	
n_updates	2983	
policy_entropy	0.29572973	
policy_loss	-0.0016456705	
serial_timesteps	95456	
time_elapsed	533	
total_timesteps	95456	

value_loss	1.5761641e-05	
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approxkl	0.0013415393	
clipfrac	0.0109375	
explained_variance	-2.66	
fps	201	
n_updates	2984	
policy_entropy	0.3294402	
policy_loss	-0.003706018	
serial_timesteps	95488	
time_elapsed	533	
total_timesteps	95488	
value_loss	2.4599474e-05	

approxkl	0.0047166958	
clipfrac	0.0484375	
explained_variance	0.181	
fps	204	
n_updates	2985	
policy_entropy	0.28186542	
policy_loss	-0.016654687	
serial_timesteps	95520	
time_elapsed	533	
total_timesteps	95520	
value_loss	1.16895435e-05	

approxkl	0.0010987518	
clipfrac	0.0171875	
explained_variance	0.46	
fps	203	
n_updates	2986	
policy_entropy	0.23501003	
policy_loss	-0.015174726	
serial_timesteps	95552	
time_elapsed	533	
total_timesteps	95552	
value_loss	1.1660066e-05	

approxkl	0.0013142284	
clipfrac	0.0046875	
explained_variance	-0.663	
fps	195	
n_updates	2987	
policy_entropy	0.26429552	

policy_loss	-0.0010998362	
serial_timesteps	95584	
time_elapsed	534	
total_timesteps	95584	
value_loss	1.3550048e-05	

approxkl	0.0008622771	
clipfrac	0.009375	
explained_variance	0.000661	
fps	199	
n_updates	2988	
policy_entropy	0.27677038	
policy_loss	-0.007676682	
serial_timesteps	95616	
time_elapsed	534	
total_timesteps	95616	
value_loss	95.95095	

approxkl	0.0045106257	
clipfrac	0.065625	
explained_variance	-1.8	
fps	195	
n_updates	2989	
policy_entropy	0.26776963	
policy_loss	-0.011207099	
serial_timesteps	95648	
time_elapsed	534	
total_timesteps	95648	
value_loss	0.00017056192	

approxkl	0.0010802906	
clipfrac	0.0234375	
explained_variance	0.607	
fps	182	
n_updates	2990	
policy_entropy	0.28261024	
policy_loss	-0.0024015917	
serial_timesteps	95680	
time_elapsed	534	
total_timesteps	95680	
value_loss	0.00017838043	

approxkl	0.004510994	
clipfrac	0.0625	

explained_variance	-2.5	
fps	196	
n_updates	2991	
policy_entropy	0.26853374	
policy_loss	-0.005440996	
serial_timesteps	95712	
time_elapsed	534	
total_timesteps	95712	
value_loss	0.00021745695	

approxkl	0.002277831	
clipfrac	0.03125	
explained_variance	-0.612	
fps	203	
n_updates	2992	
policy_entropy	0.2844699	
policy_loss	-0.0070193624	
serial_timesteps	95744	
time_elapsed	534	
total_timesteps	95744	
value_loss	0.00016105681	

approxkl	0.003785011	
clipfrac	0.0640625	
explained_variance	0.829	
fps	202	
n_updates	2993	
policy_entropy	0.28551653	
policy_loss	-0.019095782	
serial_timesteps	95776	
time_elapsed	535	
total_timesteps	95776	
value_loss	0.00011661088	

approxkl	0.0052243858	
clipfrac	0.0875	
explained_variance	-0.587	
fps	208	
n_updates	2994	
policy_entropy	0.28594658	
policy_loss	-0.0043452373	
serial_timesteps	95808	
time_elapsed	535	
total_timesteps	95808	
value_loss	9.1658294e-05	

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| approxkl          | 0.006105706 |
| clipfrac          | 0.0953125   |
| explained_variance | 0.87         |
| fps               | 202          |
| n_updates          | 2995         |
| policy_entropy     | 0.28927642   |
| policy_loss        | -0.017078847 |
| serial_timesteps   | 95840        |
| time_elapsed       | 535          |
| total_timesteps    | 95840        |
| value_loss         | 0.000105254  |
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| approxkl          | 0.0013085781 |
| clipfrac          | 0.0078125     |
| explained_variance | -1             |
| fps               | 206           |
| n_updates          | 2996          |
| policy_entropy     | 0.30442113    |
| policy_loss        | -0.0016268572 |
| serial_timesteps   | 95872         |
| time_elapsed       | 535           |
| total_timesteps    | 95872         |
| value_loss         | 5.355775e-05  |
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| approxkl          | 0.0060858233 |
| clipfrac          | 0.10625       |
| explained_variance | 0.598         |
| fps               | 199           |
| n_updates          | 2997          |
| policy_entropy     | 0.30323502    |
| policy_loss        | -0.005724336  |
| serial_timesteps   | 95904         |
| time_elapsed       | 535           |
| total_timesteps    | 95904         |
| value_loss         | 4.452654e-05  |
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| approxkl          | 0.009501954   |
| clipfrac          | 0.0859375     |
| explained_variance | 0.365         |
| fps               | 200           |
| n_updates          | 2998          |
| policy_entropy     | 0.29551548    |
| policy_loss        | -0.013824826  |

