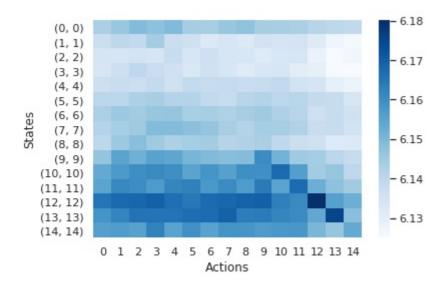
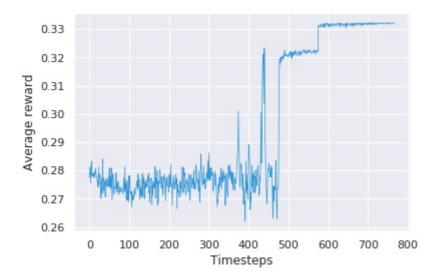
```
Out[66]:
                                                    1840 1841 1842 1843
                   1
                              2
                                        3
                                               . . .
     0.279303 0.281644 0.279118 0.277990
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
0
                                              . . .
     0.277499 0.275546 0.274464 0.277357
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
1
                                               . . .
     0.278139 0.277292 0.283209
                                    0.281009
                                                           NaN
                                                                 NaN
                                                                        NaN
                                                     NaN
                                               . . .
     0.282112 0.279055 0.278079 0.280397
                                                           NaN
                                                                 NaN
                                                                        NaN
3
                                                     NaN
                                               . . .
     0.280623 0.277431 0.283111
                                    0.282117
                                                           NaN
                                                                 NaN
                                                                        NaN
4
                                                     NaN
                                               . . .
                                               . . .
                                                     . . .
                                                           . . .
                                                                 . . .
                                                                        . . .
295
     0.280947
              0.277148
                         0.278684
                                    0.277602
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
                                               . . .
     0.280107
              0.283195
                         0.280672
                                                           NaN
                                                                 NaN
                                                                        NaN
296
                                    0.277256
                                                     NaN
                                               . . .
     0.280817 0.280277
                         0.277665
                                                           NaN
                                                                 NaN
                                                                        NaN
297
                                    0.282029
                                                     NaN
                                               . . .
     0.278062 0.279478 0.279437
                                                                 NaN
                                                                        NaN
298
                                    0.279340
                                                     NaN
                                                           NaN
                                               . . .
299
     0.282934 0.285722 0.284294 0.279728
                                                           NaN
                                                                 NaN
                                                     NaN
                                                                        NaN
                                              . . .
[300 rows x 1844 columns]
In [67]: avg rew 0 df = pd.DataFrame(avg rew 0)
In [68]: avg rew 0 df
Out [68]:
                                                    1840
                                                          1841
                                                                1842
                                                                       1843
                   1
                              2
                                        3
     0.279303 0.281644 0.279118 0.277990
0
                                                           NaN
                                                                 NaN
                                                                        NaN
                                                     NaN
                                               . . .
     0.277499 0.275546 0.274464 0.277357
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
1
                                               . . .
     0.278139 0.277292 0.283209
2
                                   0.281009
                                                           NaN
                                                                 NaN
                                                                        NaN
                                                     NaN
                                               . . .
     0.282112 0.279055 0.278079 0.280397
3
                                                           NaN
                                                                 NaN
                                                                        NaN
                                                     NaN
                                               . . .
     0.280623 0.277431 0.283111
                                                                 NaN
4
                                    0.282117
                                               . . .
                                                     NaN
                                                           NaN
                                                                        NaN
                               . . .
                                               . . .
                                                     . . .
                                                           . . .
                                                                 . . .
                                                                        . . .
              0.277148
295
     0.280947
                        0.278684
                                    0.277602
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
                                               . . .
296
     0.280107
              0.283195 0.280672
                                    0.277256
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
                                               . . .
297
     0.280817 0.280277 0.277665
                                    0.282029
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
                                               . . .
     0.278062 0.279478 0.279437
                                                                        NaN
298
                                    0.279340
                                                     NaN
                                                           NaN
                                                                 NaN
                                               . . .
     0.282934 0.285722 0.284294 0.279728
                                                           NaN
299
                                                     NaN
                                                                 NaN
                                                                        NaN
[300 rows x 1844 columns]
In [69]: avg rew 0 df.dropna(axis=1)
Out [69]:
                                               707
                                                         708
                                                                    709
                                    . . .
     0.279303 0.281644 0.279118
                                         0.323757
                                                    0.323465
                                                              0.323872
0
                                    . . .
     0.277499 0.275546 0.274464
                                         0.328651 0.328350
1
                                                              0.327730
                                    . . .
     0.278139 0.277292 0.283209
                                         0.319953 0.320075
2
                                                              0.319560
                                    . . .
     0.282112 0.279055 0.278079
                                         0.327804 0.327856
3
                                                              0.327905
                                    . . .
     0.280623 0.277431 0.283111
                                         0.324429 0.324322
4
                                                              0.324132
                                    . . .
                                    . . .
     0.280947
               0.277148
                         0.278684
                                         0.319455
                                                    0.319850
                                                              0.320096
295
                                    . . .
296
     0.280107
              0.283195
                         0.280672
                                         0.332006
                                                   0.332125
                                                              0.332332
                                    . . .
297
     0.280817
              0.280277 0.277665
                                         0.319468 0.319405
                                                              0.319124
                                    . . .
              0.279478 0.279437
298
     0.278062
                                         0.335819
                                                    0.335612
                                                              0.335793
                                    . . .
     0.282934 0.285722 0.284294
                                         0.335501 0.335515 0.335639
299
                                    . . .
[300 rows x 710 columns]
In [70]: avg rew 0 df
Out[70]:
                                                    1840
                                                          1841
                                                                1842
                                                                       1843
                   1
                              2
                                        3
                                               . . .
     0.279303 0.281644 0.279118 0.277990
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
0
                                               . . .
     0.277499 0.275546
                         0.274464
                                    0.277357
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
1
                                               . . .
              0.277292
                         0.283209
                                                                        NaN
2
     0.278139
                                    0.281009
                                                     NaN
                                                           NaN
                                                                 NaN
                                               . . .
               0.279055
                                                                        NaN
3
     0.282112
                         0.278079
                                    0.280397
                                                     NaN
                                                           NaN
                                                                 NaN
                                               . . .
              0.277431 0.283111
     0.280623
                                    0.282117
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
                                               . . .
                                                     . . .
                                                                        . . .
                               . . .
                                                           . . .
                                                                 . . .
                                               . . .
     0.280947
               0.277148
                          0.278684
                                    0.277602
295
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
                                               . . .
     0.280107 0.283195 0.280672
                                    0.277256
                                                     NaN
                                                           NaN
                                                                 NaN
                                                                        NaN
```

