training_overview_1643390569.2872791

February 1, 2022

[ ]:

```
import pandas as pd
import os
import matplotlib.pyplot as plt

TIMESTAMP = '1643390569.2872791'
DATA_DIRECTORY = '/run/media/ture/Backup Plus/data/2022-01-29_server_training/'

perf_data = pd.read_csv(os.path.join(DATA_DIRECTORY,␣
 ↪f'{TIMESTAMP}_performance_stats.csv'))
perf_data['timestamp'] = pd.to_datetime(perf_data['timestamp'])
perf_data.head()
```

[ ]:

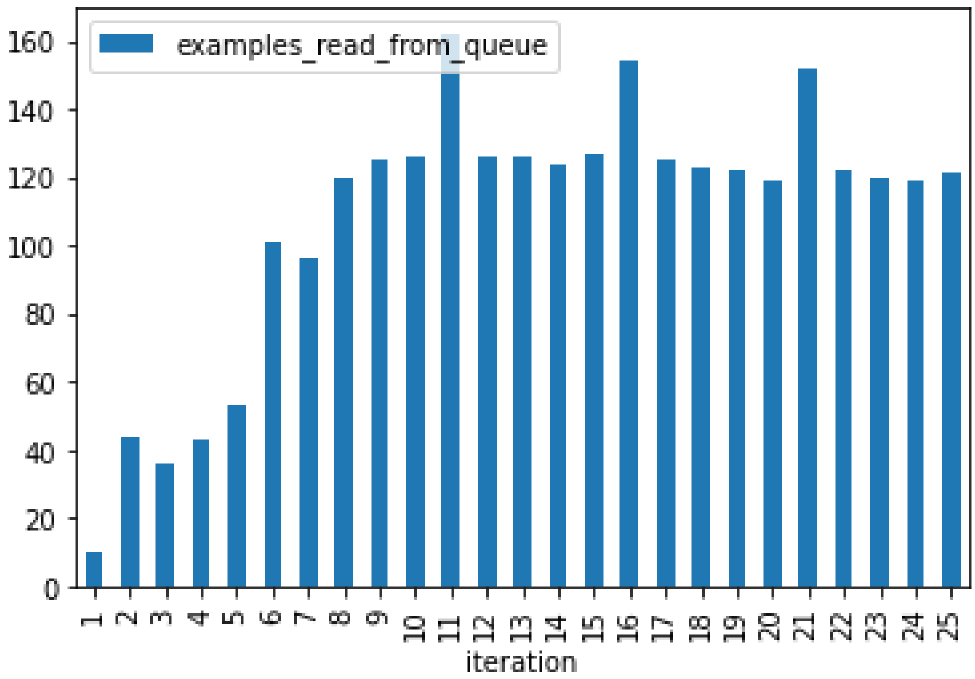
```
   iteration                     timestamp  iteration_duration  \
0          1 1970-01-01 00:00:01.643392298         1235.374931
1          2 1970-01-01 00:00:01.643393232          934.307589
2          3 1970-01-01 00:00:01.643394449         1216.475921
3          4 1970-01-01 00:00:01.643395996         1547.219904
4          5 1970-01-01 00:00:01.643398922         2925.872467

   training_duration  examples_read_from_queue  length_experience_buffer
0          74.591349                        10                     24070
1         402.828289                        44                    129973
2         673.190331                        36                    216625
3         992.436172                        43                    320126
4        1388.638523                        53                    447697
```