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serial_timesteps	95936	
time_elapsed	535	
total_timesteps	95936	
value_loss	5.360195e-05	

approxkl	0.000403577	
clipfrac	0.00625	
explained_variance	-1.62	
fps	205	
n_updates	2999	
policy_entropy	0.29658964	
policy_loss	0.0002853348	
serial_timesteps	95968	
time_elapsed	535	
total_timesteps	95968	
value_loss	3.1357882e-05	

approxkl	0.003579526	
clipfrac	0.0484375	
explained_variance	0.397	
fps	188	
n_updates	3000	
policy_entropy	0.33538067	
policy_loss	-0.003315183	
serial_timesteps	96000	
time_elapsed	536	
total_timesteps	96000	
value_loss	2.5316389e-05	

approxkl	0.0032028574	
clipfrac	0.0546875	
explained_variance	-1.09	
fps	187	
n_updates	3001	
policy_entropy	0.32121056	
policy_loss	-0.012526616	
serial_timesteps	96032	
time_elapsed	536	
total_timesteps	96032	
value_loss	4.8197762e-05	

approxkl	0.004088053	
clipfrac	0.053125	
explained_variance	0.932	

fps	193	
n_updates	3002	
policy_entropy	0.31395537	
policy_loss	-0.022928845	
serial_timesteps	96064	
time_elapsed	536	
total_timesteps	96064	
value_loss	6.9472326e-06	

approxkl	0.0012344066	
clipfrac	0.0125	
explained_variance	0.267	
fps	213	
n_updates	3003	
policy_entropy	0.30481988	
policy_loss	-0.0015582022	
serial_timesteps	96096	
time_elapsed	536	
total_timesteps	96096	
value_loss	2.2083255e-05	

approxkl	0.00248692	
clipfrac	0.025	
explained_variance	-0.000417	
fps	201	
n_updates	3004	
policy_entropy	0.3147411	
policy_loss	-0.01064912	
serial_timesteps	96128	
time_elapsed	536	
total_timesteps	96128	
value_loss	95.92582	

approxkl	0.0010800066	
clipfrac	0.00625	
explained_variance	0.56	
fps	201	
n_updates	3005	
policy_entropy	0.32671162	
policy_loss	-0.009978248	
serial_timesteps	96160	
time_elapsed	536	
total_timesteps	96160	
value_loss	0.0015521104	

approxkl	0.002501666	
clipfrac	0.0328125	
explained_variance	-2.32	
fps	193	
n_updates	3006	
policy_entropy	0.28224093	
policy_loss	-0.012368351	
serial_timesteps	96192	
time_elapsed	537	
total_timesteps	96192	
value_loss	0.0003369213	

approxkl	0.0022890836	
clipfrac	0.0375	
explained_variance	0.134	
fps	197	
n_updates	3007	
policy_entropy	0.29795638	
policy_loss	-0.0027114355	
serial_timesteps	96224	
time_elapsed	537	
total_timesteps	96224	
value_loss	7.7540935e-05	

approxkl	0.0017497942	
clipfrac	0.0140625	
explained_variance	-0.151	
fps	194	
n_updates	3008	
policy_entropy	0.3193514	
policy_loss	-0.012764161	
serial_timesteps	96256	
time_elapsed	537	
total_timesteps	96256	
value_loss	0.00012588788	

approxkl	0.0043907035	
clipfrac	0.065625	
explained_variance	-1.1	
fps	203	
n_updates	3009	
policy_entropy	0.28544074	
policy_loss	-0.012417403	
serial_timesteps	96288	

time_elapsed	537	
total_timesteps	96288	
value_loss	6.1880906e-05	

approxkl	0.0017733956	
clipfrac	0.025	
explained_variance	0.547	
fps	191	
n_updates	3010	
policy_entropy	0.29749244	
policy_loss	-0.008261075	
serial_timesteps	96320	
time_elapsed	537	
total_timesteps	96320	
value_loss	5.4003893e-05	

approxkl	0.0015693435	
clipfrac	0.009375	
explained_variance	-1.5	
fps	187	
n_updates	3011	
policy_entropy	0.28010955	
policy_loss	0.0007867855	
serial_timesteps	96352	
time_elapsed	537	
total_timesteps	96352	
value_loss	3.768589e-05	

approxkl	0.0042185755	
clipfrac	0.06875	
explained_variance	0.513	
fps	195	
n_updates	3012	
policy_entropy	0.34199008	
policy_loss	-0.010932666	
serial_timesteps	96384	
time_elapsed	538	
total_timesteps	96384	
value_loss	5.6539615e-05	

approxkl	0.013118779	
clipfrac	0.1234375	
explained_variance	-0.436	
fps	195	

n_updates	3013	
policy_entropy	0.29186592	
policy_loss	-0.008280484	
serial_timesteps	96416	
time_elapsed	538	
total_timesteps	96416	
value_loss	3.3262084e-05	

approxkl	0.004251058	
clipfrac	0.06875	
explained_variance	0.846	
fps	209	
n_updates	3014	
policy_entropy	0.34367037	
policy_loss	-0.0113885375	
serial_timesteps	96448	
time_elapsed	538	
total_timesteps	96448	
value_loss	2.4984914e-05	

approxkl	0.004966449	
clipfrac	0.0578125	
explained_variance	-0.0164	
fps	198	
n_updates	3015	
policy_entropy	0.3438206	
policy_loss	-0.012423692	
serial_timesteps	96480	
time_elapsed	538	
total_timesteps	96480	
value_loss	2.8062947e-05	

approxkl	0.0012974008	
clipfrac	0.0125	
explained_variance	0.903	
fps	184	
n_updates	3016	
policy_entropy	0.3586975	
policy_loss	-0.0070383525	
serial_timesteps	96512	
time_elapsed	538	
total_timesteps	96512	
value_loss	8.0180125e-06	

approxkl	0.00195833	
clipfrac	0.025	
explained_variance	-0.254	
fps	172	
n_updates	3017	
policy_entropy	0.331964	
policy_loss	-0.0036340817	
serial_timesteps	96544	
time_elapsed	538	
total_timesteps	96544	
value_loss	2.2728009e-05	

approxkl	0.0036460545	
clipfrac	0.04375	
explained_variance	0.893	
fps	189	
n_updates	3018	
policy_entropy	0.28634435	
policy_loss	-0.006292465	
serial_timesteps	96576	
time_elapsed	539	
total_timesteps	96576	
value_loss	7.68505e-06	