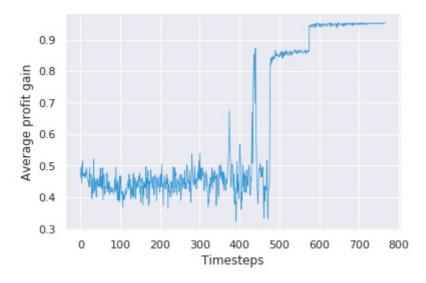
```
297
     0.280817 0.280277 0.277665
                                     0.282029
                                                      NaN
                                                             NaN
                                                                   NaN
                                                                          NaN
298
     0.278062 0.279478 0.279437
                                                      NaN
                                                             NaN
                                                                   NaN
                                                                          NaN
                                     0.279340
                                                . . .
299
     0.282934  0.285722  0.284294  0.279728  ...
                                                      NaN
                                                             NaN
                                                                   NaN
                                                                          NaN
[300 rows x 1844 columns]
In [71]: avg rew 0 dropNaN df = avg rew 0 df.dropna(axis=1)
    ...: avg rew 1 dropNaN df = avg rew 1 df.dropna(axis=1)
In [72]: avg_rew_1_dropNaN_df
Out[72]:
          0
                                                707
                                                           708
                                                                      709
                                     . . .
0
     0.279303 0.281644
                                          0.323757
                                                     0.323465
                                                                0.323872
                         0.279118
                                     . . .
                                                                0.327730
1
     0.277499
               0.275546
                          0.274464
                                          0.328651
                                                     0.328350
                                     . . .
2
                                                                0.319560
               0.277292
                          0.283209
                                           0.319953
                                                     0.320075
     0.278139
                                     . . .
3
     0.282112
               0.279055
                          0.278079
                                           0.327804
                                                     0.327856
                                                                0.327905
                                     . . .
     0.280623
               0.277431
                          0.283111
                                          0.324429
                                                     0.324322
                                                                0.324132
4
                                     . . .
                                     . . .
     0.280947
                0.277148
                          0.278684
                                                                0.320096
295
                                           0.319455
                                                     0.319850
                                     . . .
                                                     0.332125
                                                                0.332332
296
     0.280107
               0.283195
                          0.280672
                                           0.332006
                                     . . .
                                                                0.319124
297
     0.280817
               0.280277
                          0.277665
                                           0.319468
                                                     0.319405
                                     . . .
298
     0.278062
               0.279478
                          0.279437
                                           0.335819
                                                     0.335612
                                                                0.335793
                                     . . .
299
     0.282934
               0.285722 0.284294
                                          0.335501 0.335515
                                                                0.335639
[300 rows x 710 columns]
In [73]: index = []
    ...: for i in range(15):
              for j in range(15):
                  if i==j:
    . . . :
                      index.append(s dict[(i,j)])
    ...:
    ...: labels = []
    ...: for i in index:
              labels.append(list(s dict.keys())[i])
    ...:
    ...:
    ...: sns.heatmap(final avg q[index,], yticklabels=labels, cmap="Blues")
    ...: plt.savefig('fig1.png', dpi=600)
    ...: plt.show()
                                                      6.18
   (0, 0)
   (1, 1)
   (2, 2)
                                                     - 6.17
   (3, 3)
   (4, 4)
                                                      6.16
   (5, 5)
   (6, 6)
   (7, 7)
                                                     - 6.15
   (8, 8)
   (9, 9)
 (10, 10)
                                                     - 6.14
 (11, 11)
 (12, 12)
 (13, 13)
                                                     -6.13
 (14, 14)
          0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
In [74]: sns.heatmap(final avg q[index,], yticklabels=labels, cmap="Blues")
    ...: plt.xlabel('Actions')
    ...: plt.ylabel('States')
    ...: plt.savefig('fig1.png', dpi=600)
```

```
...: plt.show()
```