[ ]:

```
perf_data.plot.bar(x='iteration', y='examples_read_from_queue')
```

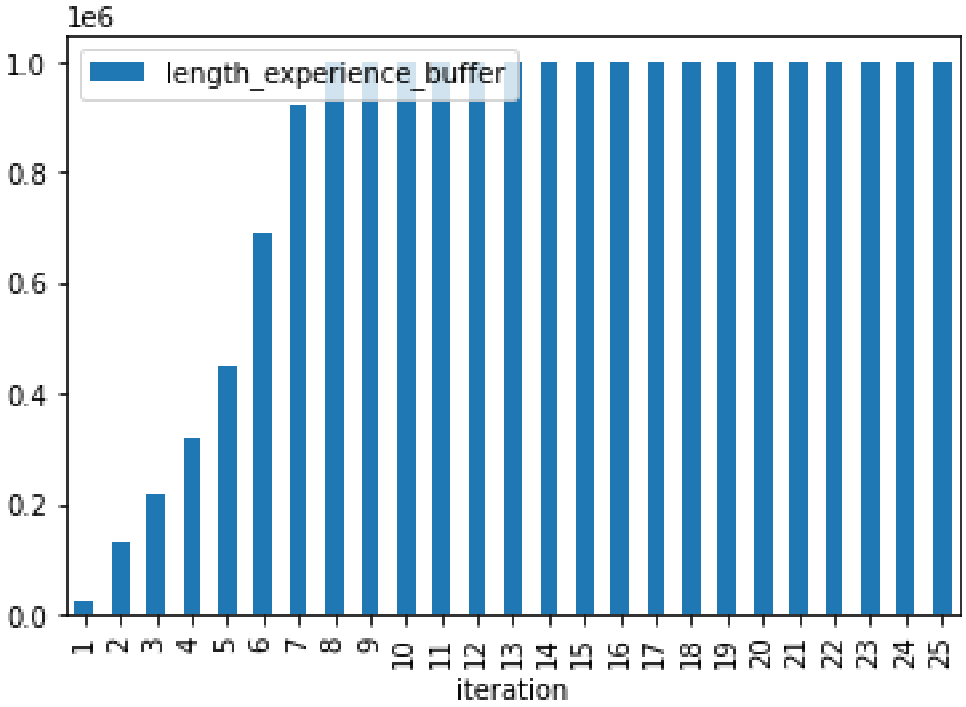
[ ]:

```
<AxesSubplot:xlabel='iteration'>
```



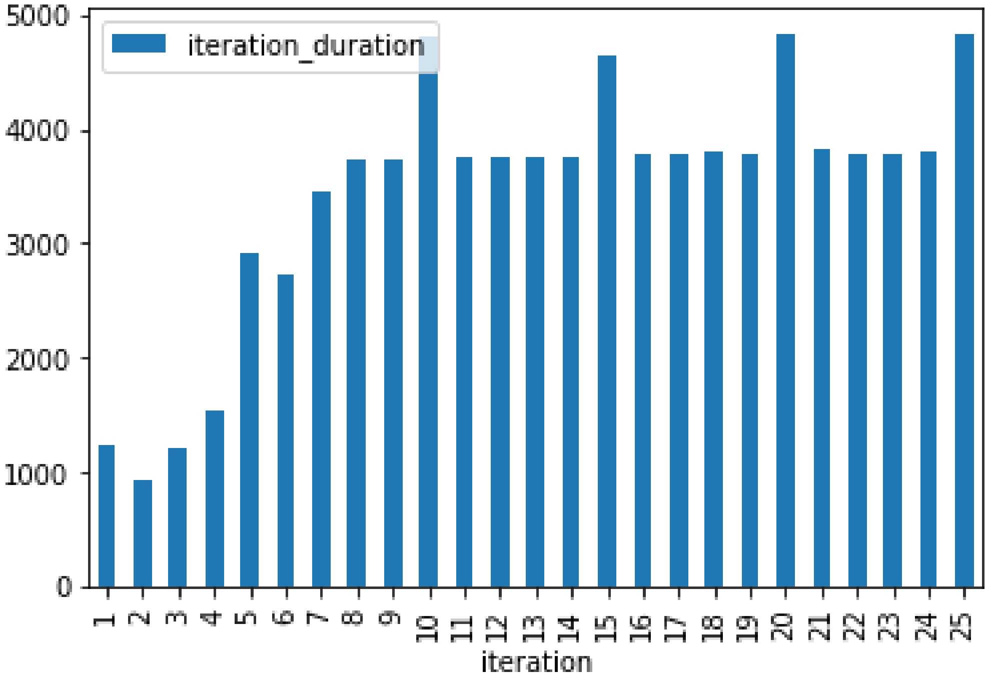
```
[ ]: perf_data.plot.bar(x='iteration', y='length_experience_buffer')
```

```
[ ]: <AxesSubplot:xlabel='iteration'>
```



```
[ ]: perf_data.plot.bar(x='iteration', y='iteration_duration')
```

```
[ ]: <AxesSubplot:xlabel='iteration'>
```



```
[ ]: rndm_data = pd.read_csv(os.path.join(DATA_DIRECTORY,␣
      ↪f'{TIMESTAMP}_random_player_game_stats.csv'))
     rndm_data['timestamp'] = pd.to_datetime(perf_data['timestamp'])
     rndm_data.set_index('iteration')
     rndm_data.head()
```