approxkl	0.0028809805	
clipfrac	0.0140625	
explained_variance	0.212	
fps	180	
n_updates	3019	
policy_entropy	0.29563424	
policy_loss	-0.0119201075	
serial_timesteps	96608	
time_elapsed	539	
total_timesteps	96608	
value_loss	1.5659054e-05	

approxkl	0.0027330206	
clipfrac	0.053125	
explained_variance	-0.000613	
fps	161	
n_updates	3020	
policy_entropy	0.3442976	
policy_loss	0.008099944	
serial_timesteps	96640	
time_elapsed	539	

total_timesteps	96640	
value_loss	82.58978	

approxkl	0.006343968	
clipfrac	0.084375	
explained_variance	0.152	
fps	171	
n_updates	3021	
policy_entropy	0.35166624	
policy_loss	-0.023858722	
serial_timesteps	96672	
time_elapsed	539	
total_timesteps	96672	
value_loss	0.0026964738	

approxkl	0.00096780865	
clipfrac	0.0	
explained_variance	-0.353	
fps	189	
n_updates	3022	
policy_entropy	0.3295285	
policy_loss	0.0003203122	
serial_timesteps	96704	
time_elapsed	539	
total_timesteps	96704	
value_loss	0.0006144067	

approxkl	0.00039738728	
clipfrac	0.0	
explained_variance	-0.499	
fps	207	
n_updates	3023	
policy_entropy	0.35557637	
policy_loss	-0.00069583266	
serial_timesteps	96736	
time_elapsed	540	
total_timesteps	96736	
value_loss	0.000104487175	

approxkl	0.007901809	
clipfrac	0.1421875	
explained_variance	0.484	
fps	196	
n_updates	3024	

policy_entropy	0.33278963	
policy_loss	-0.027364582	
serial_timesteps	96768	
time_elapsed	540	
total_timesteps	96768	
value_loss	0.0001483188	

approxkl	0.0069399076	
clipfrac	0.090625	
explained_variance	-1.48	
fps	186	
n_updates	3025	
policy_entropy	0.31618673	
policy_loss	-0.009990481	
serial_timesteps	96800	
time_elapsed	540	
total_timesteps	96800	
value_loss	3.9877028e-05	

approxkl	0.0025137262	
clipfrac	0.0359375	
explained_variance	0.535	
fps	201	
n_updates	3026	
policy_entropy	0.33979344	
policy_loss	-0.0063629127	
serial_timesteps	96832	
time_elapsed	540	
total_timesteps	96832	
value_loss	4.104772e-05	

approxkl	0.000454715	
clipfrac	0.0	
explained_variance	-2.36	
fps	203	
n_updates	3027	
policy_entropy	0.29028165	
policy_loss	-0.0011325681	
serial_timesteps	96864	
time_elapsed	540	
total_timesteps	96864	
value_loss	2.8204875e-05	

approxkl	0.0022349525	
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clipfrac	0.03125	
explained_variance	0.6	
fps	195	
n_updates	3028	
policy_entropy	0.29462123	
policy_loss	-0.009422287	
serial_timesteps	96896	
time_elapsed	540	
total_timesteps	96896	
value_loss	3.11358e-05	

approxkl	0.00806244	
clipfrac	0.10625	
explained_variance	-1.1	
fps	193	
n_updates	3029	
policy_entropy	0.25446615	
policy_loss	-0.01197207	
serial_timesteps	96928	
time_elapsed	540	
total_timesteps	96928	
value_loss	2.474365e-05	

approxkl	0.0036837147	
clipfrac	0.046875	
explained_variance	-0.712	
fps	192	
n_updates	3030	
policy_entropy	0.31965488	
policy_loss	-0.024463702	
serial_timesteps	96960	
time_elapsed	541	
total_timesteps	96960	
value_loss	3.2053933e-05	

approxkl	0.0012826569	
clipfrac	0.0046875	
explained_variance	-0.172	
fps	195	
n_updates	3031	
policy_entropy	0.344985	
policy_loss	-0.00085048674	
serial_timesteps	96992	
time_elapsed	541	
total_timesteps	96992	

value_loss	1.033449e-05	

approxkl	0.001231306	
clipfrac	0.015625	
explained_variance	0.407	
fps	195	
n_updates	3032	
policy_entropy	0.28057343	
policy_loss	-0.003441602	
serial_timesteps	97024	
time_elapsed	541	
total_timesteps	97024	
value_loss	1.6065453e-05	

approxkl	0.012337344	
clipfrac	0.1203125	
explained_variance	-1.5	
fps	205	
n_updates	3033	
policy_entropy	0.23150603	
policy_loss	-0.020228526	
serial_timesteps	97056	
time_elapsed	541	
total_timesteps	97056	
value_loss	8.03741e-06	

approxkl	0.0063086078	
clipfrac	0.0671875	
explained_variance	-1.45	
fps	206	
n_updates	3034	
policy_entropy	0.28583026	
policy_loss	-0.00945304	
serial_timesteps	97088	
time_elapsed	541	
total_timesteps	97088	
value_loss	9.361602e-06	

approxkl	0.004421292	
clipfrac	0.0625	
explained_variance	-0.000214	
fps	197	
n_updates	3035	
policy_entropy	0.3252409	

policy_loss	-0.016130086	
serial_timesteps	97120	
time_elapsed	541	
total_timesteps	97120	
value_loss	96.047035	

approxkl	0.018916111	
clipfrac	0.1015625	
explained_variance	-0.736	
fps	198	
n_updates	3036	
policy_entropy	0.26645508	
policy_loss	-0.02215698	
serial_timesteps	97152	
time_elapsed	542	
total_timesteps	97152	
value_loss	0.0003641111	

approxkl	0.014835773	
clipfrac	0.1203125	
explained_variance	0.289	
fps	187	
n_updates	3037	
policy_entropy	0.26420113	
policy_loss	-0.01369557	
serial_timesteps	97184	
time_elapsed	542	
total_timesteps	97184	
value_loss	0.00025210626	