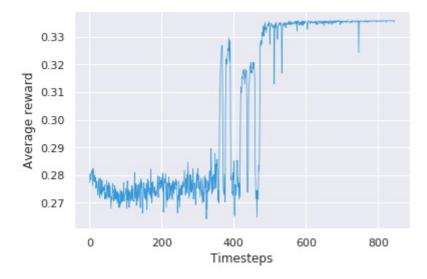


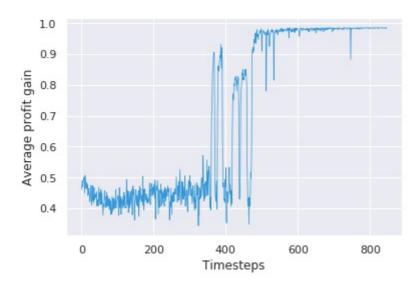
```
In [75]: i = np.random.randint(NUM EPISODES)
    ...: avg_delta_0 = (np.array(avg_rew_0[i]) - 0.22589)/(0.337472 - 0.22589)
    ...: avg_delta_1 = (np.array(avg_rew_1[i]) - 0.22589)/(0.337472 - 0.22589)
    ...:
    ...: print(f"Showing training progress for Episode {i} of {NUM EPISODES}")
    ...: plt.plot(avg_rew_0[i], label='agent_0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average reward')
    ...: plt.savefig('fig2.png', dpi=600)
    ...: plt.show()
    ...: plt.plot(avg delta 0, label='agent 0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average profit gain')
    ...: plt.savefig('fig3.png', dpi=600)
    ...: plt.show()
Showing training progress for Episode 274 of 300
```