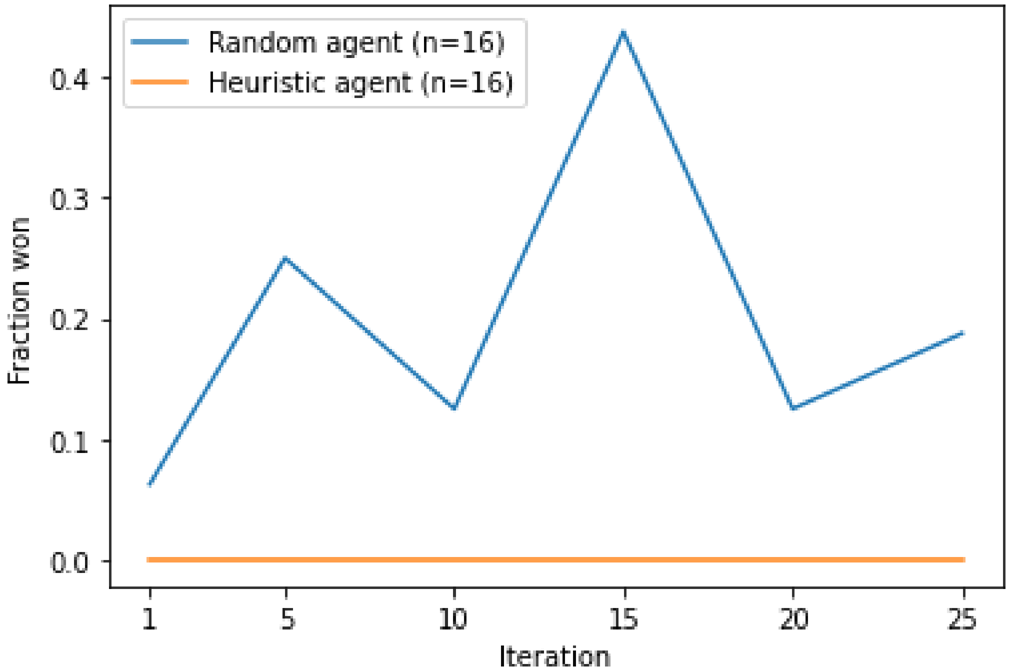
```
[ ]:    iteration                     timestamp  wins  losses  draws  \
     0          1 1970-01-01 00:00:01.643392298   1.0     4.0   11.0
     1          5 1970-01-01 00:00:01.643393232   4.0     5.0    7.0
     2         10 1970-01-01 00:00:01.643394449   2.0     6.0    8.0
     3         15 1970-01-01 00:00:01.643395996   7.0     3.0    6.0
     4         20 1970-01-01 00:00:01.643398922   2.0     2.0   12.0

        nnet_cumul_rewards  random_cumul_rewards
     0           -0.666667              0.666667
     1           -0.333333              0.333333
     2           -0.500000              0.500000
     3            1.000000             -1.000000
```

```
4          0.000000             0.000000
```