approxkl	0.0016017556	
clipfrac	0.0234375	
explained_variance	-0.893	
fps	187	
n_updates	3038	
policy_entropy	0.26152247	
policy_loss	-0.004834797	
serial_timesteps	97216	
time_elapsed	542	
total_timesteps	97216	
value_loss	0.00017294491	

approxkl	0.010976722	
clipfrac	0.0890625	

explained_variance	0.47	
fps	174	
n_updates	3039	
policy_entropy	0.3054213	
policy_loss	-0.019407183	
serial_timesteps	97248	
time_elapsed	542	
total_timesteps	97248	
value_loss	6.966894e-05	

approxkl	0.019967893	
clipfrac	0.1765625	
explained_variance	-1.17	
fps	187	
n_updates	3040	
policy_entropy	0.3105134	
policy_loss	-0.014425149	
serial_timesteps	97280	
time_elapsed	542	
total_timesteps	97280	
value_loss	8.2177765e-05	

approxkl	0.006493888	
clipfrac	0.1	
explained_variance	0.369	
fps	197	
n_updates	3041	
policy_entropy	0.3239459	
policy_loss	-0.012504783	
serial_timesteps	97312	
time_elapsed	542	
total_timesteps	97312	
value_loss	6.19231e-05	

approxkl	0.011453525	
clipfrac	0.171875	
explained_variance	-0.83	
fps	167	
n_updates	3042	
policy_entropy	0.33638555	
policy_loss	-0.015093073	
serial_timesteps	97344	
time_elapsed	543	
total_timesteps	97344	
value_loss	4.59905e-05	

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| approxkl          | 0.0056688837 |
| clipfrac          | 0.0609375     |
| explained_variance | 0.381          |
| fps               | 190            |
| n_updates          | 3043           |
| policy_entropy     | 0.27905768     |
| policy_loss        | -0.004607712   |
| serial_timesteps   | 97376          |
| time_elapsed       | 543            |
| total_timesteps    | 97376          |
| value_loss         | 2.5348661e-05 |
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| approxkl          | 0.0023264275 |
| clipfrac          | 0.0328125     |
| explained_variance | -0.171         |
| fps               | 192            |
| n_updates          | 3044           |
| policy_entropy     | 0.28738013     |
| policy_loss        | -0.007716852   |
| serial_timesteps   | 97408          |
| time_elapsed       | 543            |
| total_timesteps    | 97408          |
| value_loss         | 3.2573e-05     |
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| approxkl          | 0.012139603   |
| clipfrac          | 0.240625       |
| explained_variance | -0.237         |
| fps               | 199            |
| n_updates          | 3045           |
| policy_entropy     | 0.3533781      |
| policy_loss        | -0.0115894545  |
| serial_timesteps   | 97440          |
| time_elapsed       | 543            |
| total_timesteps    | 97440          |
| value_loss         | 3.0171359e-05 |
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| approxkl          | 0.0029604156   |
| clipfrac          | 0.028125       |
| explained_variance | -0.0786        |
| fps               | 178            |
| n_updates          | 3046           |
| policy_entropy     | 0.2915222      |
| policy_loss        | -0.00092421717 |
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serial_timesteps	97472	
time_elapsed	543	
total_timesteps	97472	
value_loss	1.4822331e-05	

approxkl	0.004390803	
clipfrac	0.071875	
explained_variance	-0.276	
fps	189	
n_updates	3047	
policy_entropy	0.2895576	
policy_loss	-0.004263102	
serial_timesteps	97504	
time_elapsed	544	
total_timesteps	97504	
value_loss	1.8246776e-05	

approxkl	0.019455474	
clipfrac	0.1515625	
explained_variance	0.589	
fps	180	
n_updates	3048	
policy_entropy	0.29692265	
policy_loss	-0.011885638	
serial_timesteps	97536	
time_elapsed	544	
total_timesteps	97536	
value_loss	1.3996952e-05	

approxkl	0.010493783	
clipfrac	0.1703125	
explained_variance	-2.53	
fps	167	
n_updates	3049	
policy_entropy	0.2905937	
policy_loss	-0.005014277	
serial_timesteps	97568	
time_elapsed	544	
total_timesteps	97568	
value_loss	1.1389951e-05	

approxkl	0.0036337222	
clipfrac	0.0546875	
explained_variance	0.489	

fps	175	
n_updates	3050	
policy_entropy	0.2711804	
policy_loss	-0.006494311	
serial_timesteps	97600	
time_elapsed	544	
total_timesteps	97600	
value_loss	1.0979109e-05	

approxkl	0.0002842291	
clipfrac	0.003125	
explained_variance	-0.000616	
fps	163	
n_updates	3051	
policy_entropy	0.28160983	
policy_loss	-0.001757975	
serial_timesteps	97632	
time_elapsed	544	
total_timesteps	97632	
value_loss	95.79105	

approxkl	0.0028525474	
clipfrac	0.04375	
explained_variance	-0.315	
fps	170	
n_updates	3052	
policy_entropy	0.29329425	
policy_loss	-0.015928183	
serial_timesteps	97664	
time_elapsed	544	
total_timesteps	97664	
value_loss	0.0008874516	

approxkl	0.01031097	
clipfrac	0.10625	
explained_variance	0.225	
fps	184	
n_updates	3053	
policy_entropy	0.28298014	
policy_loss	-0.009740821	
serial_timesteps	97696	
time_elapsed	545	
total_timesteps	97696	
value_loss	0.0001794819	

approxkl	0.0149890985	
clipfrac	0.1609375	
explained_variance	-0.615	
fps	165	
n_updates	3054	
policy_entropy	0.2976746	
policy_loss	-0.015717098	
serial_timesteps	97728	
time_elapsed	545	
total_timesteps	97728	
value_loss	5.412414e-05	

approxkl	0.01699369	
clipfrac	0.1546875	
explained_variance	-0.299	
fps	160	
n_updates	3055	
policy_entropy	0.27114365	
policy_loss	-0.010222171	
serial_timesteps	97760	
time_elapsed	545	
total_timesteps	97760	
value_loss	3.6998525e-05	