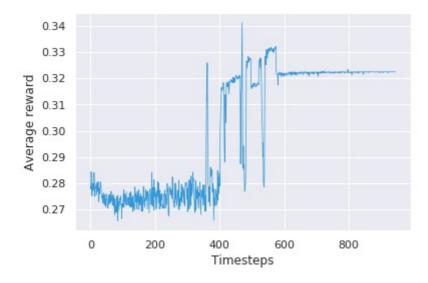


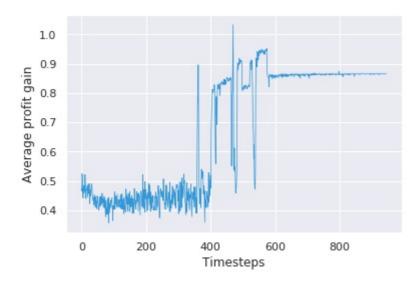
```
In [76]: i = np.random.randint(NUM EPISODES)
    ...: avg_delta_0 = (np.array(avg_rew_0[i]) - 0.22589)/(0.337472 - 0.22589)
    ...: avg_delta_1 = (np.array(avg_rew_1[i]) - 0.22589)/(0.337472 - 0.22589)
    ...:
    ...: print(f"Showing training progress for Episode {i} of {NUM_EPISODES}")
    ...: plt.plot(avg_rew_0[i], label='agent_0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average reward')
    ...: plt.savefig(f'fig2-{i}.png', dpi=600)
    ...: plt.show()
    ...:
    ...: plt.plot(avg_delta_0, label='agent_0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average profit gain')
    ...: plt.savefig(f'fig3-{i}.png', dpi=600)
    ...: plt.show()
Showing training progress for Episode 78 of 300
```



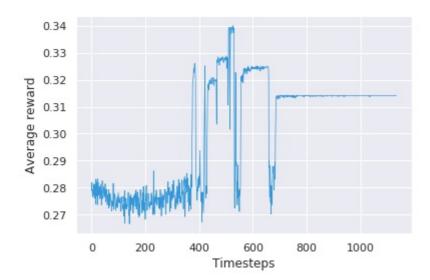


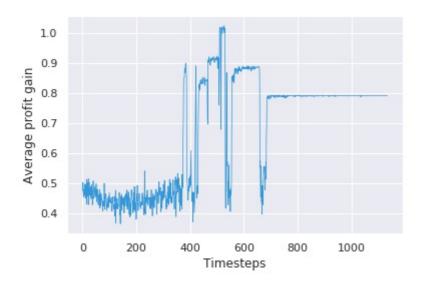
```
In [77]: i = np.random.randint(NUM EPISODES)
    ...: avg_delta_0 = (np.array(avg_rew_0[i]) - 0.22589)/(0.337472 - 0.22589)
    ...: avg_delta_1 = (np.array(avg_rew_1[i]) - 0.22589)/(0.337472 - 0.22589)
    ...:
    ...: print(f"Showing training progress for Episode {i} of {NUM_EPISODES}")
    ...: plt.plot(avg_rew_0[i], label='agent_0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average reward')
    ...: plt.savefig(f'fig2-{i}.png', dpi=600)
    ...: plt.show()
    ...:
    ...: plt.plot(avg_delta_0, label='agent_0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average profit gain')
    ...: plt.savefig(f'fig3-{i}.png', dpi=600)
    ...: plt.show()
Showing training progress for Episode 33 of 300
```



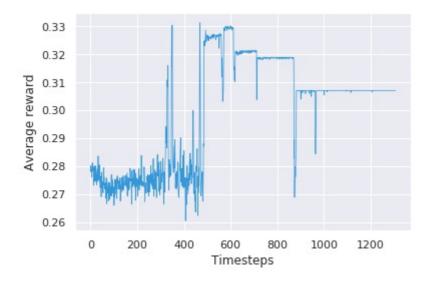


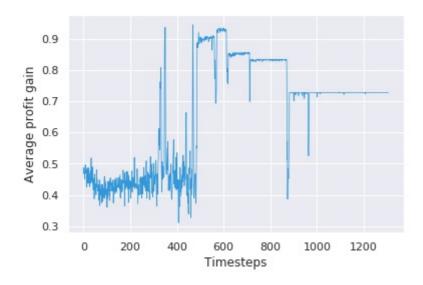
```
In [78]: i = np.random.randint(NUM EPISODES)
    ...: avg_delta_0 = (np.array(avg_rew_0[i]) - 0.22589)/(0.337472 - 0.22589)
    ...: avg_delta_1 = (np.array(avg_rew_1[i]) - 0.22589)/(0.337472 - 0.22589)
    ...:
    ...: print(f"Showing training progress for Episode {i} of {NUM_EPISODES}")
    ...: plt.plot(avg_rew_0[i], label='agent_0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average reward')
    ...: plt.savefig(f'fig2-{i}.png', dpi=600)
    ...: plt.show()
    ...:
    ...: plt.plot(avg_delta_0, label='agent_0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average profit gain')
    ...: plt.savefig(f'fig3-{i}.png', dpi=600)
    ...: plt.show()
Showing training progress for Episode 82 of 300
```