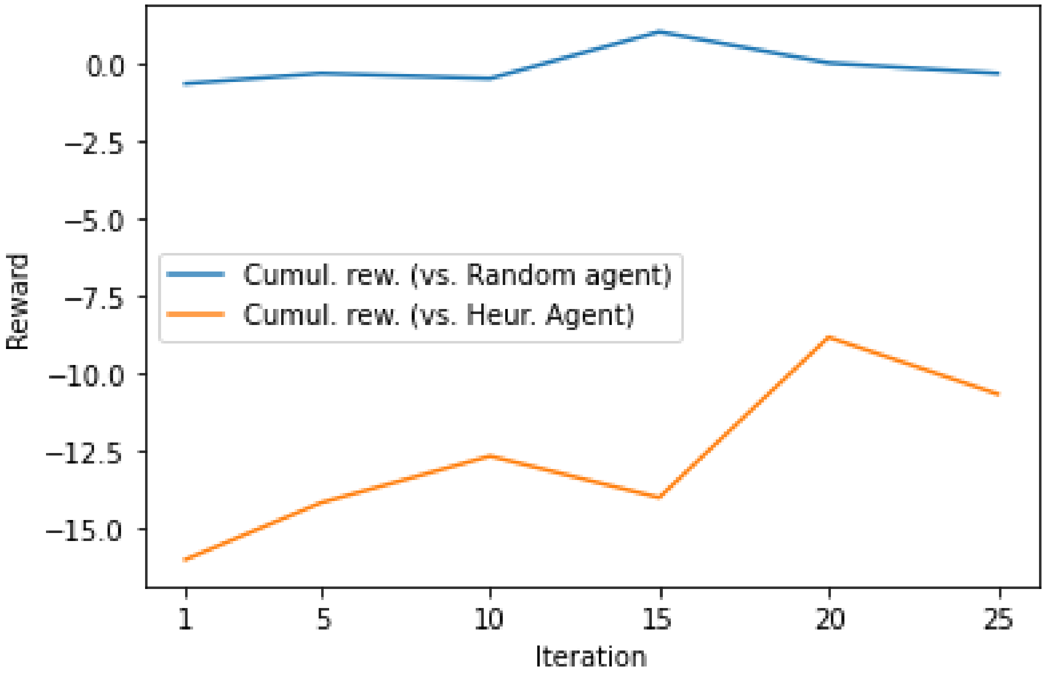
```
[ ]: hrstc_data = pd.read_csv(os.path.join(DATA_DIRECTORY,␣
      ↪f'{TIMESTAMP}_heuristic_player_game_stats.csv'))
     hrstc_data['timestamp'] = pd.to_datetime(perf_data['timestamp'])
     hrstc_data.set_index('iteration')
     hrstc_data.head()
```

```
[ ]:    iteration                     timestamp  wins  losses  draws  \
     0          1 1970-01-01 00:00:01.643392298   0.0    16.0    0.0
     1          5 1970-01-01 00:00:01.643393232   0.0    16.0    0.0
     2         10 1970-01-01 00:00:01.643394449   0.0    16.0    0.0
     3         15 1970-01-01 00:00:01.643395996   0.0    16.0    0.0
     4         20 1970-01-01 00:00:01.643398922   0.0    14.0    2.0

        nnet_cumul_rewards  random_cumul_rewards
     0          -16.000000             16.000000
     1          -14.166667             14.166667
     2          -12.666667             12.666667
     3          -14.000000             14.000000
     4           -8.833333              8.833333
```

```
[ ]: rndm_n_games = int(rndm_data['wins'][0] + rndm_data['losses'][0] +␣
      ↪rndm_data['draws'][0])
     hrstc_n_games = int(rndm_data['wins'][0] + rndm_data['losses'][0] +␣
      ↪rndm_data['draws'][0])

     rndm_fraction_won = rndm_data.apply(lambda row: row['wins'] / rndm_n_games,␣
      ↪axis=1).to_list()
     hrstc_fraction_won = hrstc_data.apply(lambda row: row['wins'] / hrstc_n_games,␣
      ↪axis=1).to_list()

     plt.plot(rndm_data['iteration'], rndm_fraction_won,  label=f'Random agent␣
      ↪(n={rndm_n_games})')
     plt.plot(rndm_data['iteration'], hrstc_fraction_won,  label=f'Heuristic agent␣
      ↪(n={hrstc_n_games})')
     plt.xticks(rndm_data['iteration'])
     plt.xlabel('Iteration')
     plt.ylabel(f'Fraction won')
     plt.legend()
     plt.show()
```



```
[ ]: plt.plot(rndm_data['iteration'], rndm_data['nnet_cumul_rewards'], ␣
      ↪label=f'Cumul. rew. (vs. Random agent)')
     plt.plot(rndm_data['iteration'], hrstc_data['nnet_cumul_rewards'], ␣
      ↪label=f'Cumul. rew. (vs. Heur. Agent)')
     plt.xticks(rndm_data['iteration'])
     plt.xlabel('Iteration')
     plt.ylabel(f'Reward')
     plt.legend()
     plt.show()
```


0.0
−2.5
−5.0
−7.5
−10.0
−12.5
−15.0
Reward
1
5
10
15
20
25
Iteration
Cumul. rew. (vs. Random agent)
Cumul. rew. (vs. Heur. Agent)