approxkl	0.008354808	
clipfrac	0.14375	
explained_variance	0.248	
fps	151	
n_updates	3056	
policy_entropy	0.3172567	
policy_loss	-0.010145709	
serial_timesteps	97792	
time_elapsed	545	
total_timesteps	97792	
value_loss	4.4956287e-05	

approxkl	0.010993274	
clipfrac	0.18125	
explained_variance	-0.879	
fps	165	
n_updates	3057	
policy_entropy	0.31490967	
policy_loss	-0.025946517	
serial_timesteps	97824	

time_elapsed	545	
total_timesteps	97824	
value_loss	3.3296652e-05	

approxkl	0.017071433	
clipfrac	0.1796875	
explained_variance	0.408	
fps	179	
n_updates	3058	
policy_entropy	0.32746157	
policy_loss	-0.029590163	
serial_timesteps	97856	
time_elapsed	546	
total_timesteps	97856	
value_loss	1.8935603e-05	

approxkl	0.0092708375	
clipfrac	0.115625	
explained_variance	-0.999	
fps	159	
n_updates	3059	
policy_entropy	0.3304082	
policy_loss	-0.0043010535	
serial_timesteps	97888	
time_elapsed	546	
total_timesteps	97888	
value_loss	1.6400938e-05	

approxkl	0.0064917756	
clipfrac	0.1078125	
explained_variance	0.208	
fps	157	
n_updates	3060	
policy_entropy	0.30468586	
policy_loss	-0.006349242	
serial_timesteps	97920	
time_elapsed	546	
total_timesteps	97920	
value_loss	1.6212152e-05	

approxkl	0.0071726963	
clipfrac	0.0671875	
explained_variance	-1.24	
fps	160	

n_updates	3061	
policy_entropy	0.31026852	
policy_loss	-0.015801001	
serial_timesteps	97952	
time_elapsed	546	
total_timesteps	97952	
value_loss	2.016588e-05	

approxkl	0.015742395	
clipfrac	0.0671875	
explained_variance	-0.283	
fps	164	
n_updates	3062	
policy_entropy	0.27745688	
policy_loss	-0.022634203	
serial_timesteps	97984	
time_elapsed	546	
total_timesteps	97984	
value_loss	8.768683e-06	

approxkl	0.0027312222	
clipfrac	0.040625	
explained_variance	0.557	
fps	155	
n_updates	3063	
policy_entropy	0.3344697	
policy_loss	-0.00014946153	
serial_timesteps	98016	
time_elapsed	547	
total_timesteps	98016	
value_loss	4.5231495e-06	

approxkl	0.0042014373	
clipfrac	0.0359375	
explained_variance	-2.56	
fps	161	
n_updates	3064	
policy_entropy	0.3044281	
policy_loss	-0.009992421	
serial_timesteps	98048	
time_elapsed	547	
total_timesteps	98048	
value_loss	6.6079024e-06	

approxkl	0.004403628	
clipfrac	0.0828125	
explained_variance	0.587	
fps	176	
n_updates	3065	
policy_entropy	0.26315385	
policy_loss	-0.0013562308	
serial_timesteps	98080	
time_elapsed	547	
total_timesteps	98080	
value_loss	3.8173903e-06	

approxkl	0.004259522	
clipfrac	0.05	
explained_variance	-5.46e-05	
fps	197	
n_updates	3066	
policy_entropy	0.25997943	
policy_loss	-0.0036903347	
serial_timesteps	98112	
time_elapsed	547	
total_timesteps	98112	
value_loss	96.101074	

approxkl	0.011001014	
clipfrac	0.1015625	
explained_variance	-1.37	
fps	192	
n_updates	3067	
policy_entropy	0.25244772	
policy_loss	-0.013728368	
serial_timesteps	98144	
time_elapsed	547	
total_timesteps	98144	
value_loss	0.0005517259	

approxkl	0.012570461	
clipfrac	0.0953125	
explained_variance	0.2	
fps	200	
n_updates	3068	
policy_entropy	0.3116948	
policy_loss	-0.023440566	
serial_timesteps	98176	
time_elapsed	548	

total_timesteps	98176	
value_loss	0.00044916914	

approxkl	0.003131428	
clipfrac	0.0328125	
explained_variance	-0.693	
fps	186	
n_updates	3069	
policy_entropy	0.25944182	
policy_loss	-0.010797774	
serial_timesteps	98208	
time_elapsed	548	
total_timesteps	98208	
value_loss	8.541103e-05	

approxkl	0.005150197	
clipfrac	0.0828125	
explained_variance	0.259	
fps	185	
n_updates	3070	
policy_entropy	0.29534298	
policy_loss	-0.00387817	
serial_timesteps	98240	
time_elapsed	548	
total_timesteps	98240	
value_loss	0.0001147012	

approxkl	0.008526851	
clipfrac	0.14375	
explained_variance	-0.565	
fps	194	
n_updates	3071	
policy_entropy	0.32883263	
policy_loss	-0.013202934	
serial_timesteps	98272	
time_elapsed	548	
total_timesteps	98272	
value_loss	0.00015180642	

approxkl	0.0037705232	
clipfrac	0.04375	
explained_variance	0.167	
fps	194	
n_updates	3072	

policy_entropy	0.31832176	
policy_loss	-0.016951773	
serial_timesteps	98304	
time_elapsed	548	
total_timesteps	98304	
value_loss	5.437778e-05	

approxkl	0.0061763856	
clipfrac	0.0875	
explained_variance	-0.0467	
fps	197	
n_updates	3073	
policy_entropy	0.31051552	
policy_loss	-0.017585764	
serial_timesteps	98336	
time_elapsed	548	
total_timesteps	98336	
value_loss	5.89176e-05	