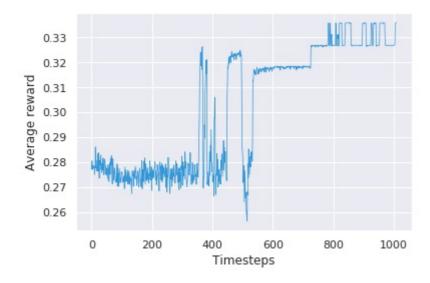


```
In [79]: i = np.random.randint(NUM EPISODES)
    ...: avg_delta_0 = (np.array(avg_rew_0[i]) - 0.22589)/(0.337472 - 0.22589)
    ...: avg_delta_1 = (np.array(avg_rew_1[i]) - 0.22589)/(0.337472 - 0.22589)
    ...:
    ...: print(f"Showing training progress for Episode {i} of {NUM_EPISODES}")
    ...: plt.plot(avg_rew_0[i], label='agent_0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average reward')
    ...: plt.savefig(f'fig2-{i}.png', dpi=600)
    ...: plt.show()
    ...:
    ...: plt.plot(avg_delta_0, label='agent_0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average profit gain')
    ...: plt.savefig(f'fig3-{i}.png', dpi=600)
    ...: plt.show()
Showing training progress for Episode 195 of 300
```





```
In [80]: i = np.random.randint(NUM EPISODES)
    ...: avg_delta_0 = (np.array(avg_rew_0[i]) - 0.22589)/(0.337472 - 0.22589)
    ...: avg_delta_1 = (np.array(avg_rew_1[i]) - 0.22589)/(0.337472 - 0.22589)
    ...:
    ...: print(f"Showing training progress for Episode {i} of {NUM_EPISODES}")
    ...: plt.plot(avg_rew_0[i], label='agent_0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average reward')
    ...: plt.savefig(f'fig2-{i}.png', dpi=600)
    ...: plt.show()
    . . . :
    ...: plt.plot(avg_delta_0, label='agent_0', c="#3498db", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average profit gain')
    ...: plt.savefig(f'fig3-{i}.png', dpi=600)
    ...: plt.show()
Showing training progress for Episode 28 of 300
```



```
1.0
0.9
UE 0.8
0.7
0.6
0.5
0.4
0.3
0 200 400 600 800 1000
Timesteps
```

```
In [81]: steps_at_conv_df
Out[81]:
     steps_at_conv
0
            1240266
1
            865005
2
             793681
3
             992148
4
             953446
295
             814383
296
            811064
297
            1051875
298
            816400
299
            916347
[300 rows x 1 columns]
In [82]: steps_at_conv_df.mean
Out[82]:
<bound method DataFrame.mean of</pre>
                                       steps at conv
            1240266
1
            865005
2
             793681
3
             992148
4
             953446
295
             814383
            811064
296
297
            1051875
298
            816400
299
            916347
[300 rows x 1 columns]>
In [83]: steps_at_conv_df.mean()
Out[83]:
                  1.050035e+06
steps_at_conv
dtype: float64
In [84]: steps_at_conv_df.describe()
Out[84]:
       steps_at_conv
        3.000000e+02
count
        1.050035e+06
mean
```

```
2.072801e+05
std
min
        7.108360e+05
25%
        8.842405e+05
50%
        1.056762e+06
75%
        1.173472e+06
        1.844669e+06
max
In [85]: sns.boxplot(steps at conv df)
Out[85]: <matplotlib.axes. subplots.AxesSubplot at 0x7f4eec777358>
   800000 1000000 1200000 1400000 1600000 1800000
In [86]: sns.boxplot(steps at conv df, c="#3498db")
Traceback (most recent call last):
  File "<ipython-input-86-aa04602aa7c1>", line 1, in <module>
    sns.boxplot(steps at conv df, c="#3498db")
  File "/home/lorenzo/anaconda3/envs/tf-rllib-2/lib/python3.6/site-packages/seaborn/
categorical.py", line 2237, in boxplot
    plotter.plot(ax, kwargs)
  File "/home/lorenzo/anaconda3/envs/tf-rllib-2/lib/python3.6/site-packages/seaborn/
categorical.py", line 549, in plot
    self.draw boxplot(ax, boxplot kws)
  File "/home/lorenzo/anaconda3/envs/tf-rllib-2/lib/python3.6/site-packages/seaborn/
categorical.py", line 486, in draw boxplot
    **kws)
 File "/home/lorenzo/anaconda3/envs/tf-rllib-2/lib/python3.6/site-packages/
matplotlib/cbook/deprecation.py", line 307, in wrapper
    return func(*args, **kwargs)
```