approxkl	0.013998574	
clipfrac	0.1734375	
explained_variance	0.335	
fps	200	
n_updates	3074	
policy_entropy	0.2978405	
policy_loss	-0.02121288	
serial_timesteps	98368	
time_elapsed	549	
total_timesteps	98368	
value_loss	5.1089086e-05	

approxkl	0.011630445	
clipfrac	0.084375	
explained_variance	-0.788	
fps	189	
n_updates	3075	
policy_entropy	0.3034714	
policy_loss	-0.00791922	
serial_timesteps	98400	
time_elapsed	549	
total_timesteps	98400	
value_loss	2.786503e-05	

approxkl	0.01740925	
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clipfrac	0.2171875	
explained_variance	0.434	
fps	192	
n_updates	3076	
policy_entropy	0.3232848	
policy_loss	-0.035248507	
serial_timesteps	98432	
time_elapsed	549	
total_timesteps	98432	
value_loss	5.0446564e-05	

approxkl	0.005729411	
clipfrac	0.090625	
explained_variance	-1.15	
fps	200	
n_updates	3077	
policy_entropy	0.31034133	
policy_loss	-0.004550673	
serial_timesteps	98464	
time_elapsed	549	
total_timesteps	98464	
value_loss	2.0234267e-05	

approxkl	0.015093672	
clipfrac	0.2078125	
explained_variance	0.215	
fps	200	
n_updates	3078	
policy_entropy	0.3500319	
policy_loss	-0.02902248	
serial_timesteps	98496	
time_elapsed	549	
total_timesteps	98496	
value_loss	2.3515686e-05	

approxkl	0.0024441287	
clipfrac	0.0359375	
explained_variance	0.00954	
fps	181	
n_updates	3079	
policy_entropy	0.3455046	
policy_loss	-0.0012028265	
serial_timesteps	98528	
time_elapsed	549	
total_timesteps	98528	

value_loss	1.0442929e-05	
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approxkl	0.011039133	
clipfrac	0.1140625	
explained_variance	-0.538	
fps	187	
n_updates	3080	
policy_entropy	0.3279652	
policy_loss	-0.0038785771	
serial_timesteps	98560	
time_elapsed	550	
total_timesteps	98560	
value_loss	1.0433471e-05	

approxkl	0.0043987366	
clipfrac	0.0984375	
explained_variance	-0.0307	
fps	191	
n_updates	3081	
policy_entropy	0.32333854	
policy_loss	-0.0034224894	
serial_timesteps	98592	
time_elapsed	550	
total_timesteps	98592	
value_loss	9.125727e-06	

approxkl	0.0037867627	
clipfrac	0.065625	
explained_variance	-0.00025	
fps	193	
n_updates	3082	
policy_entropy	0.29321107	
policy_loss	-0.006829144	
serial_timesteps	98624	
time_elapsed	550	
total_timesteps	98624	
value_loss	96.00438	

approxkl	0.017417904	
clipfrac	0.203125	
explained_variance	-0.194	
fps	187	
n_updates	3083	
policy_entropy	0.31720766	

policy_loss	-0.03727776	
serial_timesteps	98656	
time_elapsed	550	
total_timesteps	98656	
value_loss	0.00013731398	

approxkl	0.0033862002	
clipfrac	0.046875	
explained_variance	-0.154	
fps	186	
n_updates	3084	
policy_entropy	0.32326612	
policy_loss	-0.0024456603	
serial_timesteps	98688	
time_elapsed	550	
total_timesteps	98688	
value_loss	0.00017401448	

approxkl	0.011511657	
clipfrac	0.1046875	
explained_variance	-0.0184	
fps	153	
n_updates	3085	
policy_entropy	0.2894634	
policy_loss	-0.009309833	
serial_timesteps	98720	
time_elapsed	550	
total_timesteps	98720	
value_loss	0.00019406101	

approxkl	0.010334643	
clipfrac	0.11875	
explained_variance	-0.223	
fps	185	
n_updates	3086	
policy_entropy	0.34435815	
policy_loss	-0.025008792	
serial_timesteps	98752	
time_elapsed	551	
total_timesteps	98752	
value_loss	0.00033321156	

approxkl	0.0036041364	
clipfrac	0.0515625	

explained_variance	0.0211	
fps	188	
n_updates	3087	
policy_entropy	0.28950176	
policy_loss	-0.00723406	
serial_timesteps	98784	
time_elapsed	551	
total_timesteps	98784	
value_loss	6.2457104e-05	

approxkl	0.005700302	
clipfrac	0.103125	
explained_variance	-0.0618	
fps	191	
n_updates	3088	
policy_entropy	0.3375752	
policy_loss	-0.006956432	
serial_timesteps	98816	
time_elapsed	551	
total_timesteps	98816	
value_loss	8.858543e-05	

approxkl	0.014843157	
clipfrac	0.2546875	
explained_variance	-0.608	
fps	203	
n_updates	3089	
policy_entropy	0.33802968	
policy_loss	-0.019243002	
serial_timesteps	98848	
time_elapsed	551	
total_timesteps	98848	
value_loss	9.782987e-05	

approxkl	0.011390719	
clipfrac	0.1671875	
explained_variance	0.031	
fps	182	
n_updates	3090	
policy_entropy	0.3338972	
policy_loss	-0.00363053	
serial_timesteps	98880	
time_elapsed	551	
total_timesteps	98880	
value_loss	4.6039495e-05	

```

-----
| approxkl          | 0.0026820954 |
| clipfrac          | 0.0125        |
| explained_variance | -0.0094       |
| fps               | 155           |
| n_updates          | 3091          |
| policy_entropy     | 0.36096457    |
| policy_loss        | -0.00092751125 |
| serial_timesteps   | 98912         |
| time_elapsed       | 551           |
| total_timesteps    | 98912         |
| value_loss         | 4.5185152e-05 |
-----

```

```

-----
| approxkl          | 0.00619021    |
| clipfrac          | 0.09375       |
| explained_variance | -0.545        |
| fps               | 167           |
| n_updates          | 3092          |
| policy_entropy     | 0.3020934     |
| policy_loss        | -0.001944545  |
| serial_timesteps   | 98944         |
| time_elapsed       | 552           |
| total_timesteps    | 98944         |
| value_loss         | 3.7545768e-05 |
-----

```

```

-----
| approxkl          | 0.0050339876  |
| clipfrac          | 0.0953125     |
| explained_variance | 0.00691       |
| fps               | 162           |
| n_updates          | 3093          |
| policy_entropy     | 0.32820845    |
| policy_loss        | -0.0031567174 |
| serial_timesteps   | 98976         |
| time_elapsed       | 552           |
| total_timesteps    | 98976         |
| value_loss         | 2.9268751e-05 |
-----

```

```

-----
| approxkl          | 0.028181732   |
| clipfrac          | 0.23125       |
| explained_variance | -0.162        |
| fps               | 166           |
| n_updates          | 3094          |
| policy_entropy     | 0.34241137    |
| policy_loss        | -0.01803251   |

```

serial_timesteps	99008	
time_elapsed	552	
total_timesteps	99008	
value_loss	3.800665e-05	

approxkl	0.028287629	
clipfrac	0.2484375	
explained_variance	-0.0804	
fps	142	
n_updates	3095	
policy_entropy	0.36549315	
policy_loss	-0.024684597	
serial_timesteps	99040	
time_elapsed	552	
total_timesteps	99040	
value_loss	2.631227e-05	

approxkl	0.0064718733	
clipfrac	0.0921875	
explained_variance	-0.148	
fps	154	
n_updates	3096	
policy_entropy	0.36584648	
policy_loss	-0.007655041	
serial_timesteps	99072	
time_elapsed	552	
total_timesteps	99072	
value_loss	1.7379996e-05	

approxkl	0.0074867667	
clipfrac	0.0703125	
explained_variance	-0.276	
fps	160	
n_updates	3097	
policy_entropy	0.35832533	
policy_loss	-0.0049591376	
serial_timesteps	99104	
time_elapsed	553	
total_timesteps	99104	
value_loss	1.0199303e-05	

approxkl	0.0015023943	
clipfrac	0.0125	
explained_variance	-0.000233	

fps	153	
n_updates	3098	
policy_entropy	0.40373382	
policy_loss	-0.013254566	
serial_timesteps	99136	
time_elapsed	553	
total_timesteps	99136	
value_loss	94.12816	

approxkl	0.009524273	
clipfrac	0.1609375	
explained_variance	0.0109	
fps	169	
n_updates	3099	
policy_entropy	0.41807503	
policy_loss	-0.011502981	
serial_timesteps	99168	
time_elapsed	553	
total_timesteps	99168	
value_loss	0.0012912785	

approxkl	0.011498911	
clipfrac	0.1359375	
explained_variance	-0.253	
fps	148	
n_updates	3100	
policy_entropy	0.3227983	
policy_loss	-0.019595686	
serial_timesteps	99200	
time_elapsed	553	
total_timesteps	99200	
value_loss	0.0007381184	

approxkl	0.009493458	
clipfrac	0.1609375	
explained_variance	-0.274	
fps	160	
n_updates	3101	
policy_entropy	0.38892668	
policy_loss	-0.020006055	
serial_timesteps	99232	
time_elapsed	553	
total_timesteps	99232	
value_loss	0.00011739517	

approxkl	0.009868245	
clipfrac	0.08125	
explained_variance	0.583	
fps	162	
n_updates	3102	
policy_entropy	0.3126704	
policy_loss	-0.013230768	
serial_timesteps	99264	
time_elapsed	554	
total_timesteps	99264	
value_loss	0.00015528951	

approxkl	0.0066198455	
clipfrac	0.1234375	
explained_variance	0.0351	
fps	151	
n_updates	3103	
policy_entropy	0.40162665	
policy_loss	-0.005079645	
serial_timesteps	99296	
time_elapsed	554	
total_timesteps	99296	
value_loss	6.6451736e-05	

approxkl	0.0074750967	
clipfrac	0.1078125	
explained_variance	-0.39	
fps	160	
n_updates	3104	
policy_entropy	0.36032933	
policy_loss	-0.005849707	
serial_timesteps	99328	
time_elapsed	554	
total_timesteps	99328	
value_loss	6.6353336e-05	

approxkl	0.0058842157	
clipfrac	0.0953125	
explained_variance	-0.407	
fps	154	
n_updates	3105	
policy_entropy	0.35992575	
policy_loss	-0.0033171996	
serial_timesteps	99360	

time_elapsed	554	
total_timesteps	99360	
value_loss	5.23244e-05	

approxkl	0.01234796	
clipfrac	0.2578125	
explained_variance	-0.284	
fps	159	
n_updates	3106	
policy_entropy	0.36940023	
policy_loss	-0.015975317	
serial_timesteps	99392	
time_elapsed	554	
total_timesteps	99392	
value_loss	5.6777633e-05	

approxkl	0.0019531571	
clipfrac	0.025	
explained_variance	-0.343	
fps	160	
n_updates	3107	
policy_entropy	0.40123826	
policy_loss	-0.0031396463	
serial_timesteps	99424	
time_elapsed	555	
total_timesteps	99424	
value_loss	2.5462286e-05	

approxkl	0.04313964	
clipfrac	0.3046875	
explained_variance	-0.269	
fps	149	
n_updates	3108	
policy_entropy	0.3760172	
policy_loss	-0.018738596	
serial_timesteps	99456	
time_elapsed	555	
total_timesteps	99456	
value_loss	3.642786e-05	

approxkl	0.004816125	
clipfrac	0.06875	
explained_variance	-0.63	
fps	165	

n_updates	3109	
policy_entropy	0.41359854	
policy_loss	-0.007637332	
serial_timesteps	99488	
time_elapsed	555	
total_timesteps	99488	
value_loss	2.9043513e-05	