TypeError: boxplot() got an unexpected keyword argument 'c'

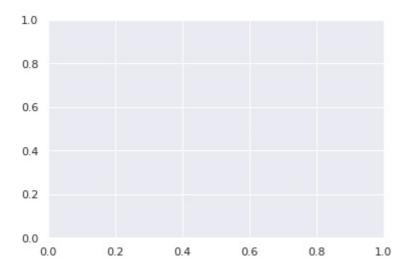
return func(ax, *map(sanitize sequence, args), **kwargs)

matplotlib/__init__.py", line 1589, in inner

File "/home/lorenzo/anaconda3/envs/tf-rllib-2/lib/python3.6/site-packages/

```
1.0
 0.8
 0.6
 0.4
 0.2
 0.0
   0.0
             0.2
                      0.4
                                0.6
                                         0.8
                                                   1.0
In [87]:
In [87]: steps at conv df.describe()
    ...: sns.boxplot(steps at conv df, cmap="#3498db")
Traceback (most recent call last):
 File "<ipython-input-87-575c51862508>", line 2, in <module>
    sns.boxplot(steps at conv df, cmap="#3498db")
  File "/home/lorenzo/anaconda3/envs/tf-rllib-2/lib/python3.6/site-packages/seaborn/
categorical.py", line 2237, in boxplot
    plotter.plot(ax, kwargs)
  File "/home/lorenzo/anaconda3/envs/tf-rllib-2/lib/python3.6/site-packages/seaborn/
categorical.py", line 549, in plot
    self.draw boxplot(ax, boxplot kws)
  File "/home/lorenzo/anaconda3/envs/tf-rllib-2/lib/python3.6/site-packages/seaborn/
categorical.py", line 486, in draw boxplot
    **kws)
 File "/home/lorenzo/anaconda3/envs/tf-rllib-2/lib/python3.6/site-packages/
matplotlib/cbook/deprecation.py", line 307, in wrapper
    return func(*args, **kwargs)
  File "/home/lorenzo/anaconda3/envs/tf-rllib-2/lib/python3.6/site-packages/
matplotlib/__init__.py", line 1589, in inner
    return func(ax, *map(sanitize sequence, args), **kwargs)
```

TypeError: boxplot() got an unexpected keyword argument 'cmap'

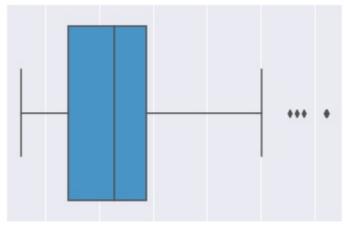


In [88]:

In [88]: steps at conv df.describe()

...: sns.boxplot(steps_at_conv_df, color="#3498db")

Out[88]: <matplotlib.axes._subplots.AxesSubplot at 0x7f4eec575358>



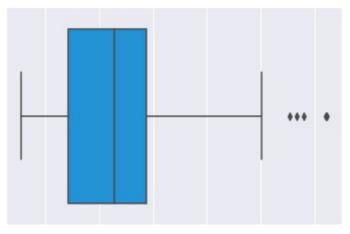
800000 1000000 1200000 1400000 1600000 1800000

```
In [89]: sns.boxplot(steps_at_conv_df, color="#069af3"
File "<ipython-input-89-df92309f58ae>", line 1
    sns.boxplot(steps_at_conv_df, color="#069af3"
```

SyntaxError: unexpected EOF while parsing

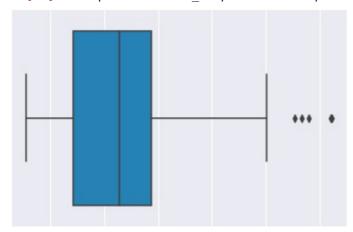
In [90]:

```
In [90]: sns.boxplot(steps_at_conv_df, color="#069af3")
Out[90]: <matplotlib.axes._subplots.AxesSubplot at 0x7f4eec4e4cc0>
```



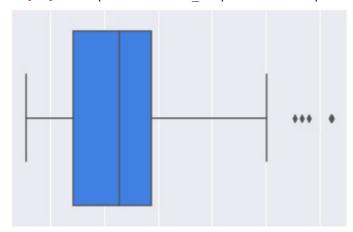
800000 1000000 1200000 1400000 1600000 1800000

In [91]: sns.boxplot(steps_at_conv_df, color="#0e87cc")
Out[91]: <matplotlib.axes. subplots.AxesSubplot at 0x7f4eec84fb70>



800000 1000000 1200000 1400000 1600000 1800000

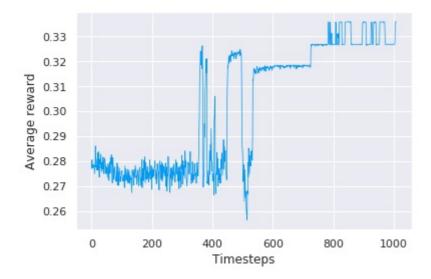
In [92]: sns.boxplot(steps_at_conv_df, color="#247afd")
Out[92]: <matplotlib.axes. subplots.AxesSubplot at 0x7f4eec424a20>

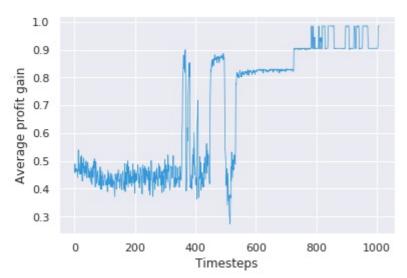


800000 1000000 1200000 1400000 1600000 1800000

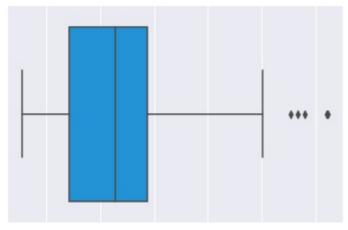
```
In [93]: print(f"Showing training progress for Episode {i} of {NUM_EPISODES}")
    ...: plt.plot(avg_rew_0[i], label='agent_0', c="#069af3", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average reward')
    ...: plt.savefig(f'fig2-{i}.png', dpi=600)
```

```
...: plt.show()
...:
...: plt.plot(avg_delta_0, label='agent_0', c="#3498db", lw=0.7)
...: plt.xlabel('Timesteps')
...: plt.ylabel('Average profit gain')
...: plt.savefig(f'fig3-{i}.png', dpi=600)
...: plt.show()
Showing training progress for Episode 28 of 300
```



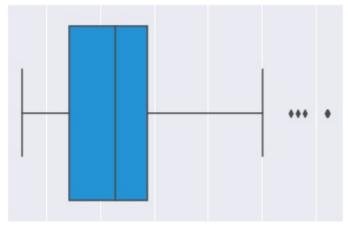


In [94]: steps_at_conv_df.describe()
 ...: sns.boxplot(steps_at_conv_df, color="#069af3")
Out[94]: <matplotlib.axes. subplots.AxesSubplot at 0x7f4eec34ef28>



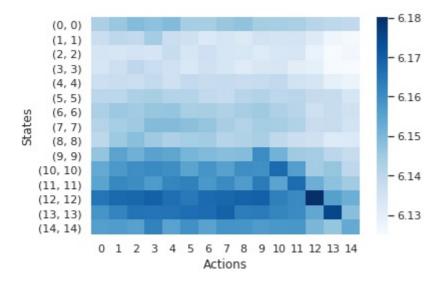
800000 1000000 1200000 1400000 1600000 1800000

```
In [95]: steps_at_conv_df.describe()
    ...: sns.boxplot(steps_at_conv_df, color="#069af3")
    ...: plt.xlabel('Timesteps')
    ...: plt.savefig('ts_boxplot.png', dpi=600)
    ...: plt.show()
```