approxkl	0.026777292	
clipfrac	0.2421875	
explained_variance	-0.822	
fps	160	
n_updates	3110	
policy_entropy	0.40341434	
policy_loss	-0.019286718	
serial_timesteps	99520	
time_elapsed	555	
total_timesteps	99520	
value_loss	1.6711267e-05	

approxkl	0.0034771562	
clipfrac	0.05625	
explained_variance	0.281	
fps	187	
n_updates	3111	
policy_entropy	0.3973766	
policy_loss	-0.0039746733	
serial_timesteps	99552	
time_elapsed	555	
total_timesteps	99552	
value_loss	1.11719555e-05	

approxkl	0.0032821975	
clipfrac	0.034375	
explained_variance	-1.21	
fps	190	
n_updates	3112	
policy_entropy	0.4203562	
policy_loss	-0.006461804	
serial_timesteps	99584	
time_elapsed	556	
total_timesteps	99584	
value_loss	1.349436e-05	

approxkl	0.0015741099	
clipfrac	0.01875	
explained_variance	-0.000194	
fps	168	
n_updates	3113	
policy_entropy	0.36613715	
policy_loss	-0.0031536035	
serial_timesteps	99616	
time_elapsed	556	
total_timesteps	99616	
value_loss	95.96549	

approxkl	0.02017067	
clipfrac	0.14375	
explained_variance	-0.267	
fps	167	
n_updates	3114	
policy_entropy	0.36953425	
policy_loss	-0.018744275	
serial_timesteps	99648	
time_elapsed	556	
total_timesteps	99648	
value_loss	0.0002527072	

approxkl	0.011844421	
clipfrac	0.1109375	
explained_variance	0.0508	
fps	166	
n_updates	3115	
policy_entropy	0.35004067	
policy_loss	-0.0083715515	
serial_timesteps	99680	
time_elapsed	556	
total_timesteps	99680	
value_loss	0.00031141835	

approxkl	0.009192717	
clipfrac	0.1625	
explained_variance	-0.0163	
fps	176	
n_updates	3116	
policy_entropy	0.37190682	
policy_loss	-0.022921333	
serial_timesteps	99712	
time_elapsed	556	

total_timesteps	99712	
value_loss	0.00039176265	

approxkl	0.009993683	
clipfrac	0.1234375	
explained_variance	-0.182	
fps	178	
n_updates	3117	
policy_entropy	0.39590976	
policy_loss	-0.030974273	
serial_timesteps	99744	
time_elapsed	557	
total_timesteps	99744	
value_loss	0.00015763387	

approxkl	0.006605164	
clipfrac	0.05625	
explained_variance	0.311	
fps	194	
n_updates	3118	
policy_entropy	0.3744282	
policy_loss	-0.020237232	
serial_timesteps	99776	
time_elapsed	557	
total_timesteps	99776	
value_loss	0.00014245803	

approxkl	0.0076524527	
clipfrac	0.1234375	
explained_variance	-0.712	
fps	209	
n_updates	3119	
policy_entropy	0.3892045	
policy_loss	-0.008778298	
serial_timesteps	99808	
time_elapsed	557	
total_timesteps	99808	
value_loss	0.000101398444	

approxkl	0.001336088	
clipfrac	0.0140625	
explained_variance	-0.14	
fps	167	
n_updates	3120	

policy_entropy	0.40908974	
policy_loss	-0.0015121625	
serial_timesteps	99840	
time_elapsed	557	
total_timesteps	99840	
value_loss	9.080114e-05	

approxkl	0.014394107	
clipfrac	0.1375	
explained_variance	0.569	
fps	184	
n_updates	3121	
policy_entropy	0.32842106	
policy_loss	-0.027694602	
serial_timesteps	99872	
time_elapsed	557	
total_timesteps	99872	
value_loss	0.00010062483	

approxkl	0.0066154553	
clipfrac	0.128125	
explained_variance	-0.942	
fps	177	
n_updates	3122	
policy_entropy	0.40306932	
policy_loss	-0.00485877	
serial_timesteps	99904	
time_elapsed	557	
total_timesteps	99904	
value_loss	5.527157e-05	

approxkl	0.007872483	
clipfrac	0.1890625	
explained_variance	0.253	
fps	166	
n_updates	3123	
policy_entropy	0.4369511	
policy_loss	-0.00886642	
serial_timesteps	99936	
time_elapsed	558	
total_timesteps	99936	
value_loss	5.7412788e-05	

approxkl	0.010086086	
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clipfrac	0.1734375	
explained_variance	0.072	
fps	200	
n_updates	3124	
policy_entropy	0.41442457	
policy_loss	-0.0120537225	
serial_timesteps	99968	
time_elapsed	558	
total_timesteps	99968	
value_loss	5.2831725e-05	

approxkl	0.011324756	
clipfrac	0.2046875	
explained_variance	-0.619	
fps	201	
n_updates	3125	
policy_entropy	0.4584201	
policy_loss	-0.006831056	
serial_timesteps	100000	
time_elapsed	558	
total_timesteps	100000	
value_loss	2.730745e-05	

```
[29]: mean_reward_ppo, std_reward_ppo = evaluate_policy(ppo, env, n_eval_episodes=100)
      print(f"mean_reward_ppo: {mean_reward_ppo:.2f} +/- {std_reward_ppo:.2f}")
```

```
mean_reward_ppo: 500.00 +/- 0.00
```

```
[30]: record_video('CartPole-v1', ppo, video_length=500, prefix='ppo-cartpole')
```

```
Saving video to /content/videos/ppo-cartpole-step-0-to-step-500.mp4
```

```
[31]: show_videos('videos', prefix='ppo-cartpole')
```

```
<IPython.core.display.HTML object>
```

7 Evaluate Models

```
[32]: %load_ext tensorboard
      %tensorboard --logdir logs
```

```
<IPython.core.display.HTML object>
```