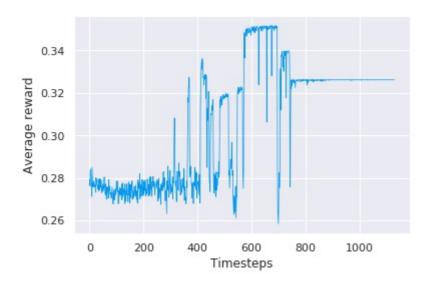


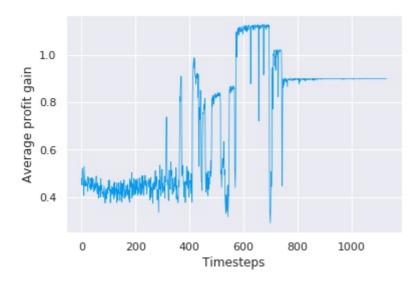
800000 1000000 1200000 1400000 1600000 1800000 Timesteps

```
In [96]: index = []
    ...: for i in range(15):
    ...: for j in range(15):
                if i==j:
   ...:
                     index.append(s_dict[(i,j)])
   ...:
   ...:
    ...: labels = []
    ...: for i in index:
             labels.append(list(s_dict.keys())[i])
    ...:
    ...:
    ...: sns.heatmap(final_avg_q[index,], yticklabels=labels, cmap="Blues")
    ...: plt.xlabel('Actions')
    ...: plt.ylabel('States')
    ...: plt.savefig('fig1.png', dpi=600)
    ...: plt.show()
```

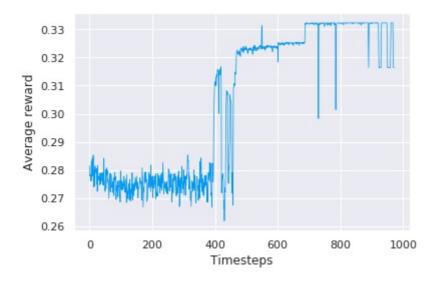


```
In [97]: i = np.random.randint(NUM EPISODES)
    ...: avg_delta_0 = (np.array(avg_rew_0[i]) - 0.22589)/(0.337472 - 0.22589)
    ...: avg_delta_1 = (np.array(avg_rew_1[i]) - 0.22589)/(0.337472 - 0.22589)
    ...:
    ...: print(f"Showing training progress for Episode {i} of {NUM EPISODES}")
    ...: plt.plot(avg_rew_0[i], label='agent_0', c="#069af3", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average reward')
    ...: plt.savefig(f'fig2-{i}.png', dpi=600)
    ...: plt.show()
    ...: plt.plot(avg delta 0, label='agent 0', c="#069af3", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average profit gain')
    ...: plt.savefig(f'fig3-{i}.png', dpi=600)
    ...: plt.show()
Showing training progress for Episode 146 of 300
```





```
In [98]: i = np.random.randint(NUM EPISODES)
    ...: avg_delta_0 = (np.array(avg_rew_0[i]) - 0.22589)/(0.337472 - 0.22589)
    ...: avg_delta_1 = (np.array(avg_rew_1[i]) - 0.22589)/(0.337472 - 0.22589)
    ...:
    ...: print(f"Showing training progress for Episode {i} of {NUM_EPISODES}")
    ...: plt.plot(avg_rew_0[i], label='agent_0', c="#069af3", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average reward')
    ...: plt.savefig(f'fig2-{i}.png', dpi=600)
    ...: plt.show()
    ...:
    ...: plt.plot(avg_delta_0, label='agent_0', c="#069af3", lw=0.7)
    ...: plt.xlabel('Timesteps')
    ...: plt.ylabel('Average profit gain')
    ...: plt.savefig(f'fig3-{i}.png', dpi=600)
    ...: plt.show()
Showing training progress for Episode 20 of 300
```



```
0.9 Use a broad of the first of
```

SyntaxError: unexpected EOF while parsing

```
In [100]:
```

```
In [100]: steps_at_conv_df.describe()
Out[100]:
       steps_at_conv
count
        3.000000e+02
mean
        1.050035e+06
std
        2.072801e+05
min
        7.108360e+05
25%
        8.842405e+05
50%
        1.056762e+06
75%
        1.173472e+06
max
        1.844669e+06
```

In [101]: