experiments

August 22, 2023

```
[1]: import matplotlib.pyplot as plt
     import seaborn as sns
     import numpy as np
     import pandas as pd
     from stable_baselines3 import A2C, DDPG, PPO, SAC
     from finrl.agents.stablebaselines3.models import DRLAgent
     from finrl.config import INDICATORS, TRAINED_MODEL_DIR
     from finrl.meta.env_stock_trading.env_stocktrading import StockTradingEnv
     from finrl.meta.preprocessor.yahoodownloader import YahooDownloader

     %matplotlib inline
```

```
2023-08-22 19:55:25.834934: I tensorflow/core/platform/cpu_feature_guard.cc:182]
This TensorFlow binary is optimized to use available CPU instructions in
performance-critical operations.
To enable the following instructions: AVX2 FMA, in other operations, rebuild
TensorFlow with the appropriate compiler flags.
2023-08-22 19:55:27.426288: W
tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not
find TensorRT
```

1 Part 2. Backtesting

```
[2]: train = pd.read_csv('train_data.csv')
     trade = pd.read_csv('trade_data.csv')
     train = train.set_index(train.columns[0])
     train.index.names = ['']
     trade = trade.set_index(trade.columns[0])
     trade.index.names = ['']
```

```
[3]: if_using_a2c = True
     if_using_ddpg = True
     if_using_ppo = True
     if_using_sac = True
```

```
[4]: trained_a2c = A2C.load(TRAINED_MODEL_DIR + "/agent_a2c") if if_using_a2c else
     ↪None
```

```
trained_ddpg = DDPG.load(TRAINED_MODEL_DIR + "/agent_ddpg") if if_using_ddpg
↪else None
trained_ppo = PPO.load(TRAINED_MODEL_DIR + "/agent_ppo") if if_using_ppo else
↪None
trained_sac = SAC.load(TRAINED_MODEL_DIR + "/agent_sac") if if_using_sac else
↪None
```

```
[5]: stock_dimension = len(trade.tic.unique())
     state_space = 1 + 2 * stock_dimension + len(INDICATORS) * stock_dimension
     print(f"Stock Dimension: {stock_dimension}, State Space: {state_space}")
```

Stock Dimension: 29, State Space: 291

```
[6]: buy_cost_list = sell_cost_list = [0.001] * stock_dimension
     num_stock_shares = [0] * stock_dimension

     env_kwargs = {
         "hmax": 100,
         "initial_amount": 1000000,
         "num_stock_shares": num_stock_shares,
         "buy_cost_pct": buy_cost_list,
         "sell_cost_pct": sell_cost_list,
         "state_space": state_space,
         "stock_dim": stock_dimension,
         "tech_indicator_list": INDICATORS,
         "action_space": stock_dimension,
         "reward_scaling": 1e-4
     }
```

```
[7]: trade
```

```
[7]:         date    tic        open        high         low       close  \
     0    2020-07-01   AAPL   91.279999   91.839996   90.977501   89.250435
     0    2020-07-01   AMGN  235.520004  256.230011  232.580002  230.553375
     0    2020-07-01    AXP   95.250000   96.959999   93.639999   90.432198
     0    2020-07-01     BA  185.880005  190.610001  180.039993  180.320007
     0    2020-07-01    CAT  129.380005  129.399994  125.879997  117.235703
     ..          ...    ...         ...         ...         ...         ...
     334  2021-10-27    UNH  454.640015  460.440002  453.480011  442.888275
     334  2021-10-27      V  224.750000  224.750000  215.660004  212.550888
     334  2021-10-27     VZ   53.169998   53.200001   52.470001   47.476547
     334  2021-10-27    WBA   48.450001   48.459999   47.090000   42.596809
     334  2021-10-27    WMT  148.960007  149.020004  147.389999  143.020203

             volume  day        macd      boll_ub     boll_lb      rsi_30  \
```

```
0     110737200.0   2.0     2.992670    92.024810    79.596532   62.807161
0       6575800.0   2.0     3.491020   223.106913   192.209086   61.279638
0       3301000.0   2.0    -0.382171   108.440349    86.182875   48.504820
0      49036700.0   2.0     5.443193   220.721139   160.932863   50.925771
0       2807800.0   2.0     1.236598   126.925995   110.143821   52.865424
..            ...   ...          ...          ...          ...         ...
334     3520400.0   2.0    11.389334   453.317599   363.583100   65.085948
334    22958100.0   2.0     0.013828   233.490236   215.279985   41.737207
334    15007400.0   2.0    -0.220521    49.223191    46.156535   44.604910
334     5652000.0   2.0    -0.014852    45.261754    41.446075   46.167780
334     4855200.0   2.0     1.514193   146.313353   128.700708   57.061094

            cci_30        dx_30   close_30_sma  close_60_sma         vix   turbulence

0       107.503400   29.730532      83.323037     77.152043   28.620001    53.068015
0       270.449978   46.806139     206.269306    207.299417   28.620001    53.068015
0       -66.291609    3.142448      95.497790     89.066325   28.620001    53.068015
0        24.220608   15.932920     176.472335    155.614168   28.620001    53.068015
0        35.746627   14.457404     116.031969    110.429062   28.620001    53.068015
..             ...         ...           ...           ...         ...          ...
334     174.334935   51.571330     405.454169    405.739810   16.980000   145.285221
334    -153.711177   30.337021     223.493653    225.707213   16.980000   145.285221
334     -50.018824    8.504850      47.925124     48.541796   16.980000   145.285221
334     -62.274121    5.045608      43.558371     43.880977   16.980000   145.285221
334     124.802270   30.006323     137.794953    140.471093   16.980000   145.285221

[9715 rows x 18 columns]
```

[8]: `INDICATORS`

[8]:
```
['macd',
 'boll_ub',
 'boll_lb',
 'rsi_30',
 'cci_30',
 'dx_30',
 'close_30_sma',
 'close_60_sma']
```

[9]:
```python
e_trade_gym = StockTradingEnv(df = trade, turbulence_threshold = 70,
    risk_indicator_col='vix', **env_kwargs)
# env_trade, obs_trade = e_trade_gym.get_sb_env()
```

[10]: `e_trade_gym.action_space`

[10]: `Box(-1.0, 1.0, (29,), float32)`

```
[11]: df_account_value_a2c, df_actions_a2c = DRLAgent.DRL_prediction(
          model=trained_a2c,
          environment = e_trade_gym) if if_using_a2c else (None, None)
```

hit end!

```
[12]: df_account_value_ddpg, df_actions_ddpg = DRLAgent.DRL_prediction(
          model=trained_ddpg,
          environment = e_trade_gym) if if_using_ddpg else (None, None)
```

hit end!

```
[13]: df_account_value_ppo, df_actions_ppo = DRLAgent.DRL_prediction(
          model=trained_ppo,
          environment = e_trade_gym) if if_using_ppo else (None, None)
```

hit end!

```
[14]: df_account_value_sac, df_actions_sac = DRLAgent.DRL_prediction(
          model=trained_sac,
          environment = e_trade_gym) if if_using_sac else (None, None)
```

hit end!

```
[15]: df_actions_a2c
```

[15]:

date	AAPL	AMGN	AXP	BA	CAT	CRM	CSCO	CVX	DIS	GS	…	MRK	MSFT	\
2020-07-01	54	50	0	20	0	0	0	70	0	0	…	100	0	
2020-07-02	54	50	0	20	0	0	0	70	0	0	…	100	0	
2020-07-06	54	50	0	20	0	0	0	70	0	0	…	100	0	
2020-07-07	54	50	0	20	0	0	0	70	0	0	…	100	0	
2020-07-08	54	50	0	20	0	0	0	70	0	0	…	100	0	
…	…	…	…	..	…	…	…	…	…	..	…	…	…	
2021-10-20	0	0	0	0	0	0	0	0	0	0	…	0	0	
2021-10-21	0	0	0	0	0	0	0	0	0	0	…	0	0	
2021-10-22	0	0	0	0	0	0	0	0	0	0	…	0	0	
2021-10-25	0	0	0	0	0	0	0	0	0	0	…	0	0	
2021-10-26	0	0	0	0	0	0	0	0	0	0	…	0	0	

date	NKE	PG	TRV	UNH	V	VZ	WBA	WMT
2020-07-01	0	0	100	0	100	51	100	0
2020-07-02	0	0	100	0	100	51	100	0
2020-07-06	0	0	100	0	100	51	100	0
2020-07-07	0	0	100	0	100	51	100	0
2020-07-08	0	0	100	0	100	51	100	0
…	…	..	…	…	…	..	…	…

```
2021-10-20    0    0    0    0    0    0    0    0
2021-10-21    0    0    0    0    0    0    0    0
2021-10-22    0    0    0    0    0    0    0    0
2021-10-25    0    0    0    0    0    0    0    0
2021-10-26    0    0    0    0    0    0    0    0

[334 rows x 29 columns]
```
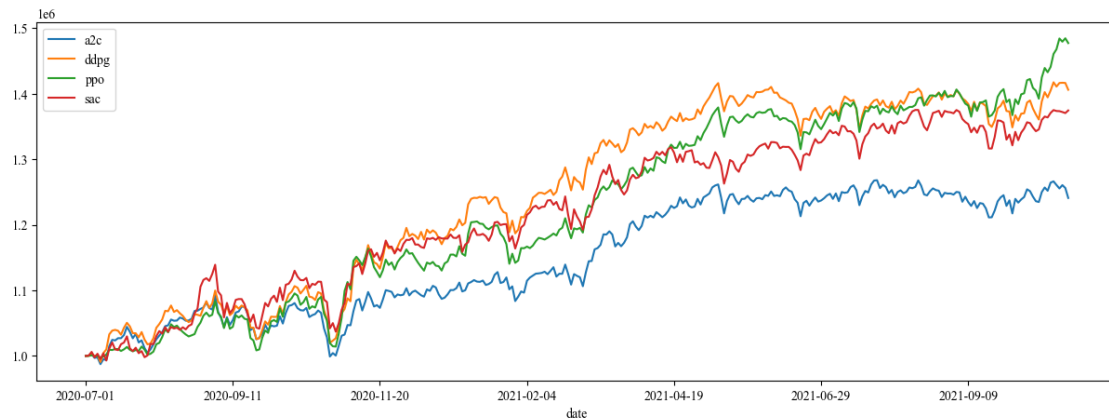
2 Part 5: Backtesting Results

```python
[16]: df_result_a2c = (
          df_account_value_a2c.set_index(df_account_value_a2c.columns[0])
          if if_using_a2c
          else None
      )
      df_result_ddpg = (
          df_account_value_ddpg.set_index(df_account_value_ddpg.columns[0])
          if if_using_ddpg
          else None
      )
      df_result_ppo = (
          df_account_value_ppo.set_index(df_account_value_ppo.columns[0])
          if if_using_ppo
          else None
      )
      df_result_sac = (
          df_account_value_sac.set_index(df_account_value_sac.columns[0])
          if if_using_sac
          else None
      )

      result = pd.DataFrame(
          {
              "a2c": df_result_a2c["account_value"] if if_using_a2c else None,
              "ddpg": df_result_ddpg["account_value"] if if_using_ddpg else None,
              "ppo": df_result_ppo["account_value"] if if_using_ppo else None,
              "sac": df_result_sac["account_value"] if if_using_sac else None,
          }
      )
```

```python
[17]: plt.rcParams["font.family"] = "Times New Roman"
      plt.rcParams["figure.figsize"] = (15,5)
      plt.figure()
      result.plot()
      plt.savefig('./results/models.png')
```

```
<Figure size 1500x500 with 0 Axes>
```



```
[18]: rewards_a2c = list()
      turbulence_a2c = list()
      cost_a2c = list()
      trade_a2c = list()

      obs = e_trade_gym.reset()[0]
      # print(obs[0])
      while True:
          action1, _states1 = trained_a2c.predict(obs)
          obs, rewards, done, info, new = e_trade_gym.step(np.array(action1))
          print('rewards', rewards)
          rewards_a2c.append(rewards)
          print('turbulence', e_trade_gym.turbulence)
          turbulence_a2c.append(e_trade_gym.turbulence)
          print('trade:', e_trade_gym.trades)
          trade_a2c.append(e_trade_gym.trades)
          print('cost:', e_trade_gym.cost)
          cost_a2c.append(e_trade_gym.cost)
          if done:
              print(done)
              print(info)
              print(new)
              break
      e_trade_gym.asset_memory[-1]
```

```
rewards 0.03113716656494653
turbulence 27.68000030517578
trade: 13
cost: 125.30327636718751
rewards 0.3662239290721715
turbulence 27.940000534057617
```

```
trade: 30
cost: 284.3914125556946
rewards -0.7393740833351156
turbulence 29.43000030517578
trade: 50
cost: 459.69716442489613
rewards 0.13567126853637165
turbulence 28.07999992370605
trade: 73
cost: 667.2160693321227
rewards -0.9583369950416615
turbulence 29.26000022888184
trade: 94
cost: 854.3416006507874
rewards 0.7354322282940033
turbulence 27.290000915527344
trade: 115
cost: 1020.8388405685427
rewards -0.2847512890625047
turbulence 32.189998626708984
trade: 139
cost: 1247.224179161072
rewards 2.221222654237738
turbulence 29.520000457763672
trade: 164
cost: 1459.8555469398498
rewards 0.9284907585678157
turbulence 27.76000022888184
trade: 189
cost: 1581.25422423172
rewards -0.05060127131805057
turbulence 28.0
trade: 211
cost: 1694.5695344581607
rewards 0.3234075091251289
turbulence 25.68000030517578
trade: 234
cost: 1808.2073567199714
rewards 0.1035025474510272
turbulence 24.459999084472656
trade: 256
cost: 1891.0315831375128
rewards 0.529817419263837
turbulence 24.84000015258789
trade: 276
cost: 1952.5837088584901
rewards 1.2034859807617149
turbulence 24.31999969482422
```

```
trade: 296
cost: 1990.5119986228945
rewards -0.8633593912391575
turbulence 26.07999992370605
trade: 314
cost: 2006.0662190895084
rewards -1.2880355567718507
turbulence 25.84000015258789
trade: 334
cost: 2031.052295230866
rewards 0.4408336715698242
turbulence 24.739999771118164
trade: 351
cost: 2031.052295230866
rewards -1.223238580357749
turbulence 25.440000534057617
trade: 370
cost: 2059.8711241683964
rewards 0.3011460548400879
turbulence 24.100000381469727
trade: 389
cost: 2059.8711241683964
rewards -1.0615018875946058
turbulence 24.76000022888184
trade: 408
cost: 2060.978405723572
rewards -0.7985239167816123
turbulence 24.459999084472656
trade: 425
cost: 2068.321157829285
rewards 0.41784470845679755
turbulence 24.280000686645508
trade: 443
cost: 2083.310604328156
rewards 0.810356547164917
turbulence 23.76000022888184
trade: 461
cost: 2083.310604328156
rewards 0.7950501281402657
turbulence 22.989999771118164
trade: 479
cost: 2090.363094898224
rewards 0.5065788068832364
turbulence 22.649999618530277
trade: 493
cost: 2110.4294686622625
rewards 0.5172988845825196
turbulence 22.209999084472656
```

```
trade: 510
cost: 2110.4294686622625
rewards 0.859037114533235
turbulence 22.1299991607666
trade: 525
cost: 2114.8952450218203
rewards 0.041691780853271486
turbulence 24.030000686645508
trade: 544
cost: 2114.8952450218203
rewards 0.9321375656043994
turbulence 22.280000686645508
trade: 560
cost: 2118.56408360672
rewards -0.29571430664062504
turbulence 22.1299991607666
trade: 580
cost: 2118.56408360672
rewards 0.006441932354739402
turbulence 22.049999237060547
trade: 597
cost: 2121.0274428596495
rewards 0.48092956085203914
turbulence 21.350000381469727
trade: 615
cost: 2121.0274428596495
rewards -0.12813202172163873
turbulence 21.51000022888184
trade: 634
cost: 2128.079738628387
rewards -0.3210515495300293
turbulence 22.540000915527344
trade: 650
cost: 2128.079738628387
rewards 0.15319752044677734
turbulence 22.71999931335449
trade: 668
cost: 2128.079738628387
rewards 0.34895551193656865
turbulence 22.540000915527344
trade: 686
cost: 2132.6339866333005
rewards 1.1489308433532714
turbulence 22.3700008392334
trade: 703
cost: 2132.6339866333005
rewards 0.05871294167633169
turbulence 22.030000686645508
```

```
trade: 722
cost: 2141.8449896392817
rewards 0.3382977018127451
turbulence 23.270000457763672
trade: 739
cost: 2148.709638687133
rewards 0.22093550095709508
turbulence 24.46999931335449
trade: 755
cost: 2151.373706417083
rewards 0.7776119476318359
turbulence 22.959999084472656
trade: 773
cost: 2151.373706417083
rewards -0.7111670497894288
turbulence 26.40999984741211
trade: 790
cost: 2151.373706417083
rewards -0.23715739898681643
turbulence 26.1200008392334
trade: 809
cost: 2151.373706417083
rewards 2.0401066171497573
turbulence 26.56999969482422
trade: 827
cost: 2160.3455827102657
rewards -2.7710645153381397
turbulence 33.599998474121094
trade: 845
cost: 2200.7171612625116
rewards -0.9544987179092365
turbulence 30.75
trade: 863
cost: 2212.983782188415
rewards -1.301063060174568
turbulence 31.459999084472656
trade: 879
cost: 2219.3677217941276
rewards 1.594874462127674
turbulence 28.809999465942383
trade: 897
cost: 2219.3677217941276
rewards -1.3079955966995098
turbulence 29.709999084472656
trade: 916
cost: 2263.3181078872676
rewards 0.6620829753875733
turbulence 26.8700008392334
```

```
trade: 933
cost: 2263.3181078872676
rewards 1.0821662204666063
turbulence 25.850000381469727
trade: 950
cost: 2271.3057216415405
rewards 0.24461266975402834
turbulence 25.59000015258789
trade: 967
cost: 2271.3057216415405
rewards 0.327874601020827
turbulence 26.040000915527344
trade: 985
cost: 2310.0738105545042
rewards -0.2935364967346192
turbulence 26.459999084472656
trade: 1002
cost: 2310.0738105545042
rewards -0.6609478817936033
turbulence 25.82999992370605
trade: 1020
cost: 2320.6327981681825
rewards -2.328996747298818
turbulence 27.780000686645508
trade: 1038
cost: 2320.664884498596
rewards 0.20659891029682478
turbulence 26.86000061035156
trade: 1056
cost: 2320.695980352402
rewards -1.527367839050293
turbulence 28.57999992370605
trade: 1074
cost: 2320.695980352402
rewards 0.1781143659591675
turbulence 28.51000022888184
trade: 1092
cost: 2320.695980352402
rewards 0.7172228448867798
turbulence 26.3799991607666
trade: 1109
cost: 2320.695980352402
rewards 1.4159677402496338
turbulence 26.190000534057617
trade: 1126
cost: 2320.695980352402
rewards -0.6980971543296822
turbulence 26.270000457763672
```

```
trade: 1145
cost: 2322.7836907176975
rewards 0.8823787943683682
turbulence 26.3700008392334
trade: 1163
cost: 2322.8611416263584
rewards -0.13599648780822754
turbulence 26.700000762939453
trade: 1180
cost: 2322.8611416263584
rewards -0.09945307159423829
turbulence 27.6299991607666
trade: 1197
cost: 2322.8611416263584
rewards 1.4498495149574244
turbulence 27.959999084472656
trade: 1216
cost: 2330.9964909381865
rewards -1.1610405878067016
turbulence 29.479999542236328
trade: 1236
cost: 2330.9964909381865
rewards 1.5513439189784928
turbulence 28.059999465942383
trade: 1254
cost: 2331.0277258052824
rewards 0.9509308361053467
turbulence 26.36000061035156
trade: 1271
cost: 2331.0277258052824
rewards 0.4514584777347744
turbulence 25.0
trade: 1291
cost: 2331.0599337787626
rewards 0.4028720851898194
turbulence 25.06999969482422
trade: 1309
cost: 2331.0599337787626
rewards -1.0140783379512839
turbulence 26.06999969482422
trade: 1329
cost: 2331.0920201091762
rewards -0.4443916515350342
turbulence 26.399999618530277
trade: 1348
cost: 2331.0920201091762
rewards -0.22289152138596402
turbulence 26.96999931335449
```

```
trade: 1367
cost: 2334.268002859115
rewards 0.39889533309936526
turbulence 27.40999984741211
trade: 1387
cost: 2334.268002859115
rewards -1.6028194227920496
turbulence 29.18000030517578
trade: 1404
cost: 2337.578266241073
rewards 0.36867377433775694
turbulence 29.350000381469727
trade: 1421
cost: 2337.578266241073
rewards 0.27252850608825685
turbulence 28.649999618530277
trade: 1440
cost: 2337.578266241073
rewards 0.46171478818666656
turbulence 28.11000061035156
trade: 1456
cost: 2337.646708227157
rewards -0.5283669414520263
turbulence 27.549999237060547
trade: 1473
cost: 2337.646708227157
rewards -2.1973290469307103
turbulence 32.459999084472656
trade: 1490
cost: 2337.7154940319056
rewards -1.135907571876899
turbulence 33.349998474121094
trade: 1509
cost: 2337.750170473098
rewards -2.9164877534111033
turbulence 40.27999877929688
trade: 1525
cost: 2338.428928339004
rewards 0.4390769729614258
turbulence 37.59000015258789
trade: 1542
cost: 2338.428928339004
rewards -0.486675452041626
turbulence 38.02000045776367
trade: 1558
cost: 2338.428928339004
rewards 1.3436802349090577
turbulence 37.130001068115234
```

```
trade: 1575
cost: 2338.428928339004
rewards 1.2571394721984863
turbulence 35.54999923706055
trade: 1592
cost: 2338.428928339004
rewards 0.45051155815124516
turbulence 29.56999969482422
trade: 1609
cost: 2338.428928339004
rewards 1.2935068447113038
turbulence 27.57999992370605
trade: 1627
cost: 2338.428928339004
rewards 0.273796537399292
turbulence 24.86000061035156
trade: 1644
cost: 2338.428928339004
rewards 2.195414612579346
turbulence 25.75
trade: 1663
cost: 2338.428928339004
rewards 1.396727496531303
turbulence 24.799999237060547
trade: 1681
cost: 2347.4916438426967
rewards 0.19319149208068848
turbulence 23.450000762939453
trade: 1700
cost: 2347.4916438426967
rewards -1.3584892556884793
turbulence 25.350000381469727
trade: 1715
cost: 2355.2254482860562
rewards 1.115367774963379
turbulence 23.100000381469727
trade: 1733
cost: 2355.2254482860562
rewards 1.288239372170251
turbulence 22.450000762939453
trade: 1752
cost: 2373.8201527919764
rewards -1.0097125985626132
turbulence 22.709999084472656
trade: 1769
cost: 2392.937425649642
rewards -1.1693618210083108
turbulence 23.84000015258789
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trade: 1785
cost: 2398.216741842269
rewards 0.10635113041382284
turbulence 23.11000061035156
trade: 1803
cost: 2408.9288149318686
rewards -0.529657239151001
turbulence 23.700000762939453
trade: 1820
cost: 2408.9288149318686
rewards 0.8051184532012791
turbulence 22.65999984741211
trade: 1839
cost: 2417.5579959926595
rewards 1.086503706741333
turbulence 21.63999938964844
trade: 1855
cost: 2417.5579959926595
rewards -0.1198538150726119
turbulence 21.25
trade: 1875
cost: 2420.483758108138
rewards -0.015115396050643177
turbulence 20.84000015258789
trade: 1892
cost: 2420.575012620925
rewards -0.4313922921371646
turbulence 20.56999969482422
trade: 1908
cost: 2423.010202058791
rewards 0.9226537666320801
turbulence 20.770000457763672
trade: 1926
cost: 2423.010202058791
rewards -0.1264870376586914
turbulence 21.170000076293945
trade: 1944
cost: 2423.010202058791
rewards 0.039475419640354815
turbulence 21.280000686645508
trade: 1963
cost: 2437.356728921889
rewards 0.9198878517150879
turbulence 20.790000915527344
trade: 1978
cost: 2437.356728921889
rewards -1.0449110211265507
turbulence 21.299999237060547
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trade: 1994
cost: 2438.8499205341327
rewards 0.7697957198677119
turbulence 20.68000030517578
trade: 2010
cost: 2453.174795831679
rewards 0.2720173877632013
turbulence 22.270000457763672
trade: 2028
cost: 2454.1434238452903
rewards -0.3122977375030518
turbulence 22.520000457763672
trade: 2043
cost: 2454.1434238452903
rewards -0.2732019821166992
turbulence 23.309999465942383
trade: 2061
cost: 2454.1434238452903
rewards -0.6802776500701905
turbulence 24.71999931335449
trade: 2080
cost: 2454.1434238452903
rewards 1.1287648540496826
turbulence 22.88999938964844
trade: 2097
cost: 2454.1434238452903
rewards -0.21495903119849974
turbulence 22.5
trade: 2115
cost: 2485.2164819545737
rewards 1.3245401905059815
turbulence 21.93000030517578
trade: 2132
cost: 2485.2164819545737
rewards -0.2259778232574463
turbulence 21.56999969482422
trade: 2149
cost: 2485.2164819545737
rewards -1.068775905227661
turbulence 25.15999984741211
trade: 2163
cost: 2485.2164819545737
rewards -0.6269638404846192
turbulence 24.229999542236328
trade: 2182
cost: 2485.2164819545737
rewards 0.01613626708984375
turbulence 23.309999465942383
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trade: 2198
cost: 2485.2164819545737
rewards 0.5590573562622071
turbulence 21.530000686645508
trade: 2216
cost: 2485.2164819545737
rewards 0.6328952686309814
turbulence 21.700000762939453
trade: 2234
cost: 2485.2164819545737
rewards 0.28268959465026855
turbulence 23.07999992370605
trade: 2251
cost: 2485.2164819545737
rewards 0.614412866973877
turbulence 22.770000457763672
trade: 2267
cost: 2485.2164819545737
rewards 0.8357158489227295
turbulence 22.75
trade: 2283
cost: 2485.2164819545737
rewards -1.1298124977111816
turbulence 26.96999931335449
trade: 2300
cost: 2485.2164819545737
rewards 0.44274628524780274
turbulence 25.34000015258789
trade: 2318
cost: 2485.2164819545737
rewards 0.9814418838500977
turbulence 25.06999969482422
trade: 2333
cost: 2485.2164819545737
rewards 0.33751913833618163
turbulence 22.3700008392334
trade: 2350
cost: 2485.2164819545737
rewards 0.3131108180999756
turbulence 21.559999465942383
trade: 2368
cost: 2485.2164819545737
rewards -0.4799946891784668
turbulence 24.07999992370605
trade: 2384
cost: 2485.2164819545737
rewards -0.07032547492980958
turbulence 23.32999992370605
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trade: 2403
cost: 2485.2164819545737
rewards 0.3225157543182373
turbulence 22.209999084472656
trade: 2419
cost: 2485.2164819545737
rewards -0.14199205207824708
turbulence 23.25
trade: 2436
cost: 2485.2164819545737
rewards 0.1260899887084961
turbulence 24.34000015258789
trade: 2452
cost: 2485.2164819545737
rewards 0.5689496273040772
turbulence 23.239999771118164
trade: 2472
cost: 2485.2164819545737
rewards 0.8743021373748779
turbulence 21.57999992370605
trade: 2488
cost: 2485.2164819545737
rewards 0.6072341865539551
turbulence 21.31999969482422
trade: 2507
cost: 2491.692228109359
rewards -1.0430504824142437
turbulence 21.90999984741211
trade: 2525
cost: 2513.8562548274986
rewards 0.4452945762634278
turbulence 23.190000534057617
trade: 2542
cost: 2513.8562548274986
rewards 0.841929235167685
turbulence 23.020000457763672
trade: 2559
cost: 2529.1911843395224
rewards -2.654239834213257
turbulence 37.209999084472656
trade: 2577
cost: 2529.1911843395224
rewards 1.0107906650543212
turbulence 30.209999084472656
trade: 2595
cost: 2529.1911843395224
rewards -2.7885025005340576
turbulence 33.09000015258789
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trade: 2613
cost: 2529.1911843395224
rewards 0.6841654327392579
turbulence 30.239999771118164
trade: 2632
cost: 2529.1911843395224
rewards 0.5229226336250314
turbulence 25.559999465942383
trade: 2650
cost: 2532.731483983993
rewards -0.3003814277648926
turbulence 22.90999984741211
trade: 2666
cost: 2532.731483983993
rewards 2.0113997222900393
turbulence 21.770000457763672
trade: 2686
cost: 2532.731483983993
rewards 0.6529729515075684
turbulence 20.8700008392334
trade: 2705
cost: 2532.731483983993
rewards 0.2932208465576172
turbulence 21.239999771118164
trade: 2723
cost: 2532.731483983993
rewards 0.33865536727905277
turbulence 21.6299991607666
trade: 2741
cost: 2532.731483983993
rewards 0.09578491287231446
turbulence 21.989999771118164
trade: 2759
cost: 2532.731483983993
rewards 0.25153989248201253
turbulence 21.25
trade: 2778
cost: 2533.8915496425625
rewards 0.17348242073059084
turbulence 19.96999931335449
trade: 2794
cost: 2533.8915496425625
rewards -0.3975423320770264
turbulence 21.459999084472656
trade: 2810
cost: 2533.8915496425625
rewards 0.6236402153015137
turbulence 21.5
```

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trade: 2827
cost: 2533.8915496425625
rewards 0.3081563346862793
turbulence 22.489999771118164
trade: 2845
cost: 2533.8915496425625
rewards -1.4926902960468318
turbulence 22.049999237060547
trade: 2861
cost: 2541.8676836338045
rewards 0.19679012413024904
turbulence 23.450000762939453
trade: 2878
cost: 2541.8676836338045
rewards -0.2196648655510042
turbulence 23.11000061035156
trade: 2899
cost: 2541.95800097847
rewards 1.4793053897857666
turbulence 21.34000015258789
trade: 2913
cost: 2541.95800097847
rewards -1.422403175354004
turbulence 28.88999938964844
trade: 2931
cost: 2541.95800097847
rewards -1.6937901210784914
turbulence 27.950000762939453
trade: 2947
cost: 2541.95800097847
rewards 1.59691492146377
turbulence 23.350000381469727
trade: 2960
cost: 2550.1689967594148
rewards -0.4819206144500524
turbulence 24.100000381469727
trade: 2977
cost: 2580.565208551407
rewards -0.880423093032837
turbulence 26.670000076293945
trade: 2994
cost: 2580.565208551407
rewards -1.8585984489440919
turbulence 28.56999969482422
trade: 3010
cost: 2580.565208551407
rewards 2.20613699798584
turbulence 24.65999984741211
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trade: 3026
cost: 2580.565208551407
rewards 1.466604228832992
turbulence 25.46999931335449
trade: 3043
cost: 2583.2412658634184
rewards 0.4803106172027532
turbulence 24.030000686645508
trade: 3059
cost: 2596.382087854385
rewards 1.308838592833723
turbulence 22.559999465942383
trade: 3075
cost: 2609.78746505928
rewards 0.2742956302642822
turbulence 21.90999984741211
trade: 3094
cost: 2609.78746505928
rewards 0.3925771366119385
turbulence 20.690000534057617
trade: 3108
cost: 2609.78746505928
rewards 0.8326958354461705
turbulence 20.030000686645508
trade: 3122
cost: 2660.2123503437037
rewards 0.5155782745361328
turbulence 19.790000915527344
trade: 3140
cost: 2660.2123503437037
rewards 0.04695186920166016
turbulence 19.229999542236328
trade: 3157
cost: 2660.2123503437037
rewards -0.5279961990356445
turbulence 21.57999992370605
trade: 3173
cost: 2660.2123503437037
rewards -1.7347050163269044
turbulence 20.950000762939453
trade: 3193
cost: 2660.2123503437037
rewards 0.4404388511657715
turbulence 18.8799991607666
trade: 3211
cost: 2660.2123503437037
rewards -0.3511089569091797
turbulence 20.299999237060547
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trade: 3226
cost: 2660.2123503437037
rewards 0.6148064895629883
turbulence 21.200000762939453
trade: 3244
cost: 2660.2123503437037
rewards 0.6319416625976563
turbulence 19.809999465942383
trade: 3259
cost: 2660.2123503437037
rewards 2.3086688499450685
turbulence 18.86000061035156
trade: 3279
cost: 2660.2123503437037
rewards 0.3897822654724121
turbulence 20.739999771118164
trade: 3295
cost: 2660.2123503437037
rewards -0.6619119575500488
turbulence 19.61000061035156
trade: 3313
cost: 2660.2123503437037
rewards -0.573157202911377
turbulence 19.399999618530277
trade: 3332
cost: 2660.2123503437037
rewards 0.33230712814331054
turbulence 17.329999923706055
trade: 3348
cost: 2660.2123503437037
rewards 1.295961738586426
turbulence 17.90999984741211
trade: 3364
cost: 2660.2123503437037
rewards -0.2824514945983887
turbulence 18.1200008392334
trade: 3381
cost: 2660.2123503437037
rewards 0.24479692449339202
turbulence 17.15999984741211
trade: 3397
cost: 2666.972177980422
rewards -0.18616295623779297
turbulence 16.950000762939453
trade: 3414
cost: 2666.972177980422
rewards 0.28480664749145507
turbulence 16.690000534057617
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trade: 3431
cost: 2666.972177980422
rewards -0.3213891639709473
turbulence 16.90999984741211
trade: 3449
cost: 2666.972177980422
rewards -0.6983520924682497
turbulence 16.649999618530273
trade: 3468
cost: 2682.0184322528835
rewards 0.38818496284484866
turbulence 16.989999771118164
trade: 3483
cost: 2682.0184322528835
rewards 0.6691712024688721
turbulence 16.56999969482422
trade: 3501
cost: 2682.0184322528835
rewards 1.0284994246559218
turbulence 16.25
trade: 3519
cost: 2700.6597447757717
rewards -0.29373045349121096
turbulence 17.290000915527344
trade: 3536
cost: 2700.6597447757717
rewards 0.8873342509940966
turbulence 18.68000030517578
trade: 3556
cost: 2700.7074859943386
rewards 0.9272426207065583
turbulence 17.5
trade: 3574
cost: 2700.7548278179165
rewards -1.0279518234252931
turbulence 18.709999084472656
trade: 3589
cost: 2700.7548278179165
rewards 0.2915668832591968
turbulence 17.329999923706055
trade: 3607
cost: 2700.801495103836
rewards -0.9117534450225765
turbulence 17.639999389648438
trade: 3624
cost: 2700.8485529041286
rewards -0.3305486743927002
turbulence 17.559999465942383
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trade: 3639
cost: 2700.8485529041286
rewards -0.24174882097700612
turbulence 17.280000686645508
trade: 3656
cost: 2700.8951580600733
rewards 1.474838074874878
turbulence 17.610000610351562
trade: 3676
cost: 2700.8951580600733
rewards -0.9706277285667603
turbulence 18.61000061035156
trade: 3693
cost: 2700.9419673480984
rewards 1.2102213792377619
turbulence 18.309999465942383
trade: 3712
cost: 2700.9895503978723
rewards 0.9073501216888428
turbulence 19.479999542236328
trade: 3730
cost: 2700.9895503978723
rewards -0.28021636352539064
turbulence 19.149999618530277
trade: 3746
cost: 2700.9895503978723
rewards 0.957362395281205
turbulence 18.38999938964844
trade: 3763
cost: 2701.0373390712734
rewards 0.39708210296630864
turbulence 16.690000534057617
trade: 3782
cost: 2701.0373390712734
rewards 0.03155097846984863
turbulence 19.65999984741211
trade: 3799
cost: 2701.0373390712734
rewards -1.7489457393646242
turbulence 21.84000015258789
trade: 3817
cost: 2701.0373390712734
rewards -1.9591226994537283
turbulence 27.59000015258789
trade: 3833
cost: 2707.0526293544767
rewards 1.7768495329887375
turbulence 23.1299991607666
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trade: 3850
cost: 2711.909357877731
rewards 0.7314938579559327
turbulence 18.809999465942383
trade: 3864
cost: 2711.909357877731
rewards -0.15519758377075196
turbulence 19.71999931335449
trade: 3880
cost: 2711.909357877731
rewards -0.6457522632598878
turbulence 21.34000015258789
trade: 3896
cost: 2711.909357877731
rewards -0.3817485828575213
turbulence 22.18000030517578
trade: 3913
cost: 2717.6111364650724
rewards 0.8219724105834961
turbulence 20.670000076293945
trade: 3925
cost: 2717.6111364650724
rewards 0.019147835922241212
turbulence 20.149999618530277
trade: 3942
cost: 2717.6111364650724
rewards 0.4641473052055342
turbulence 18.399999618530277
trade: 3957
cost: 2720.284629819869
rewards -0.38541704679946415
turbulence 18.84000015258789
trade: 3975
cost: 2725.4824034175867
rewards -0.3973893821716309
turbulence 17.360000610351562
trade: 3993
cost: 2725.4824034175867
rewards 0.28910728187561036
turbulence 16.739999771118164
trade: 4010
cost: 2725.4824034175867
rewards 0.14722249870300294
turbulence 16.760000228881836
trade: 4028
cost: 2725.4824034175867
rewards -1.188023246383667
turbulence 17.899999618530273
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trade: 4043
cost: 2725.4824034175867
rewards 0.5187383399963379
turbulence 17.479999542236328
trade: 4060
cost: 2725.4824034175867
rewards -0.31005757751464846
turbulence 18.040000915527344
trade: 4076
cost: 2725.4824034175867
rewards 0.3154376792907715
turbulence 16.420000076293945
trade: 4093
cost: 2725.4824034175867
rewards -0.584800008392334
turbulence 16.420000076293945
trade: 4109
cost: 2725.4824034175867
rewards -0.2804166989913909
turbulence 17.06999969482422
trade: 4125
cost: 2730.3923361415855
rewards 0.3886813720703125
turbulence 17.889999389648438
trade: 4142
cost: 2730.3923361415855
rewards 0.8059309944152833
turbulence 16.100000381469727
trade: 4160
cost: 2730.3923361415855
rewards -0.19062656326293947
turbulence 15.649999618530272
trade: 4175
cost: 2730.3923361415855
rewards -0.15223569412231447
turbulence 16.389999389648438
trade: 4190
cost: 2730.3923361415855
rewards -0.4089769309997559
turbulence 17.020000457763672
trade: 4205
cost: 2730.3923361415855
rewards -0.8156719081878663
turbulence 18.149999618530277
trade: 4224
cost: 2730.3923361415855
rewards 0.01825145034790039
turbulence 17.75
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trade: 4239
cost: 2730.3923361415855
rewards -1.9148149963211036
turbulence 20.700000762939453
trade: 4258
cost: 2732.6110363826747
rewards 1.7296404735565187
turbulence 17.889999389648438
trade: 4275
cost: 2732.6110363826747
rewards 0.2944914001464844
turbulence 16.65999984741211
trade: 4292
cost: 2732.6110363826747
rewards -0.6699113586425781
turbulence 16.31999969482422
trade: 4312
cost: 2732.6110363826747
rewards 0.7111906036376954
turbulence 15.970000267028809
trade: 4328
cost: 2732.6110363826747
rewards 0.6015206539154053
turbulence 15.619999885559082
trade: 4344
cost: 2732.6110363826747
rewards -0.4414254280090332
turbulence 15.760000228881836
trade: 4363
cost: 2732.6110363826747
rewards 0.25681150665283203
turbulence 16.020000457763672
trade: 4377
cost: 2732.6110363826747
rewards 0.08013090896606445
turbulence 15.829999923706056
trade: 4392
cost: 2732.6110363826747
rewards 0.8324245509338333
turbulence 15.479999542236328
trade: 4407
cost: 2750.7366169795982
rewards 1.1664008686065674
turbulence 15.06999969482422
trade: 4422
cost: 2750.7366169795982
rewards -0.5714387226104737
turbulence 16.440000534057617
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trade: 4440
cost: 2750.7366169795982
rewards 0.8643638847351075
turbulence 16.200000762939453
trade: 4457
cost: 2750.7366169795982
rewards -1.0751529502868653
turbulence 19.0
trade: 4474
cost: 2750.7366169795982
rewards 1.134620425796509
turbulence 16.18000030517578
trade: 4490
cost: 2750.7366169795982
rewards -0.029912672235863285
turbulence 16.170000076293945
trade: 4505
cost: 2753.9659127330774
rewards 0.033140454864501956
turbulence 17.1200008392334
trade: 4523
cost: 2753.9659127330774
rewards 0.8790311698913574
turbulence 16.329999923706055
trade: 4540
cost: 2753.9659127330774
rewards -0.15415737762451173
turbulence 17.010000228881836
trade: 4558
cost: 2753.9659127330774
rewards -0.3141623382568359
turbulence 18.450000762939453
trade: 4576
cost: 2753.9659127330774
rewards -1.915910869216919
turbulence 22.5
trade: 4591
cost: 2753.9659127330774
rewards 1.181423125076294
turbulence 19.729999542236328
trade: 4609
cost: 2753.9659127330774
rewards 0.7364924835205079
turbulence 17.90999984741211
trade: 4629
cost: 2753.9659127330774
rewards -0.09720822907791007
turbulence 17.690000534057617
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trade: 4647
cost: 2762.745678945541
rewards 1.1089398551940919
turbulence 17.200000762939453
trade: 4662
cost: 2762.745678945541
rewards 0.33796624870300296
turbulence 17.579999923706055
trade: 4679
cost: 2762.745678945541
rewards 0.1392389072418213
turbulence 19.36000061035156
trade: 4699
cost: 2762.745678945541
rewards -0.9806917179107667
turbulence 18.309999465942383
trade: 4716
cost: 2762.745678945541
rewards 0.4523984920501709
turbulence 17.700000762939453
trade: 4733
cost: 2762.745678945541
rewards -0.16911505393981935
turbulence 18.239999771118164
trade: 4749
cost: 2762.745678945541
rewards -0.7167796148200986
turbulence 19.459999084472656
trade: 4768
cost: 2762.8477734966273
rewards 0.7522605224609376
turbulence 18.040000915527344
trade: 4786
cost: 2762.8477734966273
rewards -0.6721664766937262
turbulence 17.969999313354492
trade: 4802
cost: 2773.2054306011196
rewards 0.7260810501098633
turbulence 17.280000686645508
trade: 4821
cost: 2773.2054306011196
rewards -0.01821085548400879
turbulence 16.149999618530273
trade: 4839
cost: 2773.2054306011196
rewards -0.028287204360961916
turbulence 16.719999313354492
```

```
trade: 4852
cost: 2773.2054306011196
rewards 0.015589352798461915
turbulence 16.790000915527344
trade: 4870
cost: 2773.2054306011196
rewards 0.289819771194458
turbulence 16.170000076293945
trade: 4885
cost: 2773.2054306011196
rewards 0.05614024429321289
turbulence 15.59000015258789
trade: 4904
cost: 2773.2054306011196
rewards 0.3476816276550293
turbulence 15.449999809265137
trade: 4922
cost: 2773.2054306011196
rewards 1.1436184261322022
turbulence 16.1200008392334
trade: 4939
cost: 2773.2054306011196
rewards -0.28056888656616213
turbulence 17.90999984741211
trade: 4955
cost: 2773.2054306011196
rewards -1.1906473602294922
turbulence 21.56999969482422
trade: 4971
cost: 2773.2054306011196
rewards 0.5219507091522217
turbulence 21.670000076293945
trade: 4989
cost: 2773.2054306011196
rewards 0.6899481601715088
turbulence 18.559999465942383
trade: 5005
cost: 2773.2054306011196
rewards 0.04365179824829102
turbulence 17.149999618530273
trade: 5019
cost: 2773.2054306011196
rewards -0.7404173057556153
turbulence 17.219999313354492
trade: 5038
cost: 2773.2054306011196
rewards -0.3973331008911133
turbulence 16.790000915527344
```

```
trade: 5057
cost: 2773.2054306011196
rewards -1.000574626336666
turbulence 18.84000015258789
trade: 5076
cost: 2775.489833311081
rewards 0.4719069171905518
turbulence 16.389999389648438
trade: 5095
cost: 2775.489833311081
rewards 0.022314459609985352
turbulence 16.190000534057617
trade: 5111
cost: 2775.489833311081
rewards -0.24938764877319336
turbulence 16.479999542236328
trade: 5126
cost: 2775.489833311081
rewards 0.13331823616027833
turbulence 16.110000610351562
trade: 5142
cost: 2775.489833311081
rewards 0.22378411979675294
turbulence 16.40999984741211
trade: 5158
cost: 2775.489833311081
rewards 0.11994995460510255
turbulence 16.40999984741211
trade: 5174
cost: 2775.489833311081
rewards -1.0794462287902833
turbulence 18.13999938964844
trade: 5191
cost: 2775.489833311081
rewards 0.38984731636047365
turbulence 17.959999084472656
trade: 5205
cost: 2775.489833311081
rewards -1.3977189601898194
turbulence 18.799999237060547
trade: 5223
cost: 2775.489833311081
rewards -0.6553994449615479
turbulence 20.950000762939453
trade: 5238
cost: 2775.489833311081
rewards 0.2511049098968506
turbulence 19.3700008392334
```

```
trade: 5254
cost: 2775.489833311081
rewards -0.9011922580718995
turbulence 19.459999084472656
trade: 5271
cost: 2775.489833311081
rewards 0.5000639728546142
turbulence 18.18000030517578
trade: 5287
cost: 2775.489833311081
rewards 0.027135624313354492
turbulence 18.690000534057617
trade: 5304
cost: 2775.489833311081
rewards -0.5760233898162842
turbulence 20.809999465942383
trade: 5323
cost: 2775.489833311081
rewards -1.2213862285614014
turbulence 25.709999084472656
trade: 5339
cost: 2775.489833311081
rewards 0.38359640312194826
turbulence 24.36000061035156
trade: 5359
cost: 2775.489833311081
rewards 0.4399207799297292
turbulence 20.8700008392334
trade: 5379
cost: 2793.5088482837677
rewards 1.1361661094665527
turbulence 18.6299991607666
trade: 5395
cost: 2793.5088482837677
rewards 0.362861979675293
turbulence 17.75
trade: 5410
cost: 2793.5088482837677
rewards -0.23956742553710939
turbulence 18.76000022888184
trade: 5427
cost: 2793.5088482837677
rewards -1.3161630668640136
turbulence 23.25
trade: 5443
cost: 2793.5088482837677
rewards 0.8208411674499512
turbulence 22.559999465942383
```

```
trade: 5460
cost: 2793.5088482837677
rewards -1.9091262977600099
turbulence 23.13999938964844
trade: 5477
cost: 2793.5088482837677
rewards 1.0171926567077638
turbulence 21.100000381469727
trade: 5496
cost: 2793.5088482837677
rewards -1.0701554267883302
turbulence 22.959999084472656
trade: 5515
cost: 2793.5088482837677
rewards 0.42618369369506837
turbulence 21.299999237060547
trade: 5536
cost: 2793.5088482837677
rewards 0.4592790054321289
turbulence 21.0
trade: 5553
cost: 2793.5088482837677
rewards 1.4200829582214356
turbulence 19.540000915527344
trade: 5569
cost: 2793.5088482837677
rewards -0.4213897705078125
turbulence 18.770000457763672
trade: 5585
cost: 2793.5088482837677
rewards -0.8158367431640625
turbulence 20.0
trade: 5602
cost: 2793.5088482837677
rewards -1.1356720258918824
turbulence 19.850000381469727
trade: 5618
cost: 2815.790214838028
rewards 0.2861131790161133
turbulence 18.63999938964844
trade: 5637
cost: 2815.790214838028
rewards 1.134978945541382
turbulence 16.860000610351562
trade: 5656
cost: 2815.790214838028
rewards 1.1667678031921387
turbulence 16.299999237060547
```

```
trade: 5673
cost: 2815.790214838028
rewards -0.5304016597747803
turbulence 16.309999465942383
trade: 5689
cost: 2815.790214838028
rewards 1.9923723587036133
turbulence 15.699999809265137
trade: 5706
cost: 2815.790214838028
rewards 0.1701163906097412
turbulence 15.489999771118164
trade: 5723
cost: 2815.790214838028
rewards 5.524253845214844e-05
turbulence 15.010000228881836
trade: 5742
cost: 2815.790214838028
rewards -0.4554590476989746
turbulence 15.43000030517578
trade: 5757
cost: 2815.790214838028
rewards 0.5017694400787354
turbulence 15.239999771118164
trade: 5775
cost: 2815.790214838028
rewards 0.0233019718170166
turbulence 15.979999542236328
trade: 5792
cost: 2815.790214838028
rewards -2.0067111163791505
turbulence 16.979999542236328
trade: 5809
cost: 2848.5282173137666
rewards -2.0067111163791505
turbulence 16.979999542236328
trade: 5809
cost: 2848.5282173137666
True
False
{}
```

[18]: 1222302.3343868274

[19]:
```python
rewards_ppo = list()
turbulence_ppo = list()
cost_ppo = list()
```

```python
trade_ppo = list()

obs = e_trade_gym.reset()[0]
# print(obs[0])
while True:
    action2, _states2 = trained_ppo.predict(obs)
    obs, rewards, done, info, new = e_trade_gym.step(np.array(action2))
    print('rewards', rewards)
    rewards_ppo.append(rewards)
    print('turbulence', e_trade_gym.turbulence)
    turbulence_ppo.append(e_trade_gym.turbulence)
    print('trade:', e_trade_gym.trades)
    trade_ppo.append(e_trade_gym.trades)
    print('cost:', e_trade_gym.cost)
    cost_ppo.append(e_trade_gym.cost)
    if done:
        print(done)
        print(info)
        print(new)
        break
e_trade_gym.asset_memory[-1]
```

rewards 0.02567107010612963
turbulence 27.68000030517578
trade: 15
cost: 110.74384300613404
rewards 0.26030618337021444
turbulence 27.940000534057617
trade: 34
cost: 253.4115281944275
rewards -0.4173367756950436
turbulence 29.43000030517578
trade: 56
cost: 412.56323595047
rewards 0.08285099929582794
turbulence 28.07999992370605
trade: 79
cost: 639.6392186393739
rewards -0.6481237671539187
turbulence 29.26000022888184
trade: 102
cost: 855.0542354545597
rewards 0.7071180003433023
turbulence 27.290000915527344
trade: 128
cost: 1130.1804186973575
rewards 0.19273176982651932

```
turbulence 32.189998626708984
trade: 157
cost: 1358.8062247657779
rewards 1.35022429829638
turbulence 29.520000457763672
trade: 184
cost: 1593.2721041069028
rewards 0.4604637201614329
turbulence 27.76000022888184
trade: 209
cost: 1823.6457019004822
rewards -0.031519779317476786
turbulence 28.0
trade: 235
cost: 2067.2237097663888
rewards 0.04199546803437407
turbulence 25.68000030517578
trade: 260
cost: 2295.123510166169
rewards -0.024390491670998746
turbulence 24.459999084472656
trade: 285
cost: 2492.4366719627387
rewards 0.28593643481064357
turbulence 24.84000015258789
trade: 309
cost: 2713.3938685035714
rewards 0.30431362975769444
turbulence 24.31999969482422
trade: 336
cost: 2907.2075335426334
rewards -0.4877345856361557
turbulence 26.07999992370605
trade: 364
cost: 3159.546573040009
rewards -0.8270126732231001
turbulence 25.84000015258789
trade: 390
cost: 3370.987888095856
rewards 0.0827377094413736
turbulence 24.739999771118164
trade: 418
cost: 3596.6928134880072
rewards -0.10577595730973408
turbulence 25.440000534057617
trade: 444
cost: 3772.2111069831867
rewards 0.5130531697448693
```

```
turbulence 24.100000381469727
trade: 471
cost: 4013.583626300813
rewards -0.8531433591236128
turbulence 24.76000022888184
trade: 497
cost: 4220.018407722475
rewards -0.6360700837501674
turbulence 24.459999084472656
trade: 522
cost: 4478.451018600465
rewards 0.29741540815009504
turbulence 24.280000686645508
trade: 548
cost: 4697.35963164902
rewards 0.3772743345069932
turbulence 23.76000022888184
trade: 574
cost: 4926.879641834262
rewards 1.1751697010189062
turbulence 22.989999771118164
trade: 599
cost: 5171.071849021912
rewards 0.05536558996773092
turbulence 22.649999618530277
trade: 626
cost: 5383.460073947908
rewards 0.8605654540580697
turbulence 22.209999084472656
trade: 652
cost: 5623.6785268363965
rewards 1.3722021333992016
turbulence 22.1299991607666
trade: 676
cost: 5827.13215698624
rewards -0.11494451804276323
turbulence 24.030000686645508
trade: 700
cost: 5998.588552623752
rewards 0.768534475420008
turbulence 22.280000686645508
trade: 722
cost: 6193.989869285586
rewards -0.40570761546555445
turbulence 22.1299991607666
trade: 745
cost: 6296.233367080691
rewards 0.015002155607228633
```

```
turbulence 22.049999237060547
trade: 770
cost: 6489.49633401871
rewards -0.3634482812225353
turbulence 21.350000381469727
trade: 795
cost: 6687.191464664462
rewards -0.395640659238433
turbulence 21.51000022888184
trade: 824
cost: 6797.4523127250695
rewards -0.3736735854099272
turbulence 22.540000915527344
trade: 850
cost: 6919.686671463015
rewards -0.09101182488403284
turbulence 22.71999931335449
trade: 876
cost: 7106.201618301395
rewards 0.1546035166461952
turbulence 22.540000915527344
trade: 903
cost: 7246.006375698092
rewards 1.0455173274242435
turbulence 22.3700008392334
trade: 930
cost: 7446.300913040163
rewards 1.0219019176792237
turbulence 22.030000686645508
trade: 958
cost: 7640.541768901825
rewards 1.1755541607700288
turbulence 23.270000457763672
trade: 986
cost: 7929.572163612366
rewards 1.1848478325355565
turbulence 24.46999931335449
trade: 1012
cost: 8073.735836547853
rewards 0.7182520350051811
turbulence 22.959999084472656
trade: 1040
cost: 8309.174108474737
rewards -0.8464214544208488
turbulence 26.40999984741211
trade: 1069
cost: 8567.020740390784
rewards 0.3783914859504672
```

turbulence 26.1200008392334
trade: 1097
cost: 8844.239069133768
rewards 2.157223805881315
turbulence 26.56999969482422
trade: 1123
cost: 9025.24057712365
rewards -2.372462434942252
turbulence 33.599998474121094
trade: 1149
cost: 9298.50076791574
rewards -0.1482550316711422
turbulence 30.75
trade: 1177
cost: 9466.969446290985
rewards -1.9951512984573143
turbulence 31.459999084472656
trade: 1204
cost: 9726.156030107513
rewards 1.1855365475162398
turbulence 28.809999465942383
trade: 1230
cost: 9911.425721113219
rewards -1.2799254235565198
turbulence 29.709999084472656
trade: 1256
cost: 10119.015058759707
rewards 0.7252715824619401
turbulence 26.8700008392334
trade: 1282
cost: 10325.443059671425
rewards 1.3722607314361492
turbulence 25.850000381469727
trade: 1308
cost: 10535.157072519325
rewards -0.3163167202629149
turbulence 25.59000015258789
trade: 1335
cost: 10755.659247530006
rewards 0.1401077411067905
turbulence 26.040000915527344
trade: 1362
cost: 11017.833617925666
rewards -0.45356346267699266
turbulence 26.459999084472656
trade: 1390
cost: 11274.730096960096
rewards -0.7106466179424199

```
turbulence 25.82999992370605
trade: 1417
cost: 11482.745836931257
rewards -2.387052820151148
turbulence 27.780000686645508
trade: 1444
cost: 11769.33433164027
rewards 0.5359536263744347
turbulence 26.86000061035156
trade: 1472
cost: 12035.602579919847
rewards -1.6309729752138025
turbulence 28.57999992370605
trade: 1499
cost: 12313.871932430302
rewards 0.09642044662628323
turbulence 28.51000022888184
trade: 1525
cost: 12512.666626934086
rewards 1.1099838335552137
turbulence 26.3799991607666
trade: 1551
cost: 12637.55785604862
rewards 1.467662743455125
turbulence 26.190000534057617
trade: 1577
cost: 12886.487764026675
rewards -0.5831192342189606
turbulence 26.270000457763672
trade: 1603
cost: 13118.170603805576
rewards 1.3183371248748619
turbulence 26.3700008392334
trade: 1628
cost: 13209.452721145664
rewards 0.43017830513992816
turbulence 26.700000762939453
trade: 1656
cost: 13393.882014869723
rewards -0.6019688338447595
turbulence 27.6299991607666
trade: 1684
cost: 13583.425543594392
rewards 1.9606080730468733
turbulence 27.959999084472656
trade: 1711
cost: 13754.749508636505
rewards -1.0896837025348562
```

turbulence 29.479999542236328
trade: 1737
cost: 14019.295306644473
rewards 2.0882608968524963
turbulence 28.059999465942383
trade: 1765
cost: 14300.911321334872
rewards 0.23576951038015542
turbulence 26.36000061035156
trade: 1793
cost: 14570.225864902532
rewards 0.5746923102936009
turbulence 25.0
trade: 1822
cost: 14820.93446438984
rewards 0.7296023613796104
turbulence 25.06999969482422
trade: 1847
cost: 14907.273422309916
rewards -0.8311793758834712
turbulence 26.06999969482422
trade: 1873
cost: 15126.303093467754
rewards -0.8684488338207361
turbulence 26.399999618530277
trade: 1899
cost: 15341.655487308539
rewards -0.15049448000753765
turbulence 26.96999931335449
trade: 1926
cost: 15590.935885376015
rewards 0.22086125866926742
turbulence 27.40999984741211
trade: 1954
cost: 15844.267085304295
rewards -1.7420811491355765
turbulence 29.18000030517578
trade: 1982
cost: 16057.665231323279
rewards 0.8730376106185839
turbulence 29.350000381469727
trade: 2008
cost: 16200.198926620522
rewards -0.07651024407995866
turbulence 28.649999618530277
trade: 2034
cost: 16400.94740929035
rewards 0.5074264867534628

```
turbulence 28.11000061035156
trade: 2061
cost: 16555.558815864606
rewards -0.6452212324333377
turbulence 27.549999237060547
trade: 2088
cost: 16829.11846456913
rewards -2.8328000822894976
turbulence 32.459999084472656
trade: 2116
cost: 17050.789983722716
rewards -0.6785953882415663
turbulence 33.349998474121094
trade: 2143
cost: 17255.397728138
rewards -3.1500149899808925
turbulence 40.27999877929688
trade: 2169
cost: 17480.232684633273
rewards 0.26930994054871843
turbulence 37.59000015258789
trade: 2192
cost: 17737.443311037077
rewards -0.5208596545654349
turbulence 38.02000045776367
trade: 2219
cost: 17979.41101147654
rewards 1.5801295774662052
turbulence 37.130001068115234
trade: 2246
cost: 18222.941198881173
rewards 1.9824392410415692
turbulence 35.54999923706055
trade: 2273
cost: 18467.61436692621
rewards 0.646756946482847
turbulence 29.56999969482422
trade: 2300
cost: 18720.44456793024
rewards 2.1007234998615227
turbulence 27.57999992370605
trade: 2329
cost: 18939.477437356967
rewards -0.4620536986610387
turbulence 24.86000061035156
trade: 2356
cost: 19131.822643877043
rewards 4.651475080954749
```

```
turbulence 25.75
trade: 2381
cost: 19302.238479379666
rewards 0.6213866027900716
turbulence 24.799999237060547
trade: 2407
cost: 19547.538009340304
rewards -0.4234251139850589
turbulence 23.450000762939453
trade: 2433
cost: 19815.269911672603
rewards -1.261180291623692
turbulence 25.350000381469727
trade: 2461
cost: 20090.483537290573
rewards 1.794225770420069
turbulence 23.100000381469727
trade: 2488
cost: 20318.774069936753
rewards 1.8601010666427669
turbulence 22.450000762939453
trade: 2516
cost: 20522.66274890709
rewards -0.9150674679839984
turbulence 22.709999084472656
trade: 2544
cost: 20753.246642766953
rewards -1.1113424024196574
turbulence 23.84000015258789
trade: 2571
cost: 21000.82958725166
rewards 0.5415081046768232
turbulence 23.11000061035156
trade: 2596
cost: 21241.444303117758
rewards -0.9540508658454987
turbulence 23.700000762939453
trade: 2623
cost: 21529.834843286524
rewards 1.0866607163352893
turbulence 22.65999984741211
trade: 2649
cost: 21748.564155305878
rewards 1.6481984344078229
turbulence 21.63999938964844
trade: 2674
cost: 21959.160732400916
rewards -1.1644444456840632
```

```
turbulence 21.25
trade: 2697
cost: 22100.255324281716
rewards 0.2589373086547945
turbulence 20.84000015258789
trade: 2720
cost: 22274.876687349337
rewards -1.1441650898880094
turbulence 20.56999969482422
trade: 2744
cost: 22412.63556505015
rewards 0.0758205370426178
turbulence 20.770000457763672
trade: 2769
cost: 22591.834258802435
rewards -1.47345792028578
turbulence 21.170000076293945
trade: 2793
cost: 22814.140424703623
rewards 0.4201029658927815
turbulence 21.280000686645508
trade: 2817
cost: 22937.186411222476
rewards 1.2699473845481872
turbulence 20.790000915527344
trade: 2841
cost: 23046.334719976447
rewards -0.7275159509742632
turbulence 21.299999237060547
trade: 2866
cost: 23284.356519147896
rewards 0.39345575514563824
turbulence 20.68000030517578
trade: 2894
cost: 23349.760305734657
rewards -0.959860481920233
turbulence 22.270000457763672
trade: 2919
cost: 23585.568524595292
rewards -0.029678448846074755
turbulence 22.520000457763672
trade: 2943
cost: 23771.065663354893
rewards -0.36442536401518155
turbulence 23.309999465942383
trade: 2968
cost: 23979.562810892123
rewards -0.7632249416610692
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turbulence 24.71999931335449
trade: 2994
cost: 24137.242994562166
rewards 0.782832170927804
turbulence 22.88999938964844
trade: 3019
cost: 24252.949399602905
rewards 0.2549473029041197
turbulence 22.5
trade: 3043
cost: 24370.31690477182
rewards 0.7203386384224054
turbulence 21.93000030517578
trade: 3069
cost: 24551.190324319854
rewards -0.3122178793895757
turbulence 21.56999969482422
trade: 3092
cost: 24761.037056447993
rewards -0.3543688262241194
turbulence 25.15999984741211
trade: 3118
cost: 24987.53881051064
rewards -0.1977189158042893
turbulence 24.229999542236328
trade: 3144
cost: 25163.745436052326
rewards 0.16753290111236274
turbulence 23.309999465942383
trade: 3169
cost: 25429.380807100304
rewards 0.02828225094145164
turbulence 21.530000686645508
trade: 3195
cost: 25661.60375361825
rewards 0.3180060260803206
turbulence 21.700000762939453
trade: 3224
cost: 25909.41618492318
rewards -0.5147984838989098
turbulence 23.07999992370605
trade: 3250
cost: 26140.672027635585
rewards 0.20757574731672648
turbulence 22.770000457763672
trade: 3275
cost: 26345.458610406884
rewards 0.722722411726392

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turbulence 22.75
trade: 3301
cost: 26538.577632791526
rewards -1.3608817172954557
turbulence 26.96999931335449
trade: 3327
cost: 26739.758415060056
rewards 0.4116755528697977
turbulence 25.34000015258789
trade: 3353
cost: 26973.265932626746
rewards 1.465168818293768
turbulence 25.06999969482422
trade: 3380
cost: 27166.590692956946
rewards 0.555104469179525
turbulence 22.3700008392334
trade: 3406
cost: 27403.313026155487
rewards 0.5932218109249138
turbulence 21.559999465942383
trade: 3432
cost: 27522.744426336303
rewards -0.2806271390678361
turbulence 24.07999992370605
trade: 3457
cost: 27646.30713018609
rewards 0.18686800275344867
turbulence 23.32999992370605
trade: 3484
cost: 27784.208493032467
rewards 0.6224356339324965
turbulence 22.209999084472656
trade: 3507
cost: 28015.360694814695
rewards -0.23459945027774667
turbulence 23.25
trade: 3534
cost: 28159.20932356836
rewards -0.9315279136176687
turbulence 24.34000015258789
trade: 3558
cost: 28352.79696575738
rewards 1.3296295528591144
turbulence 23.239999771118164
trade: 3582
cost: 28550.187949159637
rewards 1.5279595408416586
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turbulence 21.57999992370605
trade: 3610
cost: 28648.675277711885
rewards -0.26608340759733695
turbulence 21.31999969482422
trade: 3635
cost: 28805.04981617929
rewards -0.32449212214013096
turbulence 21.90999984741211
trade: 3659
cost: 29013.531706525813
rewards -0.6687082769523608
turbulence 23.190000534057617
trade: 3683
cost: 29165.473580205933
rewards -0.6481655633189949
turbulence 23.020000457763672
trade: 3709
cost: 29344.360693040868
rewards -1.4637606430297951
turbulence 37.209999084472656
trade: 3735
cost: 29524.12550193979
rewards 1.4095158084575554
turbulence 30.209999084472656
trade: 3760
cost: 29760.816580419563
rewards -1.825631529214466
turbulence 33.09000015258789
trade: 3784
cost: 29962.09672394373
rewards 0.45030024040183053
turbulence 30.239999771118164
trade: 3808
cost: 30083.615186319366
rewards 2.0282679221992614
turbulence 25.559999465942383
trade: 3832
cost: 30203.123201112758
rewards 0.24774524899444078
turbulence 22.90999984741211
trade: 3854
cost: 30429.26424754526
rewards 1.8333705265152036
turbulence 21.770000457763672
trade: 3875
cost: 30492.24019577219
rewards 0.4874796545570484
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turbulence 20.8700008392334
trade: 3899
cost: 30577.24880309488
rewards 0.6099512150451541
turbulence 21.239999771118164
trade: 3923
cost: 30778.95830181314
rewards -0.625560158229433
turbulence 21.6299991607666
trade: 3946
cost: 30994.000206983575
rewards 0.7071014884139877
turbulence 21.989999771118164
trade: 3972
cost: 31105.90469158746
rewards 0.22526955724754372
turbulence 21.25
trade: 3996
cost: 31332.622681886685
rewards 0.30075106141739527
turbulence 19.96999931335449
trade: 4021
cost: 31507.29129744913
rewards 1.0673729119228432
turbulence 21.459999084472656
trade: 4046
cost: 31543.800291624088
rewards 0.0287800050994847
turbulence 21.5
trade: 4071
cost: 31630.570236509342
rewards -0.22625341911239086
turbulence 22.489999771118164
trade: 4094
cost: 31828.169552145024
rewards 0.3294312756076688
turbulence 22.049999237060547
trade: 4119
cost: 32092.70495204355
rewards -0.27316574378700464
turbulence 23.450000762939453
trade: 4143
cost: 32365.011639944085
rewards -0.8436007375373739
turbulence 23.11000061035156
trade: 4169
cost: 32511.66467571832
rewards 1.344456568111037
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turbulence 21.34000015258789
trade: 4194
cost: 32561.066378946314
rewards -2.8618966587898322
turbulence 28.88999938964844
trade: 4219
cost: 32716.239811174397
rewards -3.002717616513814
turbulence 27.950000762939453
trade: 4242
cost: 32979.9980609684
rewards 1.7345697740318256
turbulence 23.350000381469727
trade: 4268
cost: 33073.43742086983
rewards -0.8476040299133165
turbulence 24.100000381469727
trade: 4291
cost: 33301.34732983589
rewards -0.4412735175083159
turbulence 26.670000076293945
trade: 4316
cost: 33493.04620425988
rewards -0.8329601670734352
turbulence 28.56999969482422
trade: 4340
cost: 33673.019651575094
rewards 2.558019850868988
turbulence 24.65999984741211
trade: 4360
cost: 33849.27028534127
rewards 0.8713175442317966
turbulence 25.46999931335449
trade: 4387
cost: 34054.36567127038
rewards -0.2224386812019395
turbulence 24.030000686645508
trade: 4414
cost: 34288.83816139032
rewards 1.4085980711166515
turbulence 22.559999465942383
trade: 4440
cost: 34483.59663555718
rewards 0.9862881830085535
turbulence 21.90999984741211
trade: 4465
cost: 34614.084228384025
rewards 0.891359877442196
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turbulence 20.690000534057617
trade: 4488
cost: 34870.67262208367
rewards 0.3038110748870764
turbulence 20.030000686645508
trade: 4512
cost: 35074.203787580496
rewards -0.8883658294731053
turbulence 19.790000915527344
trade: 4537
cost: 35161.54220850183
rewards 0.604008219818119
turbulence 19.229999542236328
trade: 4559
cost: 35397.61555460169
rewards -0.8776436666809255
turbulence 21.57999992370605
trade: 4582
cost: 35651.6604825192
rewards -1.0012147687431192
turbulence 20.950000762939453
trade: 4608
cost: 35860.987475980815
rewards 0.16424927815094126
turbulence 18.8799991607666
trade: 4634
cost: 36118.38440012937
rewards -1.355148023896804
turbulence 20.299999237060547
trade: 4659
cost: 36350.49828701596
rewards 0.023160110195935706
turbulence 21.200000762939453
trade: 4686
cost: 36522.565878599205
rewards 0.3488822223545052
turbulence 19.809999465942383
trade: 4709
cost: 36752.726862756754
rewards 1.7181494374607225
turbulence 18.86000061035156
trade: 4733
cost: 36912.94361638453
rewards 0.260994429397583
turbulence 20.739999771118164
trade: 4759
cost: 37118.26573323633
rewards -0.16378717377472204
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turbulence 19.61000061035156
trade: 4783
cost: 37367.02970960047
rewards -0.19394510372926016
turbulence 19.399999618530277
trade: 4805
cost: 37544.668521551146
rewards 1.2921704173607054
turbulence 17.329999923706055
trade: 4827
cost: 37665.95730601311
rewards 1.4388296523391735
turbulence 17.90999984741211
trade: 4851
cost: 37826.85680465508
rewards -0.12312782239227091
turbulence 18.1200008392334
trade: 4875
cost: 37933.96197102164
rewards 0.13738401212538592
turbulence 17.15999984741211
trade: 4899
cost: 38176.62620615196
rewards 0.03675488256530371
turbulence 16.950000762939453
trade: 4923
cost: 38428.4291909542
rewards 1.503059937253967
turbulence 16.690000534057617
trade: 4949
cost: 38578.42711608314
rewards -0.3003199915687554
turbulence 16.90999984741211
trade: 4976
cost: 38684.96472784615
rewards 0.0076856929256347946
turbulence 16.649999618530273
trade: 4999
cost: 38855.58013440515
rewards 0.007258609437174164
turbulence 16.989999771118164
trade: 5024
cost: 38946.140699884425
rewards 1.0751677141613094
turbulence 16.56999969482422
trade: 5046
cost: 39020.62354286004
rewards 0.40181303909607236

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turbulence 16.25
trade: 5069
cost: 39211.30599140741
rewards -0.5635276465923292
turbulence 17.290000915527344
trade: 5093
cost: 39382.95267370033
rewards -0.40527668057023547
turbulence 18.68000030517578
trade: 5115
cost: 39605.40486987494
rewards 1.2896691600540189
turbulence 17.5
trade: 5139
cost: 39817.91320524786
rewards -0.8084380842239364
turbulence 18.709999084472656
trade: 5161
cost: 39961.9714118366
rewards 0.330602714392473
turbulence 17.329999923706055
trade: 5180
cost: 40025.01340929983
rewards 0.35976852910690943
turbulence 17.639999389648438
trade: 5202
cost: 40270.26202097126
rewards -0.29768576196860524
turbulence 17.559999465942383
trade: 5226
cost: 40480.83472854801
rewards -0.3696653574810131
turbulence 17.280000686645508
trade: 5250
cost: 40606.38871305652
rewards 0.6170577718822519
turbulence 17.610000610351562
trade: 5273
cost: 40828.19228085513
rewards -0.7044204975822476
turbulence 18.61000061035156
trade: 5295
cost: 41016.78130513949
rewards 0.7397743960578926
turbulence 18.309999465942383
trade: 5320
cost: 41264.950274095485
rewards -0.2277893682842143
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turbulence 19.479999542236328
trade: 5342
cost: 41442.162556638665
rewards 0.3668177730697673
turbulence 19.149999618530277
trade: 5368
cost: 41593.702439161265
rewards 1.0736036386329681
turbulence 18.38999938964844
trade: 5393
cost: 41788.542471899
rewards 0.5836782188125653
turbulence 16.690000534057617
trade: 5415
cost: 41954.04418880268
rewards -0.017088023992162197
turbulence 19.65999984741211
trade: 5440
cost: 42055.43136384388
rewards -1.7264128936084686
turbulence 21.84000015258789
trade: 5466
cost: 42329.991711671806
rewards -2.3833137429748663
turbulence 27.59000015258789
trade: 5489
cost: 42462.331144899326
rewards 1.6953666241664906
turbulence 23.1299991607666
trade: 5512
cost: 42589.52795560261
rewards 1.4356732343978948
turbulence 18.809999465942383
trade: 5536
cost: 42730.980757955505
rewards -0.32479701125489086
turbulence 19.71999931335449
trade: 5557
cost: 42873.91698454852
rewards -1.0439530110652793
turbulence 21.34000015258789
trade: 5580
cost: 42940.342942522
rewards 0.37312447076872923
turbulence 22.18000030517578
trade: 5600
cost: 43088.436186494786
rewards 0.9607388524280629

turbulence 20.670000076293945
trade: 5623
cost: 43252.97940965076
rewards 0.27728200728835073
turbulence 20.149999618530277
trade: 5648
cost: 43440.93879004473
rewards 0.9025567419563421
turbulence 18.399999618530277
trade: 5674
cost: 43588.2546445598
rewards -0.4470640083988197
turbulence 18.84000015258789
trade: 5700
cost: 43786.033812410285
rewards -0.08627065050124656
turbulence 17.360000610351562
trade: 5725
cost: 44073.98997410003
rewards 0.034596492416365074
turbulence 16.739999771118164
trade: 5751
cost: 44260.40367389864
rewards 1.494047854056931
turbulence 16.760000228881836
trade: 5775
cost: 44532.07597027391
rewards 0.229298539720173
turbulence 17.899999618530273
trade: 5799
cost: 44731.87382960314
rewards 0.06335062475127634
turbulence 17.479999542236328
trade: 5821
cost: 44978.81154418748
rewards -0.05628699617423118
turbulence 18.040000915527344
trade: 5846
cost: 45256.04478336519
rewards 0.853502244955441
turbulence 16.420000076293945
trade: 5871
cost: 45547.464602182314
rewards -0.35011990445023405
turbulence 16.420000076293945
trade: 5897
cost: 45717.279106126705
rewards -0.2673617178714601

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turbulence 17.06999969482422
trade: 5923
cost: 45963.81717183487
rewards -0.6332873571651523
turbulence 17.889999389648438
trade: 5949
cost: 46156.05946830934
rewards 0.6820723174480489
turbulence 16.100000381469727
trade: 5972
cost: 46394.219045293765
rewards 0.14056758849411272
turbulence 15.649999618530272
trade: 5998
cost: 46661.622643384886
rewards 0.03343011401176919
turbulence 16.389999389648438
trade: 6026
cost: 46873.467384920084
rewards 0.012990808717347683
turbulence 17.020000457763672
trade: 6053
cost: 47084.006181901896
rewards -1.0399844676986802
turbulence 18.149999618530277
trade: 6078
cost: 47237.52946682927
rewards -0.737120115603623
turbulence 17.75
trade: 6105
cost: 47435.33445129582
rewards -2.2139952575943203
turbulence 20.700000762939453
trade: 6134
cost: 47703.32112681766
rewards 2.6664499429584483
turbulence 17.889999389648438
trade: 6162
cost: 47896.81850814624
rewards -0.1516426702621393
turbulence 16.65999984741211
trade: 6188
cost: 48201.38657200428
rewards -0.12070001197471283
turbulence 16.31999969482422
trade: 6214
cost: 48393.64786881445
rewards 0.979302264256659
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turbulence 15.970000267028809
trade: 6239
cost: 48629.92647670555
rewards 0.4680201355354395
turbulence 15.619999885559082
trade: 6265
cost: 48852.26780781364
rewards -0.8042953826404643
turbulence 15.760000228881836
trade: 6290
cost: 49041.61292679023
rewards 0.023869206536887216
turbulence 16.020000457763672
trade: 6314
cost: 49223.518655000684
rewards 0.45925684565429115
turbulence 15.829999923706056
trade: 6339
cost: 49507.06415109445
rewards 0.11967654000166804
turbulence 15.479999542236328
trade: 6365
cost: 49623.125243387236
rewards 0.7936958898040932
turbulence 15.06999969482422
trade: 6391
cost: 49793.49437497904
rewards -0.21872376261253376
turbulence 16.440000534057617
trade: 6414
cost: 49870.831042089485
rewards 0.6232822564826813
turbulence 16.200000762939453
trade: 6436
cost: 49984.56124978449
rewards -1.8287699796573493
turbulence 19.0
trade: 6459
cost: 50182.73868078806
rewards 1.9631868907504948
turbulence 16.18000030517578
trade: 6483
cost: 50301.48962344173
rewards 0.3415328847934725
turbulence 16.170000076293945
trade: 6509
cost: 50514.10099157146
rewards -0.5558806561271661
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rewards 0.16745450642853976
turbulence 16.329999923706055
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cost: 50799.94705276684
rewards -0.14729130132980645
turbulence 17.010000228881836
trade: 6577
cost: 50957.551228174256
rewards -0.7687151060409612
turbulence 18.450000762939453
trade: 6602
cost: 51001.97535224347
rewards -2.9829696651207054
turbulence 22.5
trade: 6623
cost: 51214.42442196852
rewards 2.17895085830614
turbulence 19.729999542236328
trade: 6648
cost: 51435.39447278792
rewards 1.370780666040024
turbulence 17.90999984741211
trade: 6672
cost: 51636.32736011702
rewards -0.30762240422209725
turbulence 17.690000534057617
trade: 6694
cost: 51894.43372655684
rewards 0.6605220368438633
turbulence 17.200000762939453
trade: 6719
cost: 52115.73176021774
rewards 0.011270758449193091
turbulence 17.579999923706055
trade: 6744
cost: 52234.02116592988
rewards -0.45913828639031856
turbulence 19.36000061035156
trade: 6769
cost: 52391.38414000138
rewards -0.9661072444221471
turbulence 18.309999465942383
trade: 6794
cost: 52621.32759023485
rewards 0.743234190444951

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turbulence 17.700000762939453
trade: 6822
cost: 52804.18606420333
rewards -0.48831790539931974
turbulence 18.239999771118164
trade: 6845
cost: 53149.31347482499
rewards -0.3707088829994202
turbulence 19.459999084472656
trade: 6867
cost: 53374.56420057114
rewards 0.845375955926138
turbulence 18.040000915527344
trade: 6894
cost: 53667.07590824706
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turbulence 17.969999313354492
trade: 6922
cost: 53752.15719200713
rewards 0.4782027925651521
turbulence 17.280000686645508
trade: 6949
cost: 54053.15258941465
rewards 0.7685488451019162
turbulence 16.149999618530273
trade: 6975
cost: 54173.71059377867
rewards -0.5338203044021502
turbulence 16.719999313354492
trade: 6997
cost: 54383.970244093
rewards -0.321086605791864
turbulence 16.790000915527344
trade: 7020
cost: 54459.84005567365
rewards 0.35657631744386165
turbulence 16.170000076293945
trade: 7044
cost: 54574.126117532796
rewards 0.03294070353813004
turbulence 15.59000015258789
trade: 7067
cost: 54617.421253477165
rewards 0.1283252591796918
turbulence 15.449999809265137
trade: 7090
cost: 54785.94512042053
rewards 0.6069090197875863
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turbulence 16.1200008392334
trade: 7114
cost: 54944.42415167052
rewards -0.4839026693744585
turbulence 17.90999984741211
trade: 7139
cost: 55240.67870491225
rewards -0.8372676253585843
turbulence 21.56999969482422
trade: 7162
cost: 55446.90842910964
rewards -0.14510051578369457
turbulence 21.670000076293945
trade: 7183
cost: 55634.80190786939
rewards 0.9468546948257601
turbulence 18.559999465942383
trade: 7206
cost: 55790.5910916615
rewards 0.26102137677574067
turbulence 17.149999618530273
trade: 7229
cost: 56044.8941619778
rewards -0.15602779428099747
turbulence 17.219999313354492
trade: 7255
cost: 56181.67395873074
rewards 0.7463152969703545
turbulence 16.790000915527344
trade: 7280
cost: 56421.63320979122
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turbulence 18.84000015258789
trade: 7304
cost: 56525.42591443829
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turbulence 16.389999389648438
trade: 7328
cost: 56732.14353537181
rewards -0.8007372840175405
turbulence 16.190000534057617
trade: 7354
cost: 56926.35438061336
rewards 0.5465041434459621
turbulence 16.479999542236328
trade: 7379
cost: 57185.428264452006
rewards -0.2496240443946794
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turbulence 16.110000610351562
trade: 7403
cost: 57397.052768304864
rewards 0.3188759469955461
turbulence 16.40999984741211
trade: 7426
cost: 57549.72500763897
rewards -0.3923645601104712
turbulence 16.40999984741211
trade: 7450
cost: 57708.91629737285
rewards -0.995586753021623
turbulence 18.13999938964844
trade: 7473
cost: 57901.24368934444
rewards -0.49495613618469797
turbulence 17.959999084472656
trade: 7499
cost: 58082.44133888058
rewards -0.5587706165302312
turbulence 18.799999237060547
trade: 7524
cost: 58324.79105124097
rewards -1.5195166993022897
turbulence 20.950000762939453
trade: 7547
cost: 58483.88796064574
rewards 1.0708126755569596
turbulence 19.3700008392334
trade: 7570
cost: 58696.933926939084
rewards -1.0611730941902149
turbulence 19.459999084472656
trade: 7594
cost: 58900.819112310484
rewards 1.368277808179101
turbulence 18.18000030517578
trade: 7615
cost: 59197.900855653854
rewards 0.21714688865127973
turbulence 18.690000534057617
trade: 7641
cost: 59446.43979308519
rewards -0.04294700438652654
turbulence 20.809999465942383
trade: 7665
cost: 59623.69740790377
rewards -2.129249875975796
```

turbulence 25.709999084472656
trade: 7693
cost: 59938.926804258444
rewards 0.10902230367355514
turbulence 24.36000061035156
trade: 7719
cost: 60195.748586401096
rewards 0.4992575822666055
turbulence 20.8700008392334
trade: 7743
cost: 60463.456840425606
rewards 2.3701222088851965
turbulence 18.6299991607666
trade: 7768
cost: 60720.45813261616
rewards 0.5314847714874196
turbulence 17.75
trade: 7794
cost: 61002.8941472951
rewards -0.25535273645706474
turbulence 18.76000022888184
trade: 7819
cost: 61262.20868609058
rewards -1.93446519465982
turbulence 23.25
trade: 7841
cost: 61464.76944235049
rewards 0.018651346102543175
turbulence 22.559999465942383
trade: 7864
cost: 61691.57598864947
rewards -2.446516151458747
turbulence 23.13999938964844
trade: 7889
cost: 61934.698101228816
rewards 1.7269836112949533
turbulence 21.100000381469727
trade: 7914
cost: 62201.16265890323
rewards -1.2204570818561595
turbulence 22.959999084472656
trade: 7940
cost: 62440.66188704119
rewards 1.204395086415112
turbulence 21.299999237060547
trade: 7965
cost: 62614.084363496884
rewards 0.20290326117551888

```
turbulence 21.0
trade: 7988
cost: 62703.95710528765
rewards 1.5274644168216736
turbulence 19.540000915527344
trade: 8013
cost: 63013.69628362856
rewards 0.09412029859886971
turbulence 18.770000457763672
trade: 8037
cost: 63231.41727072344
rewards -0.9429481218673755
turbulence 20.0
trade: 8065
cost: 63421.860456865405
rewards 0.2471395928207552
turbulence 19.850000381469727
trade: 8091
cost: 63648.81623230181
rewards -0.4839187316772528
turbulence 18.63999938964844
trade: 8116
cost: 63732.24265811358
rewards 2.9851916353839916
turbulence 16.860000610351562
trade: 8141
cost: 63979.72204859744
rewards 0.8263457696285332
turbulence 16.299999237060547
trade: 8168
cost: 64288.36154316913
rewards -0.44225243512419987
turbulence 16.309999465942383
trade: 8193
cost: 64620.832767122374
rewards 0.5517128657272319
turbulence 15.699999809265137
trade: 8217
cost: 64923.784763994314
rewards 1.2104423421226442
turbulence 15.489999771118164
trade: 8242
cost: 65204.48031173144
rewards 0.4058100495006656
turbulence 15.010000228881836
trade: 8268
cost: 65343.69190092287
rewards 1.8020220684997506
```

```
turbulence 15.43000030517578
trade: 8294
cost: 65569.84951182375
rewards -0.48980818946266086
turbulence 15.239999771118164
trade: 8323
cost: 65701.9906181813
rewards -0.025099738945020364
turbulence 15.979999542236328
trade: 8351
cost: 65942.9916201497
rewards -1.0817830405727262
turbulence 16.979999542236328
trade: 8377
cost: 66214.48316631897
rewards -1.0817830405727262
turbulence 16.979999542236328
trade: 8377
cost: 66214.48316631897
True
False
{}
```

[19]: 1326723.8536390278

```python
[20]: rewards_ddpg = list()
      turbulence_ddpg = list()
      cost_ddpg = list()
      trade_ddpg = list()

      obs = e_trade_gym.reset()[0]
      # print(obs[0])
      while True:
          action3, _states3 = trained_ddpg.predict(obs)
          obs, rewards, done, info, new = e_trade_gym.step(np.array(action3))
          print('rewards', rewards)
          rewards_ddpg.append(rewards)
          print('turbulence', e_trade_gym.turbulence)
          turbulence_ddpg.append(e_trade_gym.turbulence)
          print('trade:', e_trade_gym.trades)
          trade_ddpg.append(e_trade_gym.trades)
          print('cost:', e_trade_gym.cost)
          cost_ddpg.append(e_trade_gym.cost)
          if done:
              print(done)
              print(info)
              print(new)
```

```
        break
e_trade_gym.asset_memory[-1]
```

rewards 0.0216104364013765
turbulence 27.68000030517578
trade: 15
cost: 149.63393249511722
rewards 0.42794780208587185
turbulence 27.940000534057617
trade: 30
cost: 299.6336032867432
rewards -0.5114587761688163
turbulence 29.43000030517578
trade: 45
cost: 451.84801292419434
rewards 0.19105023368835683
turbulence 28.07999992370605
trade: 60
cost: 602.4082981109619
rewards -1.0534254261779832
turbulence 29.26000022888184
trade: 75
cost: 753.4838489532472
rewards 1.3570230973815895
turbulence 27.290000915527344
trade: 90
cost: 902.4827640533449
rewards 0.559637795849226
turbulence 32.189998626708984
trade: 105
cost: 998.9596715888979
rewards 2.2945699771808696
turbulence 29.520000457763672
trade: 121
cost: 999.000973388672
rewards 0.5734119544982911
turbulence 27.76000022888184
trade: 137
cost: 999.000973388672
rewards 0.11544240798950196
turbulence 28.0
trade: 153
cost: 999.000973388672
rewards -0.13819629821777343
turbulence 25.68000030517578
trade: 169
cost: 999.000973388672

```
rewards -0.5979841300964356
turbulence 24.459999084472656
trade: 185
cost: 999.000973388672
rewards 1.061859892654419
turbulence 24.84000015258789
trade: 201
cost: 999.000973388672
rewards 0.7522128177642823
turbulence 24.31999969482422
trade: 217
cost: 999.000973388672
rewards -0.5442342483520508
turbulence 26.07999992370605
trade: 233
cost: 999.000973388672
rewards -1.0369987907409668
turbulence 25.84000015258789
trade: 249
cost: 999.000973388672
rewards -0.015762969207763673
turbulence 24.739999771118164
trade: 265
cost: 999.000973388672
rewards -0.6180873481750488
turbulence 25.440000534057617
trade: 281
cost: 999.000973388672
rewards 0.8028694995880127
turbulence 24.100000381469727
trade: 297
cost: 999.000973388672
rewards -1.1521231521606445
turbulence 24.76000022888184
trade: 313
cost: 999.000973388672
rewards -0.7238177627563477
turbulence 24.459999084472656
trade: 329
cost: 999.000973388672
rewards 0.13229970703125002
turbulence 24.280000686645508
trade: 345
cost: 999.000973388672
rewards 0.7915122753143311
turbulence 23.76000022888184
trade: 361
cost: 999.000973388672
```

```
rewards 1.6000844154357912
turbulence 22.989999771118164
trade: 377
cost: 999.000973388672
rewards 0.5706018112182617
turbulence 22.649999618530277
trade: 393
cost: 999.000973388672
rewards 0.7083585491180421
turbulence 22.209999084472656
trade: 409
cost: 999.000973388672
rewards 1.3125604873657226
turbulence 22.1299991607666
trade: 425
cost: 999.000973388672
rewards -0.06428254051208497
turbulence 24.030000686645508
trade: 441
cost: 999.000973388672
rewards 0.8722352020263673
turbulence 22.280000686645508
trade: 457
cost: 999.000973388672
rewards -0.9802278240203858
turbulence 22.1299991607666
trade: 473
cost: 999.000973388672
rewards 0.27178347358703614
turbulence 22.049999237060547
trade: 489
cost: 999.000973388672
rewards -0.47923070869445805
turbulence 21.350000381469727
trade: 505
cost: 999.000973388672
rewards -0.38954150581359864
turbulence 21.51000022888184
trade: 521
cost: 999.000973388672
rewards -0.6066559852600097
turbulence 22.540000915527344
trade: 537
cost: 999.000973388672
rewards -0.350324390411377
turbulence 22.71999931335449
trade: 553
cost: 999.000973388672
```

```
rewards 0.2695333415985108
turbulence 22.540000915527344
trade: 569
cost: 999.000973388672
rewards 0.9422831356048584
turbulence 22.3700008392334
trade: 585
cost: 999.000973388672
rewards -0.09200239448547363
turbulence 22.030000686645508
trade: 601
cost: 999.000973388672
rewards -0.15260541572570802
turbulence 23.270000457763672
trade: 617
cost: 999.000973388672
rewards 1.2157173282623293
turbulence 24.46999931335449
trade: 633
cost: 999.000973388672
rewards 1.0193425064086914
turbulence 22.959999084472656
trade: 649
cost: 999.000973388672
rewards -1.0318409564971924
turbulence 26.40999984741211
trade: 665
cost: 999.000973388672
rewards 0.677900256729126
turbulence 26.1200008392334
trade: 681
cost: 999.000973388672
rewards 1.9691881855010986
turbulence 26.56999969482422
trade: 697
cost: 999.000973388672
rewards -1.7026166667938234
turbulence 33.599998474121094
trade: 713
cost: 999.000973388672
rewards -0.46249436149597173
turbulence 30.75
trade: 729
cost: 999.000973388672
rewards -1.2575315105438234
turbulence 31.459999084472656
trade: 745
cost: 999.000973388672
```

```
rewards 1.0862837261199951
turbulence 28.809999465942383
trade: 761
cost: 999.000973388672
rewards -1.4195505836486817
turbulence 29.709999084472656
trade: 777
cost: 999.000973388672
rewards 0.40462540283203124
turbulence 26.8700008392334
trade: 793
cost: 999.000973388672
rewards 1.034806521987915
turbulence 25.850000381469727
trade: 809
cost: 999.000973388672
rewards -0.44574758300781253
turbulence 25.59000015258789
trade: 825
cost: 999.000973388672
rewards 0.4804625301361084
turbulence 26.040000915527344
trade: 841
cost: 999.000973388672
rewards -0.2731175029754639
turbulence 26.459999084472656
trade: 857
cost: 999.000973388672
rewards -0.4876609748840332
turbulence 25.82999992370605
trade: 873
cost: 999.000973388672
rewards -2.6155429767608642
turbulence 27.780000686645508
trade: 889
cost: 999.000973388672
rewards -0.013744639205932618
turbulence 26.86000061035156
trade: 905
cost: 999.000973388672
rewards -1.732066379928589
turbulence 28.57999992370605
trade: 921
cost: 999.000973388672
rewards 0.12503953285217287
turbulence 28.51000022888184
trade: 937
cost: 999.000973388672
```

```
rewards 1.221804578781128
turbulence 26.3799991607666
trade: 953
cost: 999.000973388672
rewards 1.3492752967834474
turbulence 26.190000534057617
trade: 969
cost: 999.000973388672
rewards -0.49097179183959966
turbulence 26.270000457763672
trade: 985
cost: 999.000973388672
rewards 1.2137463825225832
turbulence 26.3700008392334
trade: 1001
cost: 999.000973388672
rewards -0.033243522262573245
turbulence 26.700000762939453
trade: 1017
cost: 999.000973388672
rewards 0.007807342910766602
turbulence 27.6299991607666
trade: 1033
cost: 999.000973388672
rewards 1.6472663215637209
turbulence 27.959999084472656
trade: 1049
cost: 999.000973388672
rewards -1.1604213638305665
turbulence 29.479999542236328
trade: 1065
cost: 999.000973388672
rewards 1.7557039554595948
turbulence 28.059999465942383
trade: 1081
cost: 999.000973388672
rewards 1.1811652976989746
turbulence 26.36000061035156
trade: 1097
cost: 999.000973388672
rewards 0.4109360546112061
turbulence 25.0
trade: 1113
cost: 999.000973388672
rewards 0.8494519203186035
turbulence 25.06999969482422
trade: 1129
cost: 999.000973388672
```

```
rewards -0.23688073081970215
turbulence 26.06999969482422
trade: 1145
cost: 999.000973388672
rewards -0.8876757850646974
turbulence 26.399999618530277
trade: 1161
cost: 999.000973388672
rewards 0.5546516052246094
turbulence 26.96999931335449
trade: 1177
cost: 999.000973388672
rewards 0.6211546985626221
turbulence 27.40999984741211
trade: 1193
cost: 999.000973388672
rewards -1.64819909324646
turbulence 29.18000030517578
trade: 1209
cost: 999.000973388672
rewards -0.11450026969909669
turbulence 29.350000381469727
trade: 1225
cost: 999.000973388672
rewards -0.40219498977661133
turbulence 28.649999618530277
trade: 1241
cost: 999.000973388672
rewards 1.1936728256225586
turbulence 28.11000061035156
trade: 1257
cost: 999.000973388672
rewards -0.20495051727294922
turbulence 27.549999237060547
trade: 1273
cost: 999.000973388672
rewards -2.568186939239502
turbulence 32.459999084472656
trade: 1289
cost: 999.000973388672
rewards -1.2743825473785402
turbulence 33.349998474121094
trade: 1305
cost: 999.000973388672
rewards -3.680832074737549
turbulence 40.27999877929688
trade: 1321
cost: 999.000973388672
```

```
rewards 0.3368521259307862
turbulence 37.59000015258789
trade: 1337
cost: 999.000973388672
rewards 0.3679484973907471
turbulence 38.02000045776367
trade: 1353
cost: 999.000973388672
rewards 1.6318857078552247
turbulence 37.130001068115234
trade: 1369
cost: 999.000973388672
rewards 2.1525533699035644
turbulence 35.54999923706055
trade: 1385
cost: 999.000973388672
rewards 0.6788665992736816
turbulence 29.56999969482422
trade: 1401
cost: 999.000973388672
rewards 1.61824149017334
turbulence 27.57999992370605
trade: 1417
cost: 999.000973388672
rewards -0.4448894828796387
turbulence 24.86000061035156
trade: 1433
cost: 999.000973388672
rewards 5.1996042407989504
turbulence 25.75
trade: 1449
cost: 999.000973388672
rewards 1.1335109844207765
turbulence 24.799999237060547
trade: 1465
cost: 999.000973388672
rewards -0.7120485446929932
turbulence 23.450000762939453
trade: 1481
cost: 999.000973388672
rewards -0.8396405830383301
turbulence 25.350000381469727
trade: 1497
cost: 999.000973388672
rewards 1.6671763427734376
turbulence 23.100000381469727
trade: 1513
cost: 999.000973388672
```

```
rewards 2.118149436569214
turbulence 22.450000762939453
trade: 1529
cost: 999.000973388672
rewards -1.3718554908752443
turbulence 22.709999084472656
trade: 1545
cost: 999.000973388672
rewards -1.256247758102417
turbulence 23.84000015258789
trade: 1561
cost: 999.000973388672
rewards -0.25206185111999513
turbulence 23.11000061035156
trade: 1577
cost: 999.000973388672
rewards -0.7194664859771729
turbulence 23.700000762939453
trade: 1593
cost: 999.000973388672
rewards 1.7379722736358643
turbulence 22.65999984741211
trade: 1609
cost: 999.000973388672
rewards 2.1583389686584473
turbulence 21.63999938964844
trade: 1625
cost: 999.000973388672
rewards -0.7840320045471192
turbulence 21.25
trade: 1641
cost: 999.000973388672
rewards 0.04787564926147461
turbulence 20.84000015258789
trade: 1657
cost: 999.000973388672
rewards -0.6786439590454102
turbulence 20.56999969482422
trade: 1673
cost: 999.000973388672
rewards 0.8297339538574219
turbulence 20.770000457763672
trade: 1689
cost: 999.000973388672
rewards 1.0236111671447754
turbulence 21.170000076293945
trade: 1705
cost: 999.000973388672
```

```
rewards 0.36674008102416994
turbulence 21.280000686645508
trade: 1721
cost: 999.000973388672
rewards 1.5207538902282716
turbulence 20.790000915527344
trade: 1737
cost: 999.000973388672
rewards -1.2712310676574707
turbulence 21.299999237060547
trade: 1753
cost: 999.000973388672
rewards 0.342936243057251
turbulence 20.68000030517578
trade: 1769
cost: 999.000973388672
rewards -0.24810520210266115
turbulence 22.270000457763672
trade: 1785
cost: 999.000973388672
rewards -0.5263623371124267
turbulence 22.520000457763672
trade: 1801
cost: 999.000973388672
rewards 1.094780791091919
turbulence 23.309999465942383
trade: 1817
cost: 999.000973388672
rewards -1.1725393432617188
turbulence 24.71999931335449
trade: 1833
cost: 999.000973388672
rewards 1.5142516780853272
turbulence 22.88999938964844
trade: 1849
cost: 999.000973388672
rewards -0.508839688873291
turbulence 22.5
trade: 1865
cost: 999.000973388672
rewards 0.397320601272583
turbulence 21.93000030517578
trade: 1881
cost: 999.000973388672
rewards -0.3458589740753174
turbulence 21.56999969482422
trade: 1897
cost: 999.000973388672
```

```
rewards -0.8409620307922364
turbulence 25.15999984741211
trade: 1913
cost: 999.000973388672
rewards -0.9205783210754395
turbulence 24.229999542236328
trade: 1929
cost: 999.000973388672
rewards 0.923874188232422
turbulence 23.309999465942383
trade: 1945
cost: 999.000973388672
rewards 0.34866134986877445
turbulence 21.530000686645508
trade: 1961
cost: 999.000973388672
rewards 1.0720898494720459
turbulence 21.700000762939453
trade: 1977
cost: 999.000973388672
rewards -0.22759140815734866
turbulence 23.07999992370605
trade: 1993
cost: 999.000973388672
rewards 0.5188915119171142
turbulence 22.770000457763672
trade: 2009
cost: 999.000973388672
rewards 1.1360614643096925
turbulence 22.75
trade: 2025
cost: 999.000973388672
rewards -0.8901636299133301
turbulence 26.96999931335449
trade: 2041
cost: 999.000973388672
rewards 0.36616164894104003
turbulence 25.34000015258789
trade: 2057
cost: 999.000973388672
rewards 2.8304112651824953
turbulence 25.06999969482422
trade: 2073
cost: 999.000973388672
rewards 0.834016605758667
turbulence 22.3700008392334
trade: 2089
cost: 999.000973388672
```

```
rewards 0.1614465431213379
turbulence 21.559999465942383
trade: 2105
cost: 999.000973388672
rewards -0.03221848220825196
turbulence 24.07999992370605
trade: 2121
cost: 999.000973388672
rewards 0.17839031829833984
turbulence 23.32999992370605
trade: 2137
cost: 999.000973388672
rewards -0.13820629501342774
turbulence 22.209999084472656
trade: 2153
cost: 999.000973388672
rewards 0.08812985382080078
turbulence 23.25
trade: 2169
cost: 999.000973388672
rewards -1.0282972480773926
turbulence 24.34000015258789
trade: 2185
cost: 999.000973388672
rewards 0.5581115577697754
turbulence 23.239999771118164
trade: 2201
cost: 999.000973388672
rewards 0.48091808090209964
turbulence 21.57999992370605
trade: 2217
cost: 999.000973388672
rewards -0.13530640678405761
turbulence 21.31999969482422
trade: 2233
cost: 999.000973388672
rewards -1.4666873462677004
turbulence 21.90999984741211
trade: 2249
cost: 999.000973388672
rewards -0.6838271892547608
turbulence 23.190000534057617
trade: 2265
cost: 999.000973388672
rewards -0.18273433074951173
turbulence 23.020000457763672
trade: 2281
cost: 999.000973388672
```

```
rewards -2.897142381286621
turbulence 37.209999084472656
trade: 2297
cost: 999.000973388672
rewards 1.775303519821167
turbulence 30.209999084472656
trade: 2313
cost: 999.000973388672
rewards -1.9410639236450196
turbulence 33.09000015258789
trade: 2329
cost: 999.000973388672
rewards 0.5542845233917236
turbulence 30.239999771118164
trade: 2345
cost: 999.000973388672
rewards 1.9393027393341065
turbulence 25.559999465942383
trade: 2361
cost: 999.000973388672
rewards -0.04340366706848145
turbulence 22.90999984741211
trade: 2377
cost: 999.000973388672
rewards 0.9618469802856445
turbulence 21.770000457763672
trade: 2393
cost: 999.000973388672
rewards 0.47496214141845705
turbulence 20.8700008392334
trade: 2409
cost: 999.000973388672
rewards 1.5534549137115479
turbulence 21.239999771118164
trade: 2425
cost: 999.000973388672
rewards 0.34062052154541017
turbulence 21.6299991607666
trade: 2441
cost: 999.000973388672
rewards 0.40680801544189454
turbulence 21.989999771118164
trade: 2457
cost: 999.000973388672
rewards -0.005506676483154297
turbulence 21.25
trade: 2473
cost: 999.000973388672
```

```
rewards -0.16874158172607423
turbulence 19.96999931335449
trade: 2489
cost: 999.000973388672
rewards 0.2938448280334473
turbulence 21.459999084472656
trade: 2505
cost: 999.000973388672
rewards 0.34591141967773437
turbulence 21.5
trade: 2521
cost: 999.000973388672
rewards -0.7966171157836914
turbulence 22.489999771118164
trade: 2537
cost: 999.000973388672
rewards 0.47739038238525394
turbulence 22.049999237060547
trade: 2553
cost: 999.000973388672
rewards 1.7474368907928468
turbulence 23.450000762939453
trade: 2569
cost: 999.000973388672
rewards 0.585403052520752
turbulence 23.11000061035156
trade: 2585
cost: 999.000973388672
rewards 1.3970369037628174
turbulence 21.34000015258789
trade: 2601
cost: 999.000973388672
rewards -1.648686915588379
turbulence 28.88999938964844
trade: 2617
cost: 999.000973388672
rewards -1.8629359493255615
turbulence 27.950000762939453
trade: 2633
cost: 999.000973388672
rewards 2.035145874404907
turbulence 23.350000381469727
trade: 2649
cost: 999.000973388672
rewards -0.5734782623291016
turbulence 24.100000381469727
trade: 2665
cost: 999.000973388672
```

```
rewards -0.26530259666442874
turbulence 26.670000076293945
trade: 2681
cost: 999.000973388672
rewards -1.0824743198394775
turbulence 28.56999969482422
trade: 2697
cost: 999.000973388672
rewards 3.027413109588623
turbulence 24.65999984741211
trade: 2713
cost: 999.000973388672
rewards 1.8989760326385499
turbulence 25.46999931335449
trade: 2729
cost: 999.000973388672
rewards -1.025597622680664
turbulence 24.030000686645508
trade: 2745
cost: 999.000973388672
rewards 1.6408317165374757
turbulence 22.559999465942383
trade: 2761
cost: 999.000973388672
rewards 0.13716035079956054
turbulence 21.90999984741211
trade: 2777
cost: 999.000973388672
rewards 1.3941163661956788
turbulence 20.690000534057617
trade: 2793
cost: 999.000973388672
rewards 0.5046354564666748
turbulence 20.030000686645508
trade: 2809
cost: 999.000973388672
rewards -0.8807648571014405
turbulence 19.790000915527344
trade: 2825
cost: 999.000973388672
rewards 0.8214384349822998
turbulence 19.229999542236328
trade: 2841
cost: 999.000973388672
rewards -0.4687416770935059
turbulence 21.57999992370605
trade: 2857
cost: 999.000973388672
```

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rewards -0.5589519920349121
turbulence 20.950000762939453
trade: 2873
cost: 999.000973388672
rewards 0.4586887462615967
turbulence 18.8799991607666
trade: 2889
cost: 999.000973388672
rewards -1.2378840099334718
turbulence 20.299999237060547
trade: 2905
cost: 999.000973388672
rewards 0.3606320095062256
turbulence 21.200000762939453
trade: 2921
cost: 999.000973388672
rewards 1.1137808612823488
turbulence 19.809999465942383
trade: 2937
cost: 999.000973388672
rewards 1.970074348831177
turbulence 18.86000061035156
trade: 2953
cost: 999.000973388672
rewards 0.2133228313446045
turbulence 20.739999771118164
trade: 2969
cost: 999.000973388672
rewards -0.42809803924560547
turbulence 19.61000061035156
trade: 2985
cost: 999.000973388672
rewards -0.658018962097168
turbulence 19.399999618530277
trade: 3001
cost: 999.000973388672
rewards 0.4374594230651856
turbulence 17.329999923706055
trade: 3017
cost: 999.000973388672
rewards 1.30831672706604
turbulence 17.90999984741211
trade: 3033
cost: 999.000973388672
rewards -0.5823703914642334
turbulence 18.1200008392334
trade: 3049
cost: 999.000973388672
```

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rewards 0.2647106479644776
turbulence 17.15999984741211
trade: 3065
cost: 999.000973388672
rewards -0.33250475845336913
turbulence 16.950000762939453
trade: 3081
cost: 999.000973388672
rewards 0.895851746749878
turbulence 16.690000534057617
trade: 3097
cost: 999.000973388672
rewards -0.43930538291931154
turbulence 16.90999984741211
trade: 3113
cost: 999.000973388672
rewards -0.8494765182495118
turbulence 16.649999618530273
trade: 3129
cost: 999.000973388672
rewards 0.41699428062438965
turbulence 16.989999771118164
trade: 3145
cost: 999.000973388672
rewards 0.9897287261962892
turbulence 16.56999969482422
trade: 3161
cost: 999.000973388672
rewards 0.7456907306671143
turbulence 16.25
trade: 3177
cost: 999.000973388672
rewards -0.38769658203125
turbulence 17.290000915527344
trade: 3193
cost: 999.000973388672
rewards -0.29922679672241215
turbulence 18.68000030517578
trade: 3209
cost: 999.000973388672
rewards 1.2336343349456789
turbulence 17.5
trade: 3225
cost: 999.000973388672
rewards -1.250320662689209
turbulence 18.709999084472656
trade: 3241
cost: 999.000973388672
```

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rewards 0.4569341751098633
turbulence 17.329999923706055
trade: 3257
cost: 999.000973388672
rewards -0.25104387550354007
turbulence 17.639999389648438
trade: 3273
cost: 999.000973388672
rewards 0.08439236526489258
turbulence 17.559999465942383
trade: 3289
cost: 999.000973388672
rewards 0.18454412536621095
turbulence 17.280000686645508
trade: 3305
cost: 999.000973388672
rewards 1.3284425685882568
turbulence 17.610000610351562
trade: 3321
cost: 999.000973388672
rewards -0.7077903297424317
turbulence 18.61000061035156
trade: 3337
cost: 999.000973388672
rewards 1.1639583786010743
turbulence 18.309999465942383
trade: 3353
cost: 999.000973388672
rewards 0.7117199859619141
turbulence 19.479999542236328
trade: 3369
cost: 999.000973388672
rewards 0.6401306903839111
turbulence 19.149999618530277
trade: 3385
cost: 999.000973388672
rewards 0.840308215713501
turbulence 18.38999938964844
trade: 3401
cost: 999.000973388672
rewards 0.8508082923889161
turbulence 16.690000534057617
trade: 3417
cost: 999.000973388672
rewards 0.509206156539917
turbulence 19.65999984741211
trade: 3433
cost: 999.000973388672
```

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rewards -2.2877899559020998
turbulence 21.84000015258789
trade: 3449
cost: 999.000973388672
rewards -2.0138595893859863
turbulence 27.59000015258789
trade: 3465
cost: 999.000973388672
rewards 1.4920285202026369
turbulence 23.1299991607666
trade: 3481
cost: 999.000973388672
rewards 0.8436446479797364
turbulence 18.809999465942383
trade: 3497
cost: 999.000973388672
rewards -0.058642020416259766
turbulence 19.71999931335449
trade: 3513
cost: 999.000973388672
rewards -0.7156405582427979
turbulence 21.34000015258789
trade: 3529
cost: 999.000973388672
rewards -0.7594448104858399
turbulence 22.18000030517578
trade: 3545
cost: 999.000973388672
rewards 0.38695990562438964
turbulence 20.670000076293945
trade: 3561
cost: 999.000973388672
rewards 0.5924373489379883
turbulence 20.149999618530277
trade: 3577
cost: 999.000973388672
rewards 0.698764193725586
turbulence 18.399999618530277
trade: 3593
cost: 999.000973388672
rewards -0.24873887367248537
turbulence 18.84000015258789
trade: 3609
cost: 999.000973388672
rewards -0.11784813385009767
turbulence 17.360000610351562
trade: 3625
cost: 999.000973388672
```

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rewards 0.8265266395568848
turbulence 16.739999771118164
trade: 3641
cost: 999.000973388672
rewards -0.019890934371948242
turbulence 16.760000228881836
trade: 3657
cost: 999.000973388672
rewards 0.07427483024597169
turbulence 17.899999618530273
trade: 3673
cost: 999.000973388672
rewards 0.2792417697906494
turbulence 17.479999542236328
trade: 3689
cost: 999.000973388672
rewards 0.04724333534240723
turbulence 18.040000915527344
trade: 3705
cost: 999.000973388672
rewards 0.40957274627685547
turbulence 16.420000076293945
trade: 3721
cost: 999.000973388672
rewards -0.9050781558990479
turbulence 16.420000076293945
trade: 3737
cost: 999.000973388672
rewards 0.0254480281829834
turbulence 17.06999969482422
trade: 3753
cost: 999.000973388672
rewards -0.7285930377960206
turbulence 17.889999389648438
trade: 3769
cost: 999.000973388672
rewards -0.2163003288269043
turbulence 16.100000381469727
trade: 3785
cost: 999.000973388672
rewards -0.23821943931579592
turbulence 15.649999618530272
trade: 3801
cost: 999.000973388672
rewards -0.3568597812652588
turbulence 16.389999389648438
trade: 3817
cost: 999.000973388672
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rewards -0.13002444152832032
turbulence 17.020000457763672
trade: 3833
cost: 999.000973388672
rewards -1.035619647216797
turbulence 18.149999618530277
trade: 3849
cost: 999.000973388672
rewards -1.3312481945037842
turbulence 17.75
trade: 3865
cost: 999.000973388672
rewards -2.5326077003479006
turbulence 20.700000762939453
trade: 3881
cost: 999.000973388672
rewards 2.5453296268463137
turbulence 17.889999389648438
trade: 3897
cost: 999.000973388672
rewards 0.053769500350952154
turbulence 16.65999984741211
trade: 3913
cost: 999.000973388672
rewards -0.229998397064209
turbulence 16.31999969482422
trade: 3929
cost: 999.000973388672
rewards 1.2956917320251466
turbulence 15.970000267028809
trade: 3945
cost: 999.000973388672
rewards 0.5796588958740234
turbulence 15.619999885559082
trade: 3961
cost: 999.000973388672
rewards -0.9684583171844483
turbulence 15.760000228881836
trade: 3977
cost: 999.000973388672
rewards -0.7104692108154297
turbulence 16.020000457763672
trade: 3993
cost: 999.000973388672
rewards 1.0809488861083985
turbulence 15.829999923706056
trade: 4009
cost: 999.000973388672
```

```
rewards 0.47394842262268067
turbulence 15.479999542236328
trade: 4025
cost: 999.000973388672
rewards 0.38880520439147953
turbulence 15.06999969482422
trade: 4041
cost: 999.000973388672
rewards -1.0343719207763673
turbulence 16.440000534057617
trade: 4057
cost: 999.000973388672
rewards 0.4169725440979004
turbulence 16.200000762939453
trade: 4073
cost: 999.000973388672
rewards -0.8928154308319092
turbulence 19.0
trade: 4089
cost: 999.000973388672
rewards 1.9489887104034425
turbulence 16.18000030517578
trade: 4105
cost: 999.000973388672
rewards 1.0495568832397462
turbulence 16.170000076293945
trade: 4121
cost: 999.000973388672
rewards -0.32583213958740237
turbulence 17.1200008392334
trade: 4137
cost: 999.000973388672
rewards -0.3820505149841309
turbulence 16.329999923706055
trade: 4153
cost: 999.000973388672
rewards 0.15950638427734376
turbulence 17.010000228881836
trade: 4169
cost: 999.000973388672
rewards -1.5016639713287354
turbulence 18.450000762939453
trade: 4185
cost: 999.000973388672
rewards -2.9473908325195315
turbulence 22.5
trade: 4201
cost: 999.000973388672
```

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rewards 2.1002963611602783
turbulence 19.729999542236328
trade: 4217
cost: 999.000973388672
rewards 1.3426419116973878
turbulence 17.90999984741211
trade: 4233
cost: 999.000973388672
rewards -0.2948501636505127
turbulence 17.690000534057617
trade: 4249
cost: 999.000973388672
rewards 0.7103121860504151
turbulence 17.200000762939453
trade: 4265
cost: 999.000973388672
rewards 0.5082606655120849
turbulence 17.579999923706055
trade: 4281
cost: 999.000973388672
rewards 0.16388694801330567
turbulence 19.36000061035156
trade: 4297
cost: 999.000973388672
rewards -0.8903146884918214
turbulence 18.309999465942383
trade: 4313
cost: 999.000973388672
rewards 0.7401075832366943
turbulence 17.700000762939453
trade: 4329
cost: 999.000973388672
rewards -0.8654241626739503
turbulence 18.239999771118164
trade: 4345
cost: 999.000973388672
rewards -0.2500719722747803
turbulence 19.459999084472656
trade: 4361
cost: 999.000973388672
rewards 0.9132665664672852
turbulence 18.040000915527344
trade: 4377
cost: 999.000973388672
rewards -1.1508882236480713
turbulence 17.969999313354492
trade: 4393
cost: 999.000973388672
```

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rewards 0.5219527496337891
turbulence 17.280000686645508
trade: 4409
cost: 999.000973388672
rewards 0.8100701026916505
turbulence 16.149999618530273
trade: 4425
cost: 999.000973388672
rewards -0.4852972137451172
turbulence 16.719999313354492
trade: 4441
cost: 999.000973388672
rewards 0.8251821979522705
turbulence 16.790000915527344
trade: 4457
cost: 999.000973388672
rewards 0.9676282554626465
turbulence 16.170000076293945
trade: 4473
cost: 999.000973388672
rewards -0.0700483657836914
turbulence 15.59000015258789
trade: 4489
cost: 999.000973388672
rewards 0.16672743186950684
turbulence 15.449999809265137
trade: 4505
cost: 999.000973388672
rewards 0.4149990917205811
turbulence 16.1200008392334
trade: 4521
cost: 999.000973388672
rewards -0.5443273788452149
turbulence 17.90999984741211
trade: 4537
cost: 999.000973388672
rewards -1.7642102481842041
turbulence 21.56999969482422
trade: 4553
cost: 999.000973388672
rewards -0.16973329277038576
turbulence 21.670000076293945
trade: 4569
cost: 999.000973388672
rewards 0.7081208164215088
turbulence 18.559999465942383
trade: 4585
cost: 999.000973388672
```

```
rewards 0.618748994064331
turbulence 17.149999618530273
trade: 4601
cost: 999.000973388672
rewards 0.08684727439880371
turbulence 17.219999313354492
trade: 4617
cost: 999.000973388672
rewards 0.4937660068511963
turbulence 16.790000915527344
trade: 4633
cost: 999.000973388672
rewards -1.1015715717315675
turbulence 18.84000015258789
trade: 4649
cost: 999.000973388672
rewards 0.9445831520080566
turbulence 16.389999389648438
trade: 4665
cost: 999.000973388672
rewards -0.514966537475586
turbulence 16.190000534057617
trade: 4681
cost: 999.000973388672
rewards 0.27049918060302736
turbulence 16.479999542236328
trade: 4697
cost: 999.000973388672
rewards -0.20487592391967774
turbulence 16.110000610351562
trade: 4713
cost: 999.000973388672
rewards 0.9545502689361572
turbulence 16.40999984741211
trade: 4729
cost: 999.000973388672
rewards -0.5508730747222901
turbulence 16.40999984741211
trade: 4745
cost: 999.000973388672
rewards -0.7194526092529298
turbulence 18.13999938964844
trade: 4761
cost: 999.000973388672
rewards -0.321722038269043
turbulence 17.959999084472656
trade: 4777
cost: 999.000973388672
```

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rewards -0.5156066730499268
turbulence 18.799999237060547
trade: 4793
cost: 999.000973388672
rewards -1.0859404304504394
turbulence 20.950000762939453
trade: 4809
cost: 999.000973388672
rewards 1.4150890129089355
turbulence 19.3700008392334
trade: 4825
cost: 999.000973388672
rewards -1.3409539947509765
turbulence 19.459999084472656
trade: 4841
cost: 999.000973388672
rewards 1.258803673553467
turbulence 18.18000030517578
trade: 4857
cost: 999.000973388672
rewards -0.22016895141601564
turbulence 18.690000534057617
trade: 4873
cost: 999.000973388672
rewards -0.3519001865386963
turbulence 20.809999465942383
trade: 4889
cost: 999.000973388672
rewards -2.741282270050049
turbulence 25.709999084472656
trade: 4905
cost: 999.000973388672
rewards -0.43865469665527346
turbulence 24.36000061035156
trade: 4921
cost: 999.000973388672
rewards 0.9806957389831543
turbulence 20.8700008392334
trade: 4937
cost: 999.000973388672
rewards 1.8413811519622805
turbulence 18.6299991607666
trade: 4953
cost: 999.000973388672
rewards 0.38823156509399415
turbulence 17.75
trade: 4969
cost: 999.000973388672
```

```
rewards 0.7885018711090088
turbulence 18.76000022888184
trade: 4985
cost: 999.000973388672
rewards -1.5698120346069337
turbulence 23.25
trade: 5001
cost: 999.000973388672
rewards -0.08142990112304688
turbulence 22.559999465942383
trade: 5017
cost: 999.000973388672
rewards -2.4219712474823
turbulence 23.13999938964844
trade: 5033
cost: 999.000973388672
rewards 1.8563023254394533
turbulence 21.100000381469727
trade: 5049
cost: 999.000973388672
rewards -0.8219468994140625
turbulence 22.959999084472656
trade: 5065
cost: 999.000973388672
rewards 1.053921155166626
turbulence 21.299999237060547
trade: 5081
cost: 999.000973388672
rewards 0.0699571704864502
turbulence 21.0
trade: 5097
cost: 999.000973388672
rewards 1.6324630977630616
turbulence 19.540000915527344
trade: 5113
cost: 999.000973388672
rewards 0.31672108039855956
turbulence 18.770000457763672
trade: 5129
cost: 999.000973388672
rewards -1.239889266204834
turbulence 20.0
trade: 5145
cost: 999.000973388672
rewards -0.8953738445281982
turbulence 19.850000381469727
trade: 5161
cost: 999.000973388672
```

```
rewards -0.7739506080627442
turbulence 18.63999938964844
trade: 5177
cost: 999.000973388672
rewards 2.7504489616394046
turbulence 16.860000610351562
trade: 5193
cost: 999.000973388672
rewards 1.4298528953552248
turbulence 16.299999237060547
trade: 5209
cost: 999.000973388672
rewards -0.7967802085876465
turbulence 16.309999465942383
trade: 5225
cost: 999.000973388672
rewards 1.0416598781585693
turbulence 15.699999809265137
trade: 5241
cost: 999.000973388672
rewards 1.2575170715332031
turbulence 15.489999771118164
trade: 5257
cost: 999.000973388672
rewards -0.6578684928894043
turbulence 15.010000228881836
trade: 5273
cost: 999.000973388672
rewards 0.5520211185455323
turbulence 15.43000030517578
trade: 5289
cost: 999.000973388672
rewards 0.03243319549560547
turbulence 15.239999771118164
trade: 5305
cost: 999.000973388672
rewards -0.027066134643554687
turbulence 15.979999542236328
trade: 5321
cost: 999.000973388672
rewards -1.0423816188812256
turbulence 16.979999542236328
trade: 5337
cost: 999.000973388672
rewards -1.0423816188812256
turbulence 16.979999542236328
trade: 5337
cost: 999.000973388672
```

```
True
False
{}
```

[20]: `1405916.649207428`

[21]:
```python
rewards_sac = list()
turbulence_sac = list()
cost_sac = list()
trade_sac = list()

obs = e_trade_gym.reset()[0]
# print(obs[0])
while True:
    action4, _states4 = trained_sac.predict(obs)
    obs, rewards, done, info, new = e_trade_gym.step(np.array(action4))
    print('rewards', rewards)
    rewards_sac.append(rewards)
    print('turbulence', e_trade_gym.turbulence)
    turbulence_sac.append(e_trade_gym.turbulence)
    print('trade:', e_trade_gym.trades)
    trade_sac.append(e_trade_gym.trades)
    print('cost:', e_trade_gym.cost)
    cost_sac.append(e_trade_gym.cost)
    if done:
        print(done)
        print(info)
        print(new)
        break
e_trade_gym.asset_memory[-1]
```

```
rewards 0.04846187303888146
turbulence 27.68000030517578
trade: 16
cost: 145.97961632156373
rewards 0.48059204369164077
turbulence 27.940000534057617
trade: 32
cost: 288.6395054855347
rewards -0.8087251656555222
turbulence 29.43000030517578
trade: 48
cost: 455.2330809860229
rewards 0.49432669724921
turbulence 28.07999992370605
trade: 64
cost: 607.1487104225158
rewards -0.7689211666877731
```

```
turbulence 29.26000022888184
trade: 79
cost: 767.3883848075867
rewards 0.8487582381069195
turbulence 27.290000915527344
trade: 94
cost: 927.0180589447019
rewards -0.894909391255572
turbulence 32.189998626708984
trade: 109
cost: 1052.2359415321348
rewards 1.8731312499267632
turbulence 29.520000457763672
trade: 124
cost: 1066.6482652626037
rewards 0.9754483826953918
turbulence 27.76000022888184
trade: 139
cost: 1067.7326336517335
rewards -1.0180598529205425
turbulence 28.0
trade: 154
cost: 1068.0934423675537
rewards -0.13581625402411446
turbulence 25.68000030517578
trade: 169
cost: 1110.8551952552796
rewards 0.8645232859306271
turbulence 24.459999084472656
trade: 184
cost: 1123.4696641349792
rewards 0.27505476116409994
turbulence 24.84000015258789
trade: 200
cost: 1130.4107991371154
rewards 0.9371474745124811
turbulence 24.31999969482422
trade: 218
cost: 1138.994853755951
rewards -1.9146830650329592
turbulence 26.07999992370605
trade: 234
cost: 1138.994853755951
rewards -0.47011461131897525
turbulence 25.84000015258789
trade: 250
cost: 1154.5089784202576
rewards 0.4968988562725135
```

```
turbulence 24.739999771118164
trade: 266
cost: 1168.5794633941653
rewards -0.8001579846778885
turbulence 25.440000534057617
trade: 281
cost: 1197.626885246277
rewards 0.17853875461425633
turbulence 24.100000381469727
trade: 296
cost: 1205.0495388412478
rewards -0.9321617395690992
turbulence 24.76000022888184
trade: 310
cost: 1208.5986743392946
rewards 0.23521788635253907
turbulence 24.459999084472656
trade: 326
cost: 1208.5986743392946
rewards 1.7590521657196108
turbulence 24.280000686645508
trade: 342
cost: 1218.2632354049686
rewards -0.027989810532378034
turbulence 23.76000022888184
trade: 358
cost: 1228.5678157958987
rewards 1.279080760802841
turbulence 22.989999771118164
trade: 372
cost: 1231.512752170563
rewards 0.7024172211044235
turbulence 22.649999618530277
trade: 387
cost: 1234.9705231208804
rewards -0.35819919166564945
turbulence 22.209999084472656
trade: 403
cost: 1234.9705231208804
rewards 1.0070182384490967
turbulence 22.1299991607666
trade: 417
cost: 1234.9705231208804
rewards -0.6967646408081055
turbulence 24.030000686645508
trade: 431
cost: 1234.9705231208804
rewards 0.7427052932739259
```

```
turbulence 22.280000686645508
trade: 446
cost: 1234.9705231208804
rewards -0.3820265177371912
turbulence 22.1299991607666
trade: 462
cost: 1242.7781122970584
rewards 0.18463774964637125
turbulence 22.049999237060547
trade: 477
cost: 1244.2783433418276
rewards -0.4869882465362549
turbulence 21.350000381469727
trade: 492
cost: 1244.2783433418276
rewards 0.29758663498421667
turbulence 21.51000022888184
trade: 506
cost: 1245.608942504883
rewards -0.3312504714294453
turbulence 22.540000915527344
trade: 521
cost: 1247.346498291016
rewards 0.5589814460754394
turbulence 22.71999931335449
trade: 538
cost: 1247.346498291016
rewards 0.2117473323505372
turbulence 22.540000915527344
trade: 553
cost: 1247.7764836540225
rewards 1.6910999618530391
turbulence 22.3700008392334
trade: 568
cost: 1247.7764836540225
rewards 0.6981940296424786
turbulence 22.030000686645508
trade: 582
cost: 1271.040262088776
rewards 2.422603162765503
turbulence 23.270000457763672
trade: 597
cost: 1271.040262088776
rewards 1.065727935416787
turbulence 24.46999931335449
trade: 613
cost: 1296.5034768905643
rewards 0.45047327643700413
```

```
turbulence 22.959999084472656
trade: 627
cost: 1313.763907100678
rewards -0.38997271270751954
turbulence 26.40999984741211
trade: 643
cost: 1313.763907100678
rewards 0.94202640914917
turbulence 26.1200008392334
trade: 658
cost: 1313.763907100678
rewards 1.455601181943901
turbulence 26.56999969482422
trade: 672
cost: 1331.5620394439702
rewards -4.148999341955967
turbulence 33.599998474121094
trade: 686
cost: 1345.6979455757146
rewards -0.33372990058516155
turbulence 30.75
trade: 699
cost: 1347.759631481171
rewards -3.507345194244385
turbulence 31.459999084472656
trade: 714
cost: 1347.759631481171
rewards 2.1007080520782386
turbulence 28.809999465942383
trade: 731
cost: 1352.1867248344424
rewards -1.5575074007820107
turbulence 29.709999084472656
trade: 747
cost: 1356.3774318733217
rewards 0.6442381217956543
turbulence 26.8700008392334
trade: 762
cost: 1356.3774318733217
rewards 1.4761892669677734
turbulence 25.850000381469727
trade: 776
cost: 1356.3774318733217
rewards 0.07561058092308232
turbulence 25.59000015258789
trade: 791
cost: 1357.6214799728396
rewards -0.08425931816101075
```

```
turbulence 26.040000915527344
trade: 807
cost: 1357.6214799728396
rewards -0.8590645172119141
turbulence 26.459999084472656
trade: 822
cost: 1357.6214799728396
rewards -1.5304067474365235
turbulence 25.82999992370605
trade: 836
cost: 1357.6214799728396
rewards -1.1281585292816163
turbulence 27.780000686645508
trade: 851
cost: 1357.6214799728396
rewards 1.184592444229126
turbulence 26.86000061035156
trade: 865
cost: 1357.6214799728396
rewards -1.8051066132724751
turbulence 28.57999992370605
trade: 881
cost: 1358.8415204734804
rewards -0.1964672431945801
turbulence 28.51000022888184
trade: 896
cost: 1358.8415204734804
rewards 2.0081616020202637
turbulence 26.3799991607666
trade: 913
cost: 1358.8415204734804
rewards 1.9789756355285646
turbulence 26.190000534057617
trade: 926
cost: 1358.8415204734804
rewards -0.5840120437622071
turbulence 26.270000457763672
trade: 941
cost: 1358.8415204734804
rewards 1.0826138286624802
turbulence 26.3700008392334
trade: 956
cost: 1361.6888944015504
rewards 0.5279477315200959
turbulence 26.700000762939453
trade: 971
cost: 1362.7868126602175
rewards -0.9803399887084961
```

```
turbulence 27.6299991607666
trade: 986
cost: 1362.7868126602175
rewards 2.1538065357208254
turbulence 27.959999084472656
trade: 1001
cost: 1362.7868126602175
rewards -2.0041925563812257
turbulence 29.479999542236328
trade: 1015
cost: 1362.7868126602175
rewards 2.2642400848388675
turbulence 28.059999465942383
trade: 1032
cost: 1362.7868126602175
rewards 0.0775539852142334
turbulence 26.36000061035156
trade: 1048
cost: 1362.7868126602175
rewards 0.7808753040313721
turbulence 25.0
trade: 1061
cost: 1362.7868126602175
rewards 1.429466737751756
turbulence 25.06999969482422
trade: 1076
cost: 1365.3373878707887
rewards -1.0432076587677002
turbulence 26.06999969482422
trade: 1090
cost: 1365.3373878707887
rewards -0.4732654319763184
turbulence 26.399999618530277
trade: 1105
cost: 1365.3373878707887
rewards 0.06855588073730469
turbulence 26.96999931335449
trade: 1119
cost: 1365.3373878707887
rewards 0.2715116156257689
turbulence 27.40999984741211
trade: 1134
cost: 1369.6635037994386
rewards -1.605097235107422
turbulence 29.18000030517578
trade: 1149
cost: 1369.6635037994386
rewards 1.0029143836975098
```

```
turbulence 29.350000381469727
trade: 1163
cost: 1369.6635037994386
rewards 0.06473773727416993
turbulence 28.649999618530277
trade: 1178
cost: 1369.6635037994386
rewards 0.5546677633400076
turbulence 28.11000061035156
trade: 1193
cost: 1378.8470383071901
rewards -0.10235806273079943
turbulence 27.549999237060547
trade: 1207
cost: 1385.4783858299259
rewards -2.6404329278080025
turbulence 32.459999084472656
trade: 1224
cost: 1387.371666900635
rewards -0.41950980033874513
turbulence 33.349998474121094
trade: 1239
cost: 1387.371666900635
rewards -3.9667300284484868
turbulence 40.27999877929688
trade: 1254
cost: 1396.2878571472172
rewards 0.7947139389038086
turbulence 37.59000015258789
trade: 1271
cost: 1396.2878571472172
rewards -1.5680626273254399
turbulence 38.02000045776367
trade: 1286
cost: 1402.6202270507815
rewards 1.1828768882751466
turbulence 37.130001068115234
trade: 1301
cost: 1402.6202270507815
rewards 2.074723623275757
turbulence 35.54999923706055
trade: 1316
cost: 1402.6202270507815
rewards 1.23102576751709
turbulence 29.56999969482422
trade: 1331
cost: 1402.6202270507815
rewards 2.8287108070594957
```

turbulence 27.57999992370605
trade: 1346
cost: 1409.6159429244997
rewards -0.08853139533996582
turbulence 24.86000061035156
trade: 1360
cost: 1409.6159429244997
rewards 2.7284163127899173
turbulence 25.75
trade: 1373
cost: 1409.6159429244997
rewards 0.19419371032714844
turbulence 24.799999237060547
trade: 1389
cost: 1409.6159429244997
rewards 0.49025904350280763
turbulence 23.450000762939453
trade: 1407
cost: 1409.6159429244997
rewards -1.6254208576202394
turbulence 25.350000381469727
trade: 1422
cost: 1409.6159429244997
rewards 1.7580745245086495
turbulence 23.100000381469727
trade: 1437
cost: 1410.455117088318
rewards 2.1280264881134032
turbulence 22.450000762939453
trade: 1453
cost: 1410.455117088318
rewards 0.26758252777406016
turbulence 22.709999084472656
trade: 1466
cost: 1416.2581733932495
rewards -1.3063076099395752
turbulence 23.84000015258789
trade: 1481
cost: 1416.2581733932495
rewards 0.5654525661468506
turbulence 23.11000061035156
trade: 1495
cost: 1416.2581733932495
rewards -1.1088364322662354
turbulence 23.700000762939453
trade: 1511
cost: 1416.2581733932495
rewards 1.1060070545196534

```
turbulence 22.65999984741211
trade: 1526
cost: 1416.2581733932495
rewards 1.7986843875625638
turbulence 21.63999938964844
trade: 1541
cost: 1433.7330004653932
rewards -0.7176688652038574
turbulence 21.25
trade: 1556
cost: 1433.7330004653932
rewards -0.07737993369714823
turbulence 20.84000015258789
trade: 1571
cost: 1448.45158411026
rewards -1.0135441844940185
turbulence 20.56999969482422
trade: 1584
cost: 1448.45158411026
rewards 1.063913032860565
turbulence 20.770000457763672
trade: 1599
cost: 1470.361061870575
rewards -0.10768262443542481
turbulence 21.170000076293945
trade: 1613
cost: 1470.361061870575
rewards 1.2953115899963539
turbulence 21.280000686645508
trade: 1628
cost: 1476.5665387077333
rewards 0.32851146697998046
turbulence 20.790000915527344
trade: 1641
cost: 1476.5665387077333
rewards 0.20697715601501987
turbulence 21.299999237060547
trade: 1656
cost: 1506.3658861503602
rewards 0.2765554973602295
turbulence 20.68000030517578
trade: 1671
cost: 1506.3658861503602
rewards -1.148687607574463
turbulence 22.270000457763672
trade: 1687
cost: 1506.3658861503602
rewards 0.1762213882446289
```

```
turbulence 22.520000457763672
trade: 1700
cost: 1506.3658861503602
rewards -0.3847546479179524
turbulence 23.309999465942383
trade: 1716
cost: 1508.139122379303
rewards -0.148239652633667
turbulence 24.71999931335449
trade: 1731
cost: 1508.139122379303
rewards 1.5669707180023194
turbulence 22.88999938964844
trade: 1749
cost: 1508.139122379303
rewards -0.05194500465393067
turbulence 22.5
trade: 1763
cost: 1508.139122379303
rewards 0.10415278892517091
turbulence 21.93000030517578
trade: 1779
cost: 1508.139122379303
rewards -0.33569941573066175
turbulence 21.56999969482422
trade: 1794
cost: 1517.4229334640504
rewards 0.5834688667297363
turbulence 25.15999984741211
trade: 1810
cost: 1517.4229334640504
rewards 0.03245672721862793
turbulence 24.229999542236328
trade: 1825
cost: 1517.4229334640504
rewards -0.1235805721282959
turbulence 23.309999465942383
trade: 1839
cost: 1517.4229334640504
rewards 0.026771801122277977
turbulence 21.530000686645508
trade: 1854
cost: 1519.051327270508
rewards 0.8992110557556153
turbulence 21.700000762939453
trade: 1870
cost: 1519.051327270508
rewards -0.5540859794616699
```

```
turbulence 23.07999992370605
trade: 1885
cost: 1519.051327270508
rewards -0.16048915155257565
turbulence 22.770000457763672
trade: 1899
cost: 1528.300424888611
rewards 0.26612501373291014
turbulence 22.75
trade: 1914
cost: 1528.300424888611
rewards -2.975888655090332
turbulence 26.96999931335449
trade: 1930
cost: 1528.300424888611
rewards 1.0276539443969728
turbulence 25.34000015258789
trade: 1945
cost: 1528.300424888611
rewards -0.33162209625244143
turbulence 25.06999969482422
trade: 1959
cost: 1528.300424888611
rewards 1.496767864227295
turbulence 22.3700008392334
trade: 1973
cost: 1528.300424888611
rewards 0.7762085594177246
turbulence 21.559999465942383
trade: 1989
cost: 1528.300424888611
rewards -1.168496875
turbulence 24.07999992370605
trade: 2002
cost: 1528.300424888611
rewards -0.07641800003051759
turbulence 23.32999992370605
trade: 2019
cost: 1528.300424888611
rewards 0.2883827018737793
turbulence 22.209999084472656
trade: 2034
cost: 1528.300424888611
rewards -0.6928694480895996
turbulence 23.25
trade: 2050
cost: 1528.300424888611
rewards -0.7467747467041016
```

```
turbulence 24.34000015258789
trade: 2066
cost: 1528.300424888611
rewards 0.9263566932678223
turbulence 23.239999771118164
trade: 2082
cost: 1528.300424888611
rewards 2.0742909980773927
turbulence 21.57999992370605
trade: 2097
cost: 1528.300424888611
rewards 0.286244295501709
turbulence 21.31999969482422
trade: 2114
cost: 1528.300424888611
rewards -0.28469111022949223
turbulence 21.90999984741211
trade: 2127
cost: 1528.300424888611
rewards 0.3146487371612573
turbulence 23.190000534057617
trade: 2143
cost: 1543.595279838562
rewards -0.05905572204589844
turbulence 23.020000457763672
trade: 2158
cost: 1543.595279838562
rewards -2.418741542816162
turbulence 37.209999084472656
trade: 2171
cost: 1543.595279838562
rewards 0.9109244499206544
turbulence 30.209999084472656
trade: 2184
cost: 1543.595279838562
rewards -2.121153773498535
turbulence 33.09000015258789
trade: 2197
cost: 1543.595279838562
rewards 1.6697966156005861
turbulence 30.239999771118164
trade: 2212
cost: 1543.595279838562
rewards 1.705147007751465
turbulence 25.559999465942383
trade: 2226
cost: 1543.595279838562
rewards 0.4824989212036133
```

```
turbulence 22.90999984741211
trade: 2241
cost: 1543.595279838562
rewards 1.710265756292711
turbulence 21.770000457763672
trade: 2256
cost: 1548.1177858810424
rewards 0.5157747329711915
turbulence 20.8700008392334
trade: 2271
cost: 1548.1177858810424
rewards 0.6251923477172852
turbulence 21.239999771118164
trade: 2286
cost: 1548.1177858810424
rewards 0.32375456466674807
turbulence 21.6299991607666
trade: 2302
cost: 1548.1177858810424
rewards -0.690877685546875
turbulence 21.989999771118164
trade: 2317
cost: 1548.1177858810424
rewards 0.4321789199829102
turbulence 21.25
trade: 2332
cost: 1548.1177858810424
rewards -0.021509326934814454
turbulence 19.96999931335449
trade: 2348
cost: 1548.1177858810424
rewards 0.712408585357666
turbulence 21.459999084472656
trade: 2361
cost: 1548.1177858810424
rewards -0.10561864929199219
turbulence 21.5
trade: 2376
cost: 1548.1177858810424
rewards -0.6191677612304688
turbulence 22.489999771118164
trade: 2391
cost: 1548.1177858810424
rewards 0.020710384489456193
turbulence 22.049999237060547
trade: 2406
cost: 1548.982256111145
rewards -1.53374965133667
```

```
turbulence 23.450000762939453
trade: 2420
cost: 1548.982256111145
rewards -0.2667677772521973
turbulence 23.11000061035156
trade: 2437
cost: 1548.982256111145
rewards 2.112872413635254
turbulence 21.34000015258789
trade: 2453
cost: 1548.982256111145
rewards -2.989939503479004
turbulence 28.88999938964844
trade: 2467
cost: 1548.982256111145
rewards -1.6576448570251465
turbulence 27.950000762939453
trade: 2481
cost: 1548.982256111145
rewards 3.3403705398559573
turbulence 23.350000381469727
trade: 2495
cost: 1548.982256111145
rewards -1.0590697319030762
turbulence 24.100000381469727
trade: 2508
cost: 1548.982256111145
rewards -0.9353453369140625
turbulence 26.670000076293945
trade: 2523
cost: 1548.982256111145
rewards -1.2082829451049912
turbulence 28.56999969482422
trade: 2536
cost: 1564.8674475173952
rewards 1.7392573932491477
turbulence 24.65999984741211
trade: 2551
cost: 1579.1877411003113
rewards 0.004918253244762309
turbulence 25.46999931335449
trade: 2567
cost: 1593.8854386024475
rewards 1.5383695236206056
turbulence 24.030000686645508
trade: 2582
cost: 1593.8854386024475
rewards 1.9818641216278077
```

```
turbulence 22.559999465942383
trade: 2596
cost: 1593.8854386024475
rewards 1.4638074489593507
turbulence 21.90999984741211
trade: 2611
cost: 1593.8854386024475
rewards 1.5735525016784668
turbulence 20.690000534057617
trade: 2627
cost: 1593.8854386024475
rewards 0.9527600769066019
turbulence 20.030000686645508
trade: 2642
cost: 1594.172197002411
rewards -0.6398261375427247
turbulence 19.790000915527344
trade: 2656
cost: 1594.172197002411
rewards 1.1487856094360351
turbulence 19.229999542236328
trade: 2671
cost: 1594.172197002411
rewards -2.226450714111328
turbulence 21.57999992370605
trade: 2686
cost: 1594.172197002411
rewards -1.3207221466064454
turbulence 20.950000762939453
trade: 2701
cost: 1594.172197002411
rewards 0.6866352882385254
turbulence 18.8799991607666
trade: 2715
cost: 1594.172197002411
rewards -1.218987607574463
turbulence 20.299999237060547
trade: 2729
cost: 1594.172197002411
rewards -0.8588395172119141
turbulence 21.200000762939453
trade: 2745
cost: 1594.172197002411
rewards 0.5755236030578613
turbulence 19.809999465942383
trade: 2760
cost: 1594.172197002411
rewards 1.4677095535278322
```

```
turbulence 18.86000061035156
trade: 2776
cost: 1594.172197002411
rewards 0.739004493713379
turbulence 20.739999771118164
trade: 2791
cost: 1594.172197002411
rewards -0.6312308654785157
turbulence 19.61000061035156
trade: 2806
cost: 1594.172197002411
rewards 0.29726889953613284
turbulence 19.399999618530277
trade: 2822
cost: 1594.172197002411
rewards 0.9135545867919922
turbulence 17.329999923706055
trade: 2836
cost: 1594.172197002411
rewards 2.2612220260620117
turbulence 17.90999984741211
trade: 2851
cost: 1594.172197002411
rewards -0.20389141845703126
turbulence 18.1200008392334
trade: 2866
cost: 1594.172197002411
rewards 0.16540845184326172
turbulence 17.15999984741211
trade: 2879
cost: 1594.172197002411
rewards 0.3062615364074707
turbulence 16.950000762939453
trade: 2894
cost: 1594.172197002411
rewards 0.9422114326477051
turbulence 16.690000534057617
trade: 2909
cost: 1594.172197002411
rewards -0.46514808349609377
turbulence 16.90999984741211
trade: 2924
cost: 1594.172197002411
rewards 0.6931737686157227
turbulence 16.649999618530273
trade: 2939
cost: 1594.172197002411
rewards -0.6090278358459473
```

```
turbulence 16.989999771118164
trade: 2955
cost: 1594.172197002411
rewards 0.8569804878234863
turbulence 16.56999969482422
trade: 2969
cost: 1594.172197002411
rewards 0.32952988357543944
turbulence 16.25
trade: 2983
cost: 1594.172197002411
rewards -0.8946663925170899
turbulence 17.290000915527344
trade: 2997
cost: 1594.172197002411
rewards -1.6847446449279786
turbulence 18.68000030517578
trade: 3014
cost: 1594.172197002411
rewards 1.0563306350708008
turbulence 17.5
trade: 3027
cost: 1594.172197002411
rewards -0.9721006607055664
turbulence 18.709999084472656
trade: 3043
cost: 1594.172197002411
rewards 1.5755251876831056
turbulence 17.329999923706055
trade: 3057
cost: 1594.172197002411
rewards 0.05450932312011719
turbulence 17.639999389648438
trade: 3073
cost: 1594.172197002411
rewards 0.16551271896362305
turbulence 17.559999465942383
trade: 3089
cost: 1594.172197002411
rewards -1.793858321844484
turbulence 17.280000686645508
trade: 3103
cost: 1609.1739640312196
rewards 0.4095667457580567
turbulence 17.610000610351562
trade: 3117
cost: 1609.1739640312196
rewards -0.7072538475036622
```

```
turbulence 18.61000061035156
trade: 3133
cost: 1609.1739640312196
rewards 0.2136082260131836
turbulence 18.309999465942383
trade: 3147
cost: 1609.1739640312196
rewards -1.1509452644348146
turbulence 19.479999542236328
trade: 3162
cost: 1609.1739640312196
rewards -0.2828526000976563
turbulence 19.149999618530277
trade: 3178
cost: 1609.1739640312196
rewards 1.209538272857666
turbulence 18.38999938964844
trade: 3194
cost: 1609.1739640312196
rewards 1.34789402923584
turbulence 16.690000534057617
trade: 3208
cost: 1609.1739640312196
rewards -0.9537833709716798
turbulence 19.65999984741211
trade: 3224
cost: 1609.1739640312196
rewards -1.3561869170974707
turbulence 21.84000015258789
trade: 3239
cost: 1610.1184981651309
rewards -3.0758456565856935
turbulence 27.59000015258789
trade: 3256
cost: 1610.1184981651309
rewards 1.6389572402954102
turbulence 23.1299991607666
trade: 3270
cost: 1610.1184981651309
rewards 2.210171667480469
turbulence 18.809999465942383
trade: 3286
cost: 1610.1184981651309
rewards -0.45276610488891605
turbulence 19.71999931335449
trade: 3301
cost: 1610.1184981651309
rewards -0.9453276481628419
```

```
turbulence 21.34000015258789
trade: 3317
cost: 1610.1184981651309
rewards -0.4653607261657715
turbulence 22.18000030517578
trade: 3330
cost: 1610.1184981651309
rewards 1.3553340118408204
turbulence 20.670000076293945
trade: 3343
cost: 1610.1184981651309
rewards 0.24782962951660156
turbulence 20.149999618530277
trade: 3358
cost: 1610.1184981651309
rewards 1.3516212699890138
turbulence 18.399999618530277
trade: 3373
cost: 1610.1184981651309
rewards 0.07248434371948242
turbulence 18.84000015258789
trade: 3387
cost: 1610.1184981651309
rewards 0.3647263701957651
turbulence 17.360000610351562
trade: 3401
cost: 1615.0507610206607
rewards 0.8620825950622559
turbulence 16.739999771118164
trade: 3418
cost: 1615.0507610206607
rewards 0.20212798194885254
turbulence 16.760000228881836
trade: 3433
cost: 1615.0507610206607
rewards 0.3124783100128174
turbulence 17.899999618530273
trade: 3448
cost: 1615.0507610206607
rewards 0.10194246788024902
turbulence 17.479999542236328
trade: 3464
cost: 1615.0507610206607
rewards -0.8311201362609864
turbulence 18.040000915527344
trade: 3479
cost: 1615.0507610206607
rewards 1.008642254638672
```

```
turbulence 16.420000076293945
trade: 3495
cost: 1615.0507610206607
rewards 0.09380258712768555
turbulence 16.420000076293945
trade: 3510
cost: 1615.0507610206607
rewards -0.1534192539215088
turbulence 17.06999969482422
trade: 3526
cost: 1615.0507610206607
rewards -0.8663449661254883
turbulence 17.889999389648438
trade: 3540
cost: 1615.0507610206607
rewards 0.4784751533508301
turbulence 16.100000381469727
trade: 3556
cost: 1615.0507610206607
rewards 0.23997429580688479
turbulence 15.649999618530272
trade: 3571
cost: 1615.0507610206607
rewards 0.1374514644622803
turbulence 16.389999389648438
trade: 3586
cost: 1615.0507610206607
rewards -0.33508545150756835
turbulence 17.020000457763672
trade: 3600
cost: 1615.0507610206607
rewards -0.8281800041198731
turbulence 18.149999618530277
trade: 3615
cost: 1615.0507610206607
rewards -0.5904159400939941
turbulence 17.75
trade: 3630
cost: 1615.0507610206607
rewards -1.6115723613739015
turbulence 20.700000762939453
trade: 3646
cost: 1615.0507610206607
rewards 2.3339439067840577
turbulence 17.889999389648438
trade: 3662
cost: 1615.0507610206607
rewards 0.461257808303833
```

```
turbulence 16.65999984741211
trade: 3677
cost: 1615.0507610206607
rewards -0.24571639099121095
turbulence 16.31999969482422
trade: 3692
cost: 1615.0507610206607
rewards 1.2632801887512208
turbulence 15.970000267028809
trade: 3707
cost: 1615.0507610206607
rewards 1.3657956268310547
turbulence 15.619999885559082
trade: 3721
cost: 1615.0507610206607
rewards -0.6594176177978516
turbulence 15.760000228881836
trade: 3735
cost: 1615.0507610206607
rewards 0.21555876388549805
turbulence 16.020000457763672
trade: 3747
cost: 1615.0507610206607
rewards 0.35815011215209963
turbulence 15.829999923706056
trade: 3761
cost: 1615.0507610206607
rewards 0.7876763763427734
turbulence 15.479999542236328
trade: 3776
cost: 1615.0507610206607
rewards 0.9164602863311768
turbulence 15.06999969482422
trade: 3791
cost: 1615.0507610206607
rewards -0.12405575103759767
turbulence 16.440000534057617
trade: 3806
cost: 1615.0507610206607
rewards 0.33612799949646
turbulence 16.200000762939453
trade: 3821
cost: 1615.0507610206607
rewards -0.5796132183074951
turbulence 19.0
trade: 3835
cost: 1615.0507610206607
rewards 1.4487080562591554
```

```
turbulence 16.18000030517578
trade: 3850
cost: 1615.0507610206607
rewards -0.1693503505706787
turbulence 16.170000076293945
trade: 3865
cost: 1615.0507610206607
rewards -0.5389423188499408
turbulence 17.1200008392334
trade: 3880
cost: 1630.202488033295
rewards 0.4663365808929317
turbulence 16.329999923706055
trade: 3894
cost: 1632.6984230308535
rewards -0.4504100540161133
turbulence 17.010000228881836
trade: 3908
cost: 1632.6984230308535
rewards -0.9327871273040772
turbulence 18.450000762939453
trade: 3921
cost: 1632.6984230308535
rewards -3.0586099182128907
turbulence 22.5
trade: 3935
cost: 1632.6984230308535
rewards 2.2073428928375245
turbulence 19.729999542236328
trade: 3948
cost: 1632.6984230308535
rewards 1.191795343208313
turbulence 17.90999984741211
trade: 3964
cost: 1644.2547527580264
rewards 0.6279448276519776
turbulence 17.690000534057617
trade: 3978
cost: 1644.2547527580264
rewards 1.2161491664886475
turbulence 17.200000762939453
trade: 3993
cost: 1644.2547527580264
rewards 0.4619287143707276
turbulence 17.579999923706055
trade: 4007
cost: 1644.2547527580264
rewards -0.7854229690551758
```

```
turbulence 19.36000061035156
trade: 4021
cost: 1644.2547527580264
rewards 0.08032133140563966
turbulence 18.309999465942383
trade: 4036
cost: 1644.2547527580264
rewards 0.6768932788848877
turbulence 17.700000762939453
trade: 4052
cost: 1644.2547527580264
rewards -0.7992468032836915
turbulence 18.239999771118164
trade: 4066
cost: 1644.2547527580264
rewards -0.2953170895317104
turbulence 19.459999084472656
trade: 4082
cost: 1656.7953609046938
rewards 1.1035207180023194
turbulence 18.040000915527344
trade: 4097
cost: 1656.7953609046938
rewards -0.7067502143859864
turbulence 17.969999313354492
trade: 4111
cost: 1656.7953609046938
rewards 1.3756457884819016
turbulence 17.280000686645508
trade: 4126
cost: 1658.3645451774598
rewards 0.25160149993896486
turbulence 16.149999618530273
trade: 4141
cost: 1658.3645451774598
rewards -0.2138433006286621
turbulence 16.719999313354492
trade: 4156
cost: 1658.3645451774598
rewards 0.06640672220117413
turbulence 16.790000915527344
trade: 4171
cost: 1661.7273921356204
rewards 0.7924263427734375
turbulence 16.170000076293945
trade: 4187
cost: 1661.7273921356204
rewards 0.7898718921661377
```

turbulence 15.59000015258789
trade: 4203
cost: 1661.7273921356204
rewards 0.30264434360235465
turbulence 15.449999809265137
trade: 4219
cost: 1678.2465491905216
rewards 0.08329879875183106
turbulence 16.1200008392334
trade: 4234
cost: 1678.2465491905216
rewards -1.1547588397979738
turbulence 17.90999984741211
trade: 4248
cost: 1678.2465491905216
rewards -1.25615813331604
turbulence 21.56999969482422
trade: 4263
cost: 1678.2465491905216
rewards 0.04642476425170899
turbulence 21.670000076293945
trade: 4278
cost: 1678.2465491905216
rewards 1.5186214241027833
turbulence 18.559999465942383
trade: 4292
cost: 1678.2465491905216
rewards 1.1970507232666017
turbulence 17.149999618530273
trade: 4305
cost: 1678.2465491905216
rewards 0.0993186176300049
turbulence 17.219999313354492
trade: 4319
cost: 1678.2465491905216
rewards 0.15375943222045899
turbulence 16.790000915527344
trade: 4334
cost: 1678.2465491905216
rewards -1.2486577606201172
turbulence 18.84000015258789
trade: 4351
cost: 1678.2465491905216
rewards 0.9501074615478516
turbulence 16.389999389648438
trade: 4363
cost: 1678.2465491905216
rewards 0.07416942672729493

```
turbulence 16.190000534057617
trade: 4379
cost: 1678.2465491905216
rewards -0.22092367515563965
turbulence 16.479999542236328
trade: 4393
cost: 1678.2465491905216
rewards 0.04668709945678711
turbulence 16.110000610351562
trade: 4409
cost: 1678.2465491905216
rewards 0.37765795822143555
turbulence 16.40999984741211
trade: 4425
cost: 1678.2465491905216
rewards -0.29841725082397463
turbulence 16.40999984741211
trade: 4439
cost: 1678.2465491905216
rewards -0.9302917766571045
turbulence 18.13999938964844
trade: 4454
cost: 1678.2465491905216
rewards -0.37105080871582036
turbulence 17.959999084472656
trade: 4468
cost: 1678.2465491905216
rewards -0.09438909263610841
turbulence 18.799999237060547
trade: 4483
cost: 1678.2465491905216
rewards -1.374414430999756
turbulence 20.950000762939453
trade: 4498
cost: 1678.2465491905216
rewards 0.6322000896453858
turbulence 19.3700008392334
trade: 4513
cost: 1678.2465491905216
rewards -0.6029692909240723
turbulence 19.459999084472656
trade: 4528
cost: 1678.2465491905216
rewards 0.9665715946197511
turbulence 18.18000030517578
trade: 4544
cost: 1678.2465491905216
rewards -0.02861098213195801
```

```
turbulence 18.690000534057617
trade: 4559
cost: 1678.2465491905216
rewards -1.1904299098968507
turbulence 20.809999465942383
trade: 4576
cost: 1678.2465491905216
rewards -2.4238551406860354
turbulence 25.709999084472656
trade: 4591
cost: 1678.2465491905216
rewards 0.0674649398803711
turbulence 24.36000061035156
trade: 4604
cost: 1678.2465491905216
rewards 2.0053911296844484
turbulence 20.8700008392334
trade: 4619
cost: 1678.2465491905216
rewards 2.0860572124481203
turbulence 18.6299991607666
trade: 4635
cost: 1678.2465491905216
rewards -0.33025073432922364
turbulence 17.75
trade: 4649
cost: 1678.2465491905216
rewards -0.6631985034942627
turbulence 18.76000022888184
trade: 4664
cost: 1678.2465491905216
rewards -3.150980017471314
turbulence 23.25
trade: 4678
cost: 1678.2465491905216
rewards 0.9177557327270508
turbulence 22.559999465942383
trade: 4693
cost: 1678.2465491905216
rewards -1.6910375988006592
turbulence 23.13999938964844
trade: 4707
cost: 1678.2465491905216
rewards 2.044266703796387
turbulence 21.100000381469727
trade: 4721
cost: 1678.2465491905216
rewards -1.4528477424621582
```

```
turbulence 22.959999084472656
trade: 4735
cost: 1678.2465491905216
rewards 1.4544349075317384
turbulence 21.299999237060547
trade: 4751
cost: 1678.2465491905216
rewards 0.8769406684875489
turbulence 21.0
trade: 4767
cost: 1678.2465491905216
rewards 1.2010749641418457
turbulence 19.540000915527344
trade: 4783
cost: 1678.2465491905216
rewards -0.07122109184265137
turbulence 18.770000457763672
trade: 4797
cost: 1678.2465491905216
rewards -0.46476963233947755
turbulence 20.0
trade: 4813
cost: 1678.2465491905216
rewards -0.29038925209045413
turbulence 19.850000381469727
trade: 4829
cost: 1678.2465491905216
rewards 0.4150749786376953
turbulence 18.63999938964844
trade: 4847
cost: 1678.2465491905216
rewards 1.2326780269622803
turbulence 16.860000610351562
trade: 4861
cost: 1678.2465491905216
rewards 0.1289449390411377
turbulence 16.299999237060547
trade: 4877
cost: 1678.2465491905216
rewards 0.14927572975158693
turbulence 16.309999465942383
trade: 4891
cost: 1678.2465491905216
rewards 0.5826090019226075
turbulence 15.699999809265137
trade: 4906
cost: 1678.2465491905216
rewards 0.3405765495300293
```

```
turbulence 15.489999771118164
trade: 4921
cost: 1678.2465491905216
rewards 0.5537819644927979
turbulence 15.010000228881836
trade: 4934
cost: 1678.2465491905216
rewards -0.12391181198577397
turbulence 15.43000030517578
trade: 4947
cost: 1696.2000648612982
rewards -0.15900377578735353
turbulence 15.239999771118164
trade: 4962
cost: 1696.2000648612982
rewards -0.10770907020568848
turbulence 15.979999542236328
trade: 4975
cost: 1696.2000648612982
rewards 1.1483138450622559
turbulence 16.979999542236328
trade: 4990
cost: 1696.2000648612982
rewards 1.1483138450622559
turbulence 16.979999542236328
trade: 4990
cost: 1696.2000648612982
True
False
{}
```

[21]: 1411917.2918365365

[22]:
```python
def voter(action1, action2, action3, action4):
    # 1:a2c
    # 2:ppo
    # 3:ddpg
    # 4:sac
    action = list()
    for i in range(np.size(action1)):
        print(action1[i], action2[i], action3[i], action4[i])
        sum_buy = 0
        sum_sell = 0
        count_buy = 0
        count_sell = 0
        count_hold = 0
```

```python
        if action1[i] > 0:
            count_buy += 1
            sum_buy += action1[i] * 15
        elif action1[i] == 0:
            count_hold += 1
        else:
            count_sell += 1
            sum_sell += action1[i] * 15

        if action2[i] > 0:
            count_buy += 1
            sum_buy += action2[i] * 50
        elif action2[i] == 0:
            count_hold += 1
        else:
            count_sell += 1
            sum_sell += action2[i] * 50

        if action3[i] > 0:
            count_buy += 1
            sum_buy += action3[i] * 15
        elif action3[i] == 0:
            count_hold += 1
        else:
            count_sell += 1
            sum_sell += action3[i] * 15

        if action4[i] > 0:
            count_buy += 1
            sum_buy += action4[i] * 20
        elif action4[i] == 0:
            count_hold += 1
        else:
            count_sell += 1
            sum_sell += action4[i] * 20

        if count_buy > count_hold and count_buy > count_sell:
            action.append((sum_buy / 100) / count_buy)
        elif count_sell > count_hold and count_sell > count_buy:
            action.append((sum_sell / 100) / count_sell)
        else:
            action.append(action4[i])
    return action
```

```python
[23]: rewards_vote = list()
turbulence_vote = list()
cost_vote = list()
```

```python
trade_vote = list()

obs = e_trade_gym.reset()[0]
# print(obs[0])
while True:
    action1, _states1 = trained_a2c.predict(obs)
    action2, _states2 = trained_ppo.predict(obs)
    action3, _states3 = trained_ddpg.predict(obs)
    action4, _states4 = trained_sac.predict(obs)
    actions = [action1, action2, action3, action4]
    action = voter(action1, action2, action3, action4)
    # choosen_action = voter(reward, benefit, actions)
    obs, rewards, done, info, new = e_trade_gym.step(np.array(action))
    print('rewards', rewards)
    rewards_vote.append(rewards)
    print('turbulence', e_trade_gym.turbulence)
    turbulence_vote.append(e_trade_gym.turbulence)
    print('trade:', e_trade_gym.trades)
    trade_vote.append(e_trade_gym.trades)
    print('cost:', e_trade_gym.cost)
    cost_vote.append(e_trade_gym.cost)
    if done:
        print(done)
        print(info)
        print(new)
        break
e_trade_gym.asset_memory[-1]
```

```
0.35746646 -1.0 -1.0 0.6623285
0.8656444 -1.0 -1.0 0.42018747
-0.11452365 0.9095676 1.0 0.9037851
-1.0 -1.0 -1.0 0.97465086
-1.0 0.935145 1.0 0.5017798
-1.0 -1.0 -1.0 0.9565344
-0.8887894 1.0 1.0 0.983024
0.9388503 -0.17636885 1.0 -0.3906921
0.42142475 -0.4731834 1.0 -0.44915646
-1.0 1.0 -1.0 -0.80407256
0.1104956 -1.0 -1.0 -0.25106
-0.21089357 0.48200864 -1.0 -0.957587
0.13991177 1.0 1.0 0.7446661
1.0 -0.6011685 1.0 -0.9920076
-1.0 0.5358661 1.0 -0.9929884
-0.8979761 1.0 1.0 0.5075903
0.6808051 0.21104228 1.0 0.98511505
1.0 1.0 1.0 0.9660518
1.0 -1.0 -1.0 -0.9625348
```

0.0006504059 0.5024772 -1.0 -0.96872866
-0.59292555 -0.41902435 -1.0 0.9817834
1.0 0.67595387 -1.0 0.96026826
-1.0 -1.0 -1.0 -0.95428777
1.0 -0.46797734 -1.0 0.9844316
-1.0 -0.19466817 1.0 -0.66574085
1.0 -0.8312796 -1.0 -0.6869588
-0.60878086 0.06815871 1.0 0.40079832
1.0 0.07919787 1.0 -0.99069136
-0.45361078 -0.9209565 1.0 -0.9215337
rewards 0.014967431507096627
turbulence 27.68000030517578
trade: 13
cost: 44.25147762298584
0.8372467 -0.32266283 -1.0 0.9950671
1.0 -1.0 -1.0 0.88805246
0.39368618 -0.046589047 1.0 -0.73928726
-1.0 -0.012107149 -1.0 0.79420066
-0.24492684 -0.26265487 1.0 0.91821444
-1.0 1.0 -1.0 0.8520489
-0.530123 1.0 1.0 0.97573876
1.0 1.0 1.0 -0.8059773
0.64696413 -1.0 1.0 -0.84941125
-1.0 -0.8796215 -1.0 0.7164316
-0.51395154 -0.67279047 -1.0 -0.28615177
0.06951316 1.0 -1.0 -0.96412534
1.0 -0.5539098 1.0 0.07188702
1.0 -1.0 1.0 -0.94042826
-0.08968818 -0.5188011 1.0 -0.9463344
-1.0 -1.0 1.0 0.20199025
1.0 0.9511238 1.0 0.95589614
0.75258577 1.0 1.0 0.98171794
1.0 0.15405978 -1.0 -0.98539275
0.7619944 -0.80430907 -1.0 -0.91271764
0.7814623 0.46563336 -1.0 0.98493266
-1.0 1.0 -1.0 0.92139935
-1.0 -0.34681997 -1.0 -0.88593477
1.0 0.032244712 -1.0 0.97724116
-1.0 0.17166176 1.0 -0.5197558
1.0 0.93325526 -1.0 -0.6327592
0.27112854 -1.0 1.0 0.46215272
0.90937024 0.834081 1.0 -0.9942534
-0.33258975 0.95153135 1.0 -0.9535197
rewards 0.1582463432327262
turbulence 27.940000534057617
trade: 29
cost: 128.0043577041626
0.38146442 -0.6789404 -1.0 0.9969245

```
-1.0 -0.16291144 -1.0 -0.58527416
-0.21779978 0.45481527 1.0 -0.7555238
-0.413334 0.75955135 -1.0 0.9316833
0.1508326 -0.5736766 1.0 0.93806815
-1.0 -1.0 -1.0 0.9349222
-1.0 -0.6538364 1.0 0.9826946
1.0 -1.0 1.0 -0.96817994
-0.14129612 -0.027804837 1.0 -0.8953672
-1.0 0.2133113 -1.0 -0.0045921803
1.0 -0.35638455 -1.0 0.64017653
1.0 0.07536572 -1.0 -0.9951175
0.7923537 0.29514083 1.0 0.58160734
1.0 0.24851078 1.0 -0.9908129
-1.0 0.6956897 1.0 -0.96606594
-1.0 0.8530445 1.0 0.92247355
-0.2820664 -0.3630946 1.0 0.9827634
1.0 -0.86554873 1.0 0.9613142
0.9799616 1.0 -1.0 -0.9707344
0.91423804 0.7381284 -1.0 -0.82767844
-0.83439416 1.0 -1.0 0.9555552
-1.0 -1.0 -1.0 0.939657
-0.20726705 -0.7843076 -1.0 -0.97279906
1.0 -0.4533518 -1.0 0.94978285
-1.0 -0.032050222 1.0 -0.2872511
1.0 1.0 -1.0 -0.7586968
0.8400247 -0.16754358 1.0 0.75841904
1.0 0.47871307 1.0 -0.98999274
-1.0 -1.0 1.0 -0.9416287
rewards -0.3280143584441859
turbulence 29.43000030517578
trade: 47
cost: 227.65201624298098
0.3744446 -1.0 -1.0 0.99103594
1.0 -0.944015 -1.0 0.8609772
-0.9751205 -0.13067481 1.0 -0.37440062
-0.27964407 0.2599563 -1.0 0.99379027
-0.27743417 0.9541173 1.0 0.9665334
-1.0 -1.0 -1.0 0.9351392
-0.33425382 -0.6744256 1.0 0.99066496
1.0 -0.5242858 1.0 -0.46109986
-0.31947577 -0.5838243 1.0 -0.5771083
-1.0 -1.0 -1.0 -0.8908811
0.10059702 0.14217436 -1.0 -0.24773246
0.4655917 -0.048781097 -1.0 -0.8465624
0.58955896 1.0 1.0 0.8945254
1.0 -0.3988814 1.0 -0.8091836
-1.0 1.0 1.0 -0.9925254
0.34547007 -1.0 1.0 0.63184094
```

```
1.0 -1.0 1.0 0.976485
1.0 -0.40269756 1.0 0.97639894
1.0 -0.82554173 -1.0 -0.97708267
0.9417629 -1.0 -1.0 -0.88785696
1.0 1.0 -1.0 0.897045
0.10146731 1.0 -1.0 0.9684764
-1.0 1.0 -1.0 -0.6395715
1.0 1.0 -1.0 0.99311304
0.8350489 0.08015388 1.0 -0.44455266
1.0 -0.55800545 -1.0 -0.9119771
1.0 1.0 1.0 0.73200047
1.0 -0.30684632 1.0 -0.9459685
-1.0 0.085673645 1.0 -0.9567515
rewards 0.20087670414696915
turbulence 28.07999992370605
trade: 65
cost: 314.49304514694217
1.0 0.6422446 -1.0 0.9508569
-0.7666491 -1.0 -1.0 0.38916683
-0.8567817 1.0 1.0 -0.85736704
0.3881204 -1.0 -1.0 0.9969144
-1.0 -1.0 1.0 0.9364139
-1.0 -1.0 -1.0 0.87150323
0.003055334 1.0 1.0 0.9928031
0.19985127 0.65616614 1.0 -0.71184415
-0.1827744 -1.0 1.0 -0.25199103
-1.0 1.0 -1.0 -0.9543877
-0.91456646 -0.49454653 -1.0 0.16726732
-1.0 -0.615402 -1.0 -0.89461756
1.0 0.50206685 1.0 0.8596668
1.0 -1.0 1.0 -0.97213495
-0.23304063 -1.0 1.0 -0.65933263
-1.0 0.81263494 1.0 0.98778296
0.43785548 -0.58054733 1.0 0.9071214
1.0 0.7592831 1.0 0.99575686
1.0 0.7943287 -1.0 -0.979827
1.0 0.6316344 -1.0 -0.8677051
-1.0 -1.0 -1.0 0.91066253
0.29335463 -0.044483528 -1.0 0.9733286
-1.0 0.22713906 -1.0 -0.93023694
1.0 0.7800445 -1.0 0.9757875
0.75236416 1.0 1.0 -0.7633477
1.0 0.3762586 -1.0 -0.9655196
0.50847256 -0.9778992 1.0 -0.02237624
1.0 -0.14244205 1.0 -0.7558225
-1.0 -0.4414438 1.0 -0.8238827
rewards -0.4128768226234359
turbulence 29.26000022888184
```

```
trade: 82
cost: 397.0332631111145
0.71398866 -0.32482833 -1.0 0.9261043
-0.3541445 1.0 -1.0 -0.32543182
-1.0 -0.33862504 1.0 -0.7847442
-0.55913675 -0.31594494 -1.0 0.9752822
-0.6685921 0.1517027 1.0 0.5445962
-1.0 -0.50393707 -1.0 0.84534633
0.23423648 -0.21808371 1.0 0.9277539
0.76392895 0.5716282 1.0 -0.28853917
-0.18068606 -0.21514586 1.0 -0.48546457
-1.0 1.0 -1.0 -0.4419576
-0.2895504 0.15116203 -1.0 0.11023033
1.0 0.39288086 -1.0 -0.9921167
1.0 -1.0 1.0 0.81861925
1.0 1.0 1.0 -0.8428179
-1.0 0.14448622 1.0 -0.9813671
-0.84030044 0.0914493 1.0 0.6400292
1.0 -1.0 1.0 0.9780412
1.0 -1.0 1.0 0.97218704
1.0 0.40904224 -1.0 -0.97198385
1.0 -1.0 -1.0 -0.8213406
-0.31304538 -1.0 -1.0 0.96086943
-1.0 -1.0 -1.0 0.9593408
-1.0 0.63608664 -1.0 -0.9822793
1.0 -1.0 -1.0 0.969831
-0.6620519 -0.5664554 1.0 -0.8340826
1.0 -0.6199405 -1.0 -0.9218302
1.0 1.0 1.0 0.76774704
0.6492504 1.0 1.0 -0.9686686
-0.78063965 -1.0 1.0 -0.8536781
rewards 0.41016499330594675
turbulence 27.290000915527344
trade: 100
cost: 444.33738202285775
0.7488627 -1.0 -1.0 0.98907447
0.6012644 -0.121807545 -1.0 -0.14045608
-1.0 0.39959776 1.0 -0.08315575
1.0 1.0 -1.0 0.95729303
-1.0 0.17380883 1.0 0.3017273
-0.6407001 0.5756258 -1.0 0.7396234
-1.0 -0.1355871 1.0 0.9738512
1.0 -0.84202605 1.0 -0.40906543
-0.25056896 -0.49806836 1.0 -0.70339453
-1.0 1.0 -1.0 -0.43534255
1.0 -0.8702171 -1.0 0.6216042
-0.060453236 -0.7908765 -1.0 -0.99498236
0.43422818 -0.5334751 1.0 0.9876677
```

```
1.0 -0.36950397 1.0 -0.8491305
-1.0 1.0 1.0 -0.9654882
-1.0 -1.0 1.0 0.49868095
1.0 0.5574695 1.0 0.9814303
1.0 -1.0 1.0 0.9645951
1.0 -0.29416105 -1.0 -0.90208364
1.0 1.0 -1.0 -0.9736134
-1.0 0.61116207 -1.0 0.9958379
-1.0 1.0 -1.0 0.97003317
-1.0 1.0 -1.0 -0.8947846
1.0 -1.0 -1.0 0.96388566
-1.0 0.2898546 1.0 -0.9734652
1.0 1.0 -1.0 -0.7054954
-0.3128767 -1.0 1.0 0.26752853
1.0 -1.0 1.0 -0.89706755
0.2102778 -1.0 1.0 -0.9915753
rewards -0.2636707941840985
turbulence 32.189998626708984
trade: 119
cost: 553.0851531181337
0.48713824 0.9491309 -1.0 0.8827282
-0.5651374 1.0 -1.0 0.9793376
-1.0 0.07546538 1.0 -0.42009246
0.7714767 0.20700295 -1.0 0.989784
-0.1625301 -1.0 1.0 0.8724685
-0.8886454 0.6019058 -1.0 0.18326879
-1.0 1.0 1.0 0.97915244
0.9260758 0.5842227 1.0 -0.8536791
-0.88361263 0.5790107 1.0 -0.9514925
-1.0 1.0 -1.0 -0.7737758
-0.4057638 1.0 -1.0 -0.24343431
-1.0 -1.0 -1.0 -0.9941382
0.54553777 0.97484636 1.0 0.82589054
1.0 1.0 1.0 -0.9916176
-1.0 -1.0 1.0 -0.9434537
-1.0 -1.0 1.0 0.65074277
0.93186647 -0.5004633 1.0 0.9846947
1.0 0.6613017 1.0 0.9743278
0.0485636 0.5299387 -1.0 -0.950719
-0.25540662 1.0 -1.0 -0.56201303
-1.0 -1.0 -1.0 0.9928155
-1.0 1.0 -1.0 0.59365726
-1.0 0.98653555 -1.0 -0.9785042
1.0 1.0 -1.0 0.89013743
0.644614 -0.64395493 1.0 -0.86393046
1.0 1.0 -1.0 -0.9609008
0.40872496 -0.8815001 1.0 0.8608606
1.0 -1.0 1.0 -0.9492374
```

```
-0.106434464 -0.10501358 1.0 -0.99544823
rewards 0.9272355034923297
turbulence 29.520000457763672
trade: 136
cost: 625.1861805114746
0.7868205 1.0 -1.0 0.9661499
-0.06289607 0.9274627 -1.0 0.87615633
-1.0 -1.0 1.0 0.22729623
-1.0 0.84272575 -1.0 0.9805747
-0.3851046 -0.8813946 1.0 0.90652394
-1.0 0.51901555 -1.0 0.8696269
-1.0 -0.20975156 1.0 0.96331215
-0.83668596 0.506054 1.0 -0.5469675
0.48425585 1.0 1.0 -0.5878295
-1.0 1.0 -1.0 -0.14968443
0.96885943 0.7900938 -1.0 -0.5234666
-0.5659304 -1.0 -1.0 -0.90787435
1.0 0.6818639 1.0 0.9482895
1.0 0.22130126 1.0 -0.98070335
0.33442128 1.0 1.0 -0.8470845
-1.0 1.0 1.0 0.19741392
-0.08234739 1.0 1.0 0.9602063
1.0 0.34263143 1.0 0.90597355
0.93383324 0.2711295 -1.0 -0.952758
-0.65519357 -0.66098005 -1.0 -0.89780253
-1.0 1.0 -1.0 0.9623889
1.0 -0.5504265 -1.0 0.93679357
-1.0 0.18427035 -1.0 -0.91638374
1.0 0.88065535 -1.0 0.9764323
-1.0 -0.35467696 1.0 -0.6876545
1.0 0.13100263 -1.0 -0.926283
-1.0 0.81362873 1.0 0.62664795
0.68137217 1.0 1.0 -0.9487459
-0.3947457 0.62687415 1.0 -0.99012715
rewards 0.5960816270118929
turbulence 27.76000022888184
trade: 157
cost: 761.9997970199585
1.0 -0.76997167 -1.0 0.8725772
-1.0 1.0 -1.0 0.8164041
-1.0 0.31153718 1.0 0.3099165
-0.53024346 -0.18965963 -1.0 0.9961302
-1.0 -1.0 1.0 0.96594834
-1.0 -0.20903489 -1.0 0.9375639
1.0 -0.17329082 1.0 0.97547734
1.0 1.0 1.0 0.669878
-1.0 -1.0 1.0 -0.9526889
-1.0 0.6576121 -1.0 -0.04347509
```

```
0.50578266 1.0 -1.0 0.2570014
-0.8657459 0.029906541 -1.0 -0.9728262
1.0 1.0 1.0 0.935078
1.0 -1.0 1.0 -0.9848865
-1.0 0.61439073 1.0 -0.776461
-1.0 -1.0 1.0 0.53481615
0.35572794 0.3954695 1.0 0.9851248
0.19641101 -0.9656787 1.0 0.9803107
0.1010021 0.07474552 -1.0 -0.8800398
0.74341524 -1.0 -1.0 -0.98424804
-0.98375785 0.99709654 -1.0 0.9886844
-0.6642511 0.46849465 -1.0 0.9713385
-1.0 -1.0 -1.0 -0.93970466
1.0 0.25218204 -1.0 0.9918697
-1.0 -1.0 1.0 -0.94917
1.0 -0.042422146 -1.0 -0.391214
-0.43910092 -0.425763 1.0 0.33030152
1.0 0.56291497 1.0 -0.9560382
-1.0 0.5082892 1.0 -0.94506013
rewards -0.583553838844283
turbulence 28.0
trade: 178
cost: 865.1760982131957
1.0 1.0 -1.0 0.98311555
1.0 -1.0 -1.0 0.2110194
-0.22643107 -0.36232802 1.0 -0.89302886
-0.8201715 -0.3634351 -1.0 0.99226236
-0.7841582 1.0 1.0 0.7412188
-0.7341435 1.0 -1.0 0.69351494
0.46288157 -1.0 1.0 0.9803009
0.9451991 0.13756888 1.0 -0.8330647
-0.47336864 1.0 1.0 -0.748163
-1.0 1.0 -1.0 -0.4354006
1.0 -0.2879069 -1.0 -0.31765997
-1.0 0.04663837 -1.0 -0.93830675
1.0 1.0 1.0 0.8555951
1.0 -1.0 1.0 -0.9587703
-1.0 0.5284066 1.0 -0.982239
-0.38795233 -0.24673086 1.0 0.32505322
1.0 -1.0 1.0 0.9885669
1.0 -0.058613673 1.0 0.95502734
1.0 0.44067574 -1.0 -0.7368336
1.0 1.0 -1.0 -0.97663856
-1.0 -1.0 -1.0 0.94885075
0.77268904 -0.79950106 -1.0 0.98929095
-0.5830461 1.0 -1.0 -0.86518365
1.0 -1.0 -1.0 0.9837246
-1.0 1.0 1.0 -0.7290947
```

```
1.0 -0.6280807 -1.0 -0.9324083
0.93326294 1.0 1.0 0.77031636
0.034869194 -0.8428421 1.0 -0.98055047
-0.86579424 -1.0 1.0 -0.9341025
rewards -0.11307647136803717
turbulence 25.68000030517578
trade: 196
cost: 932.965122959137
1.0 1.0 -1.0 0.98689413
-1.0 -0.7581229 -1.0 0.09689343
-1.0 0.1358703 1.0 -0.7946421
1.0 0.20350675 -1.0 0.99729
-0.06413381 0.70331573 1.0 0.6969174
-1.0 -0.39201176 -1.0 0.93407583
1.0 -1.0 1.0 0.9743383
1.0 0.4454965 1.0 -0.024820268
1.0 -1.0 1.0 -0.96248543
-1.0 -0.7523295 -1.0 -0.5417527
-0.73750097 -0.9847415 -1.0 -0.058929265
0.4048241 -1.0 -1.0 -0.9656005
0.058200598 0.35571945 1.0 0.38843596
1.0 -0.18583818 1.0 -0.98400974
-1.0 0.24418095 1.0 -0.9783908
-1.0 -0.32015973 1.0 0.95612884
-0.6527534 1.0 1.0 0.95214677
0.051892042 -0.027931139 1.0 0.7532611
1.0 -0.98988926 -1.0 -0.9390513
1.0 -1.0 -1.0 -0.9236143
-0.8156383 -1.0 -1.0 0.99654603
-0.0793004 1.0 -1.0 0.9855422
-0.72893906 -1.0 -1.0 -0.8933905
1.0 0.28004003 -1.0 0.9734113
1.0 0.5520907 1.0 -0.6999316
1.0 0.9572554 -1.0 -0.5934252
-0.2394219 -0.37305182 1.0 -0.44990563
1.0 1.0 1.0 -0.9793175
0.1409694 1.0 1.0 -0.98706806
rewards 0.36457267790489134
turbulence 24.459999084472656
trade: 216
cost: 996.232537940979
1.0 -0.25586164 -1.0 0.9060298
-0.41895026 0.51870745 -1.0 0.96584225
-1.0 -0.47616073 1.0 -0.8764186
0.06302044 -0.9260966 -1.0 0.99124885
0.33750945 -0.6242565 1.0 0.8143723
0.049967766 0.48351768 -1.0 0.7600763
-0.516656 0.3744349 1.0 0.73227894
```

```
-1.0 0.1288165 1.0 -0.87606305
0.75574 -1.0 1.0 -0.91457784
-0.7670646 -0.851505 -1.0 -0.32775885
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1.0 0.55017847 1.0 0.9915178
1.0 -1.0 1.0 -0.96378106
-1.0 -1.0 1.0 -0.9415012
rewards 0.28652793527221077
turbulence 24.84000015258789
trade: 235
cost: 1092.768481391907
1.0 0.014998287 -1.0 0.9384377
1.0 0.6392163 -1.0 0.89812493
-0.96860236 -0.9546081 1.0 -0.3345796
-1.0 0.40618497 -1.0 0.9671434
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1.0 1.0 1.0 -0.80089206
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-1.0 1.0 1.0 0.6263697
1.0 0.3776017 1.0 0.9860114
0.16756415 1.0 1.0 0.9761715
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-0.26837185 -1.0 -1.0 0.97717524
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-0.7643047 0.011151969 1.0 -0.8374606
rewards 0.4934689896533964
turbulence 24.31999969482422
trade: 254
cost: 1177.8607999763492
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-0.17849231 -0.61827564 -1.0 -0.012795687
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-1.0 0.26893163 -1.0 0.9647691
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-1.0 0.25663036 -1.0 -0.52055144
-1.0 1.0 -1.0 0.6573988
-1.0 -0.48188883 -1.0 -0.9912485
1.0 0.0021811351 1.0 0.5553222
1.0 0.6627672 1.0 -0.950831
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1.0 1.0 1.0 0.9867246
1.0 0.35015503 1.0 0.80291784
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1.0 0.0216351 -1.0 -0.98078877
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-1.0 -1.0 -1.0 0.90637326
-1.0 -1.0 -1.0 -0.7227739
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1.0 0.9812761 1.0 0.88318336
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-1.0 1.0 1.0 -0.98506135
rewards -1.6252391221107334
turbulence 26.07999992370605
trade: 274
cost: 1287.1713669395444
-1.0 -0.98458594 -1.0 0.93959093
-0.4629786 0.73713183 -1.0 0.39775503
-1.0 1.0 1.0 -0.7876617
0.7728188 0.49760756 -1.0 0.99521494
```

```
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1.0 1.0 1.0 0.20911741
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rewards -0.49888680976562905
turbulence 25.84000015258789
trade: 293
cost: 1379.187245967865
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-1.0 0.077534504 1.0 0.9589915
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1.0 0.9840283 -1.0 -0.9747583
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0.6953498 1.0 1.0 0.48953843
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rewards 0.44268425625191304
turbulence 24.739999771118164
trade: 310
cost: 1437.274935523987
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1.0 -0.36644974 -1.0 0.77433586
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0.8242525 0.27214652 -1.0 0.98904943
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-1.0 -0.86304486 -1.0 -0.69802845
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0.78499067 0.6638562 1.0 0.73267615
0.07709432 1.0 1.0 -0.6390078
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rewards -0.7436191474899301
turbulence 25.440000534057617
trade: 328
cost: 1527.3476169357307
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0.23227361 0.99890554 1.0 -0.89777684
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rewards 0.38482055624580247
turbulence 24.100000381469727
trade: 349
cost: 1546.6438893470772
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-1.0 0.4741726 -1.0 0.69059145
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1.0 -1.0 1.0 -0.9651165
1.0 0.54987466 1.0 0.9499388
```

```
1.0 -0.6089308 1.0 0.9777186
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rewards -0.9596663699745202
turbulence 24.76000022888184
trade: 365
cost: 1555.2245049858102
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0.9470369 -0.48321518 -1.0 0.89213324
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1.0 1.0 -1.0 0.9513707
-1.0 0.4733454 1.0 -0.8603242
1.0 -1.0 -1.0 -0.9878156
1.0 1.0 1.0 0.65856314
0.47169614 1.0 1.0 -0.85594195
-1.0 -1.0 1.0 -0.9651018
rewards 0.6436885035774205
turbulence 24.459999084472656
```

```
trade: 382
cost: 1574.598929660798
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1.0 0.9208081 1.0 -0.9732526
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1.0 -0.26056665 1.0 0.6624367
1.0 -1.0 1.0 -0.9744257
1.0 0.43554944 0.9999999 -0.9505862
1.0 1.0 1.0 0.79291904
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0.24967504 1.0 1.0 0.81986046
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1.0 0.09519239 -1.0 0.9888177
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-1.0 0.86229324 -1.0 -0.96957356
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1.0 -0.33061704 -1.0 -0.82095367
1.0 1.0 1.0 0.69399893
0.65073216 -0.28974214 1.0 -0.9854618
-1.0 -0.3582639 1.0 -0.99646384
rewards 1.489124616214377
turbulence 24.280000686645508
trade: 401
cost: 1590.4806361694343
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-1.0 -1.0 -1.0 0.5955591
-1.0 -0.5058122 1.0 -0.7966203
-0.9424583 0.46733335 -1.0 0.98485374
0.87727904 -0.4366116 1.0 0.9226686
0.47873485 -1.0 -1.0 0.7119894
0.9877527 0.55279934 1.0 0.8833332
1.0 -1.0 1.0 -0.55627275
0.47499847 0.5951376 1.0 -0.7257452
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-1.0 0.82821923 -1.0 -0.9881344
1.0 1.0 1.0 0.4525541
```

```
1.0 0.95003927 1.0 -0.97069967
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1.0 0.47499368 1.0 0.93457365
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0.6716325 1.0 -1.0 0.67428684
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1.0 -0.047251675 -1.0 -0.8501212
1.0 0.145222 1.0 0.89491653
-0.5486529 0.96188074 1.0 -0.9262415
-0.94377965 -1.0 1.0 -0.7783563
rewards -0.25250348073425705
turbulence 23.76000022888184
trade: 420
cost: 1607.305448242188
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-1.0 -1.0 -1.0 0.83956003
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-1.0 -0.15866187 -1.0 0.9574702
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0.35728598 -1.0 1.0 -0.68853545
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-1.0 1.0 -1.0 -0.93797636
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1.0 -1.0 -1.0 0.9332547
1.0 -0.7108974 -1.0 0.9560728
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1.0 0.04073973 -1.0 0.9726813
-1.0 1.0 1.0 -0.810856
1.0 0.3314786 -1.0 -0.7290168
1.0 0.72469723 1.0 0.10590291
0.8329545 1.0 1.0 -0.96145874
```

```
-1.0 -0.4809295 1.0 -0.9420825
rewards 1.4210769806152326
turbulence 22.989999771118164
trade: 436
cost: 1623.7896627807625
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-1.0 -1.0 -1.0 0.6613345
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0.1692653 -0.5803833 1.0 0.81639814
-1.0 0.39558107 -1.0 0.9766629
0.96533316 1.0 1.0 0.982913
0.37570632 0.35562366 1.0 0.30660307
1.0 -0.35645366 1.0 -0.84514374
-1.0 0.5129694 -1.0 0.21161962
1.0 0.6164274 1.0 0.35861206
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1.0 -1.0 1.0 0.9376178
1.0 1.0 1.0 -0.9843205
1.0 -0.2925672 1.0 -0.93480676
1.0 1.0 1.0 0.83098793
1.0 -1.0 1.0 0.9484769
1.0 0.4947826 1.0 0.9775388
1.0 1.0 -1.0 -0.9886668
1.0 -1.0 -1.0 -0.94397
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0.36427772 0.70158887 -1.0 0.9843191
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1.0 1.0 -1.0 0.86016905
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1.0 -0.5307524 1.0 0.85545754
-0.37037814 -1.0 1.0 -0.97941124
-1.0 -1.0 1.0 -0.99149853
rewards 0.5869586901283358
turbulence 22.649999618530277
trade: 454
cost: 1659.2979229354867
0.17309117 -0.91020525 -1.0 0.99067795
-1.0 -0.5830601 -1.0 -0.12297934
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-1.0 -0.8328524 -1.0 0.97919345
-1.0 0.5749214 1.0 0.9653096
-1.0 1.0 -1.0 0.97601795
1.0 1.0 1.0 0.99674356
0.881382 0.61102974 1.0 -0.7760375
-0.41518793 -0.058502965 1.0 -0.84508896
-1.0 -0.69529676 -1.0 -0.89361453
```

```
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-1.0 0.35095865 -1.0 -0.944614
0.5966023 1.0 1.0 0.7027718
1.0 -0.67613095 1.0 -0.97589844
1.0 0.14089347 1.0 -0.9683576
1.0 -1.0 1.0 0.9811648
0.049629033 -0.3196846 1.0 0.9695004
1.0 0.42695564 1.0 0.9777036
0.15842247 1.0 -1.0 -0.9347331
1.0 -1.0 -1.0 -0.98481065
1.0 -1.0 -1.0 0.9603274
0.58843 -0.8723323 -1.0 0.95517683
-1.0 -0.9373127 -1.0 -0.97326255
1.0 -0.8167701 -1.0 0.98992324
-0.82754314 1.0 1.0 -0.3428623
1.0 0.8692415 -1.0 -0.9623367
1.0 0.3083833 1.0 0.3700347
0.75790197 -0.20613599 1.0 -0.85289925
-0.7697536 -1.0 1.0 -0.66929275
rewards -0.18661065285949735
turbulence 22.209999084472656
trade: 471
cost: 1674.7553159408578
-1.0 -0.8720194 -1.0 0.9539747
-1.0 1.0 -1.0 0.16403902
-1.0 1.0 1.0 -0.67145467
-1.0 0.763868 -1.0 0.92104006
0.7797871 -0.93101597 1.0 0.81227565
-0.4439702 0.025291786 -1.0 0.8580215
-0.19984603 1.0 1.0 0.96650624
1.0 -0.6059965 1.0 -0.9068895
0.3589397 0.34569812 1.0 -0.9485829
-1.0 0.19930145 -1.0 -0.78949285
1.0 0.1298355 1.0 0.6977891
-1.0 -0.65349305 -1.0 -0.705498
1.0 1.0 1.0 0.79308033
1.0 1.0 1.0 -0.95303476
1.0 0.015272915 1.0 -0.9907422
1.0 1.0 1.0 0.9768313
1.0 -1.0 1.0 0.922681
1.0 1.0 1.0 0.6252159
1.0 0.44901 -1.0 -0.94945985
1.0 -1.0 -1.0 -0.8777456
-0.47255182 -1.0 -1.0 0.9837179
0.020706564 0.19496909 -1.0 0.9556205
-1.0 0.6912619 -1.0 -0.6337786
1.0 1.0 -1.0 0.9810766
-1.0 -1.0 1.0 -0.95554745
```

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1.0 -0.19259039 -1.0 -0.8914589
1.0 -0.9012414 1.0 0.63568664
-0.21727698 -0.912277 1.0 -0.95738924
-1.0 1.0 1.0 -0.9697603
rewards 1.4537588509361261
turbulence 22.1299991607666
trade: 489
cost: 1692.1934140930186
0.5343215 0.5166516 -1.0 0.9892199
-0.91922 0.57174623 -1.0 0.919657
-1.0 -0.9907163 1.0 -0.6173841
-1.0 1.0 -1.0 0.9712076
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-0.9525824 0.19106403 -1.0 0.45451212
1.0 -0.007801473 1.0 0.9489547
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-0.38727704 0.3615087 1.0 -0.9075247
-1.0 0.30938613 -1.0 -0.5143077
1.0 0.40830103 1.0 0.95898974
-1.0 -0.80023056 -1.0 -0.9479638
1.0 0.3639893 1.0 0.6348045
1.0 -0.73734426 1.0 -0.97066885
1.0 1.0 1.0 -0.9640193
1.0 0.20714469 1.0 0.6974001
0.5584595 -1.0 1.0 0.9644538
1.0 0.87034076 1.0 0.8935014
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1.0 0.60921067 -1.0 -0.95552725
0.17434758 0.7734066 -1.0 0.9782634
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-1.0 -1.0 -1.0 -0.49005914
1.0 -1.0 -1.0 0.927889
0.11788854 0.31589717 1.0 -0.8517466
1.0 -1.0 -1.0 -0.9083693
1.0 1.0 1.0 -0.13386458
1.0 1.0 1.0 -0.90818006
-1.0 1.0 1.0 -0.94383955
rewards -0.6858494694088004
turbulence 24.030000686645508
trade: 509
cost: 1692.2886979331981
0.035121262 -1.0 -1.0 0.96219707
-1.0 1.0 -1.0 0.9285996
-1.0 0.8356936 1.0 0.12117922
-1.0 0.97322565 -1.0 0.97674036
-0.60050964 0.19484691 1.0 0.79842913
-0.47625768 0.76260096 -1.0 0.5156536
1.0 0.51285404 1.0 0.9376116
```

```
1.0 -0.08792844 1.0 -0.32934326
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-1.0 -0.97368693 -1.0 -0.47049344
1.0 1.0 1.0 -0.78198195
-1.0 -0.588559 -1.0 -0.90087426
1.0 0.45748037 1.0 -0.08950347
1.0 0.5830685 1.0 -0.9883674
1.0 -1.0 1.0 -0.99731076
1.0 0.036386758 1.0 0.9798423
-0.71577597 -1.0 1.0 0.96251345
1.0 1.0 1.0 0.92951
1.0 0.4444369 -1.0 -0.93154496
1.0 -0.68214756 -1.0 -0.7908823
-1.0 -1.0 -1.0 0.902786
-0.45590416 -1.0 -1.0 0.92748046
-1.0 -1.0 -1.0 -0.97383666
1.0 1.0 -1.0 0.9912534
-1.0 -1.0 1.0 -0.29751366
0.84258485 -0.18251872 -1.0 -0.7483775
1.0 0.79756635 1.0 0.69207084
0.45929235 -0.17006844 1.0 -0.9863863
-1.0 -0.8726498 1.0 -0.97320384
rewards 0.6578878053405788
turbulence 22.280000686645508
trade: 526
cost: 1709.8269500694287
-1.0 0.078237265 -1.0 0.84616995
-1.0 -1.0 -1.0 0.66689885
-0.9968754 0.46093905 1.0 -0.7900248
-1.0 1.0 -1.0 0.97261524
-1.0 1.0 1.0 0.4488417
0.10807049 -0.08858526 -1.0 0.97174156
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-1.0 -0.22006875 1.0 -0.4311428
-1.0 -0.076820366 -1.0 -0.23623288
1.0 1.0 1.0 0.1817323
-1.0 1.0 -1.0 -0.90982425
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0.8755164 -0.6190863 1.0 0.9808407
1.0 -0.5406368 1.0 0.6958008
0.2796514 -0.8883159 -1.0 -0.82276535
1.0 0.2762133 -1.0 -0.9293594
-0.732029 -1.0 -1.0 0.9899992
-0.32980287 -1.0 -1.0 0.96539044
```

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-1.0 0.8915218 -1.0 -0.7787913
1.0 1.0 -1.0 0.96032083
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-0.47641137 -0.6477611 1.0 -0.98090935
-1.0 1.0 1.0 -0.91491723
rewards -0.15876279065781274
turbulence 22.1299991607666
trade: 543
cost: 1740.23122764969
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-1.0 0.358315 -1.0 0.13188243
-1.0 1.0 1.0 -0.6950321
-1.0 -1.0 -1.0 0.9789686
0.10446428 -1.0 1.0 0.4062034
-1.0 -1.0 -1.0 0.96930003
-1.0 -0.04516168 1.0 0.9366126
0.28839612 -0.4505243 1.0 -0.27500272
-1.0 -0.10904388 1.0 -0.85352635
-1.0 -1.0 -1.0 -0.83194494
1.0 -0.57606834 1.0 0.14436531
-1.0 0.15456223 -1.0 -0.9956625
1.0 -0.40862864 1.0 0.7029358
1.0 -1.0 1.0 -0.9643905
1.0 -0.2879615 1.0 -0.96664876
1.0 0.54815173 1.0 0.8515841
1.0 -1.0 1.0 0.9952762
1.0 -1.0 1.0 0.684845
-0.5871664 -0.78922695 -1.0 -0.9407218
1.0 -1.0 -1.0 -0.9807136
0.56908655 1.0 -1.0 0.94563866
1.0 1.0 -1.0 0.98729134
-1.0 -0.3196737 -1.0 -0.43782383
1.0 0.9407563 -1.0 0.9942932
0.9356379 1.0 1.0 -0.9630607
1.0 -0.68212634 -1.0 -0.9063405
0.84233737 0.98268235 1.0 0.90030885
-1.0 -0.6517441 1.0 -0.93533427
-1.0 0.3041096 1.0 -0.9739415
rewards 0.038612194582750094
turbulence 22.049999237060547
trade: 559
cost: 1762.4070303878796
-1.0 -0.48913193 -1.0 0.9699943
-0.5619594 1.0 -1.0 0.7526324
-1.0 0.78082347 1.0 -0.71913207
-1.0 -0.17763826 -1.0 0.99686253
```

```
-1.0 0.34607208 1.0 0.9507204
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-0.8355561 -1.0 1.0 -0.5467943
-1.0 0.6359941 -1.0 0.167297
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-1.0 0.16714247 -1.0 -0.6943984
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1.0 -1.0 1.0 -0.95902073
1.0 1.0 1.0 0.966419
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1.0 0.7049871 -1.0 -0.89694107
1.0 0.7887101 -1.0 -0.8568854
1.0 1.0 -1.0 0.97271633
-1.0 1.0 -1.0 0.9213847
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1.0 -1.0 1.0 0.46323133
-0.2906881 0.5364822 1.0 -0.98671377
-1.0 -0.3137511 1.0 -0.9481555
rewards -0.6778532274951926
turbulence 21.350000381469727
trade: 577
cost: 1770.0265169487013
-1.0 0.0005070567 -1.0 0.2504077
-1.0 -0.021714076 -1.0 0.28612614
-1.0 -0.74907315 1.0 -0.49020946
-1.0 -0.5080126 -1.0 0.9961914
-1.0 0.9470289 1.0 0.43766284
-0.9793622 0.066197544 -1.0 0.96592367
1.0 1.0 1.0 0.41673243
1.0 -1.0 1.0 -0.85131824
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-1.0 -1.0 -1.0 -0.04312229
1.0 0.099281654 1.0 0.60241055
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1.0 -0.46966967 1.0 -0.89640665
1.0 -0.49376148 1.0 -0.9902414
1.0 -0.40045935 1.0 0.9638431
0.8683642 1.0 1.0 0.9942732
0.32139003 0.39085862 1.0 0.9111862
1.0 -1.0 -1.0 -0.9545668
```

```
1.0 -0.72144926 -1.0 -0.93518096
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-1.0 1.0 -1.0 -0.7862456
1.0 0.87512887 -1.0 0.98798347
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1.0 -0.47812393 -1.0 -0.7354667
1.0 -1.0 1.0 0.59251106
0.8583485 -1.0 1.0 -0.9809122
-0.9052708 -0.24969448 1.0 -0.8217113
rewards 0.3127762264884892
turbulence 21.51000022888184
trade: 593
cost: 1779.3916591377272
-1.0 1.0 -1.0 0.95533395
-1.0 0.66986704 -1.0 0.24365187
-1.0 0.21128131 0.99999976 -0.7632841
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-0.83263373 1.0 1.0 0.8402002
0.8530872 -0.81865406 -1.0 0.997056
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-1.0 1.0 1.0 -0.27197546
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0.046626806 0.23293376 1.0 0.16475034
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0.71677345 0.8226844 1.0 0.9007964
1.0 0.40582216 1.0 -0.9212873
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0.11312491 -1.0 1.0 0.99095535
0.9459553 1.0 1.0 0.9607651
1.0 1.0 -1.0 -0.92043483
1.0 1.0 -1.0 -0.9864197
-1.0 -0.22999209 -1.0 0.99467516
-0.38721335 0.6773946 -1.0 0.7321671
-1.0 0.4499792 -1.0 -0.9106927
1.0 0.768774 -1.0 0.98286843
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1.0 1.0 -1.0 -0.65512383
0.8977065 -0.95008606 1.0 0.37470317
1.0 1.0 1.0 -0.8860321
-1.0 0.22312748 1.0 -0.9944264
rewards -0.20826582974280464
turbulence 22.540000915527344
trade: 612
cost: 1788.0507881698622
-1.0 -1.0 -1.0 0.89063716
```

```
-1.0 -0.896354 -1.0 -0.5664183
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-1.0 1.0 -1.0 0.68279314
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1.0 0.4773495 1.0 -0.6260776
-0.20166188 0.801084 1.0 -0.7457595
-1.0 -0.93310535 -1.0 -0.8475431
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1.0 -1.0 1.0 0.21354699
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1.0 -1.0 -1.0 -0.96647924
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1.0 1.0 -1.0 0.9545257
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1.0 0.50357974 1.0 0.66760266
-1.0 1.0 1.0 -0.92555636
-1.0 -0.5907063 1.0 -0.9713925
rewards 0.45071998570289
turbulence 22.71999931335449
trade: 629
cost: 1815.0671100349439
-1.0 1.0 -1.0 0.9426966
-1.0 -1.0 -1.0 0.5177071
-1.0 -0.69117475 0.99999976 -0.75671023
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1.0 1.0 1.0 -0.93191975
1.0 0.09797041 1.0 -0.9976232
0.5217221 1.0 1.0 0.9655268
```

```
1.0 -0.76673704 1.0 0.9897802
1.0 1.0 1.0 0.9738698
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1.0 -0.9831371 -1.0 -0.6277807
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0.000846833 0.5308153 -1.0 0.95666456
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1.0 -1.0 1.0 0.75286424
-0.49472165 0.9117501 1.0 -0.9656036
-1.0 0.2210064 1.0 -0.9935012
rewards 0.645805302386859
turbulence 22.540000915527344
trade: 648
cost: 1851.4681915435804
0.3516733 0.33477348 -1.0 0.97369766
-1.0 1.0 -1.0 0.85750425
-1.0 0.6985823 0.99999964 0.009561658
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1.0 0.4809816 -1.0 0.55118895
1.0 1.0 1.0 0.932436
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-1.0 -1.0 -1.0 -0.43524557
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1.0 1.0 1.0 0.98671424
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1.0 0.61028486 -1.0 0.96321344
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1.0 0.014597744 -1.0 0.9856205
-0.7498531 -0.8257969 1.0 -0.4358002
1.0 -1.0 -1.0 -0.8979831
1.0 1.0 1.0 0.8495438
-0.1309245 -1.0 1.0 -0.97811794
-1.0 -1.0 1.0 -0.9305485
rewards 1.8610386299354607
turbulence 22.3700008392334
```

```
trade: 667
cost: 1866.8379041519179
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-1.0 -0.2778448 -1.0 0.8108766
-1.0 -1.0 1.0 -0.96172917
-1.0 -0.85218394 -1.0 0.9655603
1.0 1.0 1.0 0.8844751
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1.0 1.0 1.0 0.91430557
0.9799046 -0.8711064 1.0 -0.40557003
-0.49622482 -1.0 1.0 -0.78815675
-1.0 1.0 -1.0 -0.8582932
1.0 -0.7576114 1.0 -0.11430985
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1.0 1.0 1.0 0.70160484
1.0 1.0 1.0 -0.9745648
1.0 -0.58435875 1.0 -0.96055204
0.9832498 0.02678299 1.0 0.9309511
1.0 -1.0 1.0 0.93729687
1.0 0.7100589 1.0 0.9438286
1.0 0.097049594 -1.0 -0.92573535
1.0 0.4938828 -1.0 -0.962185
1.0 -0.04363188 -1.0 0.9837276
1.0 1.0 -1.0 0.98704183
-0.6587806 0.8006673 -1.0 -0.9134294
1.0 -0.5805346 -1.0 0.9965646
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1.0 -1.0 -1.0 -0.97150624
1.0 1.0 1.0 0.5752876
-0.9329316 0.043255314 1.0 -0.7788299
-1.0 -1.0 1.0 -0.98073655
rewards 0.5800174489829922
turbulence 22.030000686645508
trade: 684
cost: 1895.5980227813732
-0.19395024 -1.0 -1.0 0.9558699
-1.0 0.14866407 -1.0 0.8930986
-1.0 -1.0 1.0 0.17740595
-1.0 -0.4797982 -1.0 0.9654449
0.47478196 0.053586975 1.0 0.51378834
-0.7173908 1.0 -1.0 0.9687321
1.0 1.0 1.0 0.82223034
0.88536286 -0.39608163 1.0 -0.92049676
0.061970398 0.47783297 1.0 -0.81855524
-1.0 1.0 -1.0 -0.6751702
1.0 1.0 1.0 -0.742088
-1.0 0.29295552 -1.0 -0.98355365
0.85477453 0.654118 1.0 0.84376025
```

```
1.0 0.005578965 1.0 -0.9706207
1.0 -0.29491743 1.0 -0.9301039
1.0 0.48820898 1.0 0.78999424
-0.039058805 -0.6583462 1.0 0.90586615
1.0 1.0 1.0 0.9970746
1.0 0.24152134 -1.0 -0.8783611
1.0 1.0 -1.0 -0.9239731
-1.0 0.101734966 -1.0 0.9981053
0.60746133 -1.0 -1.0 0.936829
-1.0 -1.0 -1.0 -0.9433579
1.0 1.0 -1.0 0.95999336
1.0 -1.0 1.0 -0.84592736
1.0 -0.8388065 -1.0 -0.84203994
1.0 0.4203856 1.0 0.8875375
-0.10835602 -0.60116374 1.0 -0.9457627
-1.0 -0.66869605 1.0 -0.9735333
rewards 2.6451660910453882
turbulence 23.270000457763672
trade: 702
cost: 1908.1408324203503
1.0 -1.0 -1.0 0.9376141
-1.0 0.45570573 -1.0 0.57131684
-1.0 -0.2725018 1.0 0.2941134
-1.0 -0.9999447 -1.0 0.96620584
0.7349651 -1.0 1.0 0.8669622
-1.0 -1.0 -1.0 0.7123194
1.0 1.0 1.0 0.9809011
1.0 -0.3653841 1.0 -0.5915837
1.0 1.0 1.0 -0.8944932
-1.0 -0.17235896 -1.0 -0.6712554
1.0 -0.94380003 1.0 -0.43491346
-1.0 -0.22416629 -1.0 -0.9120643
1.0 1.0 1.0 -0.09964895
1.0 -0.8613814 1.0 -0.99182653
1.0 1.0 1.0 -0.95947856
1.0 -1.0 1.0 0.8406298
1.0 0.12114304 1.0 0.9895669
1.0 -0.4465376 1.0 0.9817755
1.0 0.8980527 -1.0 -0.9379403
1.0 -1.0 -1.0 -0.898423
1.0 0.70372146 -1.0 0.9860605
-0.26779655 -0.39723814 -1.0 0.97352695
-1.0 1.0 -1.0 -0.93073636
1.0 1.0 -1.0 0.98474956
0.43160453 1.0 1.0 -0.9774437
1.0 0.37071896 -1.0 -0.49724305
1.0 -1.0 1.0 0.82436013
-0.09137317 1.0 1.0 -0.91120505
```

```
-1.0 -0.1270783 1.0 -0.99402344
rewards 1.0407006685005036
turbulence 24.46999931335449
trade: 721
cost: 1939.9432294464123
-1.0 0.4228173 -1.0 0.79227376
-1.0 1.0 -1.0 0.83710957
-1.0 -1.0 0.99999976 -0.90132606
-1.0 -0.05411364 -1.0 0.9261856
-0.40607977 1.0 1.0 0.28192377
-1.0 -0.41817555 -1.0 0.9048666
1.0 -0.93022275 1.0 0.5831052
-1.0 0.16127597 1.0 -0.6461711
-0.7560234 1.0 1.0 -0.9753584
-1.0 0.1333656 -1.0 -0.83798635
1.0 1.0 1.0 -0.49185282
-1.0 0.20694113 -1.0 -0.9344146
1.0 0.60769546 1.0 0.8000026
1.0 -0.6885846 1.0 -0.99631727
1.0 -0.9637913 1.0 -0.9906414
1.0 0.17908418 1.0 0.59772074
1.0 0.28791505 1.0 0.952677
1.0 1.0 1.0 0.98254013
1.0 1.0 -1.0 -0.9375266
1.0 1.0 -1.0 -0.7616034
1.0 -0.44377905 -1.0 0.9983841
-0.15538692 -1.0 -1.0 0.99128413
-1.0 1.0 -1.0 -0.9882594
1.0 0.2425498 -1.0 0.9528525
-0.8921129 -0.0025124252 1.0 -0.8360061
1.0 1.0 -1.0 0.13496494
1.0 -0.15584987 1.0 0.8528892
0.7569337 0.16783488 1.0 -0.4484409
-1.0 1.0 1.0 -0.9779789
rewards 0.15401965186272282
turbulence 22.959999084472656
trade: 738
cost: 1957.0389891090406
-0.3521418 0.6068527 -1.0 0.88520694
-1.0 -1.0 -1.0 0.39892364
-1.0 -0.43498382 0.9999999 -0.3456993
-1.0 0.4924558 -1.0 0.98607874
0.5495271 1.0 1.0 0.94777274
-1.0 -1.0 -1.0 0.96866417
1.0 -1.0 1.0 0.9884381
1.0 1.0 1.0 -0.91434586
-0.95511305 1.0 1.0 -0.9901603
-1.0 0.780462 -1.0 -0.5050543
```

```
1.0 -0.6074767 1.0 -0.016553402
-1.0 1.0 -1.0 -0.96745485
0.63727593 -0.9673499 1.0 -0.14318669
1.0 1.0 1.0 -0.80862385
1.0 1.0 1.0 -0.9418293
1.0 0.9901877 1.0 0.9735285
-0.26696336 0.8595568 1.0 0.94649434
0.9809838 1.0 1.0 0.9855325
1.0 1.0 -1.0 -0.9657204
1.0 -1.0 -1.0 -0.9100301
-0.056535136 -0.9406764 -1.0 0.99072826
0.6752846 0.9785875 -1.0 0.98624504
-1.0 -0.17520559 -1.0 -0.9804473
1.0 1.0 -1.0 0.990708
1.0 -0.119110376 1.0 -0.8874511
1.0 -1.0 -1.0 -0.9603718
1.0 -1.0 1.0 0.21690786
-1.0 -1.0 1.0 -0.9722022
-0.82472825 -0.20466837 1.0 -0.941962
rewards -0.06850993917006999
turbulence 26.40999984741211
trade: 755
cost: 2001.101744457246
0.56093746 0.3198139 -1.0 0.9537134
-1.0 -1.0 -1.0 0.6394174
-1.0 1.0 0.9999995 -0.97169816
-0.84874475 -1.0 -1.0 0.973624
0.41827178 0.1028539 1.0 0.3256414
0.025146127 0.48195088 -1.0 0.9670917
-0.10484028 -0.77965784 1.0 0.8876282
1.0 1.0 1.0 -0.78511626
-1.0 -1.0 1.0 -0.98404074
-1.0 0.7272091 -1.0 -0.04578519
1.0 -1.0 1.0 0.8587191
-1.0 -0.16388552 -1.0 -0.97903574
1.0 1.0 1.0 0.9631636
1.0 1.0 1.0 -0.98253053
1.0 0.2025918 1.0 -0.9617207
1.0 -0.48754174 1.0 0.9745226
1.0 -0.14726907 1.0 0.9908185
1.0 0.4835009 1.0 0.9483347
1.0 -0.4582707 -1.0 -0.9818467
1.0 0.75738865 -1.0 -0.9751154
1.0 -0.5873392 -1.0 0.99552155
0.6769731 1.0 -1.0 0.9932288
-1.0 -1.0 -1.0 -0.86475986
1.0 0.09324753 -1.0 0.9596931
0.45280993 1.0 1.0 0.08527613
```

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1.0 0.70128006 -1.0 -0.7736654
1.0 1.0 1.0 0.6382861
-0.47904098 -0.36003745 1.0 -0.9288327
-1.0 1.0 1.0 -0.9558605
rewards 1.380940824206546
turbulence 26.1200008392334
trade: 774
cost: 2024.851472820283
-1.0 0.13891405 -1.0 0.9871881
-1.0 0.45228037 -1.0 0.8406515
-1.0 1.0 0.99999976 -0.85340935
-0.031442404 -1.0 -1.0 0.94055367
-0.05907063 1.0 1.0 0.77419364
-0.47737068 -0.12245837 -1.0 0.3425882
-0.58368015 -0.29075193 1.0 0.9722017
1.0 1.0 1.0 -0.99520767
-1.0 -1.0 1.0 -0.8664963
-1.0 -1.0 -1.0 -0.8486281
1.0 0.36815384 1.0 0.10294497
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1.0 -0.23257157 1.0 0.58871484
1.0 0.13488773 1.0 -0.8061191
1.0 0.27615258 1.0 -0.9682279
1.0 0.82442963 1.0 0.30458188
0.17517549 0.10110295 1.0 0.99234116
1.0 0.28420705 1.0 0.6455432
1.0 -0.01685889 -1.0 -0.60787106
1.0 0.374017 -1.0 -0.9560147
0.8262732 0.77158237 -1.0 0.99189043
1.0 1.0 -1.0 0.9647958
-1.0 -1.0 -1.0 -0.9601214
1.0 -0.73026574 -1.0 0.98260176
-0.15179917 -0.28089064 1.0 -0.9390424
1.0 0.0149084795 -1.0 -0.9093573
1.0 1.0 1.0 0.68498003
-1.0 0.74968934 1.0 -0.98552835
-1.0 -0.33559877 1.0 -0.9652741
rewards 1.1538030228424119
turbulence 26.56999969482422
trade: 792
cost: 2037.7529117240917
-1.0 1.0 -1.0 0.96910036
-1.0 0.18965046 -1.0 0.3547926
-1.0 0.8091837 0.99999976 -0.94040745
-1.0 0.7618858 -1.0 0.9929676
-0.22594729 0.7483736 1.0 0.8140876
-1.0 1.0 -1.0 0.92450905
1.0 -0.35548604 1.0 0.9658625
```

```
1.0 -0.18759298 1.0 -0.5873306
-0.21117005 -0.14435956 1.0 -0.98478115
-1.0 0.3554664 -1.0 -0.57928777
0.24538445 0.62965846 1.0 0.7472222
-1.0 -0.40997913 -1.0 -0.9439381
1.0 -1.0 1.0 0.8205855
1.0 -0.003554657 1.0 -0.98871946
1.0 1.0 1.0 -0.9777704
1.0 -0.08018282 1.0 0.80568945
1.0 -1.0 1.0 0.98232615
1.0 0.5065126 1.0 0.9769534
0.9641851 -0.9759164 -1.0 -0.9716447
1.0 1.0 -1.0 -0.9702119
-0.6062195 0.32396725 -1.0 0.99092305
1.0 0.18457639 -1.0 0.9254377
-1.0 -0.012829542 -1.0 -0.91074675
1.0 -0.52673006 -1.0 0.98862267
-1.0 -1.0 1.0 -0.21623665
1.0 1.0 -1.0 -0.92176116
-0.6636126 -0.570936 1.0 0.8993461
0.04789056 1.0 1.0 -0.9753995
-1.0 -1.0 1.0 -0.9795863
rewards -4.375137945938111
turbulence 33.599998474121094
trade: 809
cost: 2037.7529117240917
-1.0 0.876165 -1.0 0.97336674
-1.0 -0.09891102 -1.0 0.537434
-0.66346323 0.26028904 1.0 -0.8691243
-1.0 -0.6083802 -1.0 0.9608035
0.57700074 -0.15815194 1.0 0.7823117
-1.0 0.5395285 -1.0 0.84483886
0.9558306 -1.0 1.0 0.98821473
1.0 1.0 1.0 -0.9839934
1.0 -0.6867833 1.0 -0.0997197
-1.0 -0.22796306 -1.0 -0.66254973
1.0 -0.53448206 1.0 -0.8467645
-1.0 -1.0 -1.0 -0.95719117
-0.78164744 -0.863435 1.0 0.901803
1.0 0.07485347 1.0 -0.9468801
1.0 -1.0 1.0 -0.94523144
1.0 0.61394894 1.0 0.30007434
1.0 0.6212446 1.0 0.9715655
1.0 0.17898837 1.0 0.9261763
1.0 0.059548236 -1.0 -0.9055034
1.0 -1.0 -1.0 -0.990091
-0.47336245 1.0 -1.0 0.9500449
-0.7699222 0.766734 -1.0 0.93949556
```

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-1.0 -0.045440823 -1.0 -0.9395459
1.0 0.49991426 -1.0 0.9897244
1.0 -0.14373162 1.0 -0.924531
1.0 -0.061787274 -1.0 -0.76566756
1.0 1.0 1.0 0.36469078
-1.0 1.0 1.0 -0.9845566
-1.0 -0.73556757 1.0 -0.97697085
rewards -0.12332178741074168
turbulence 30.75
trade: 825
cost: 2048.0899264564528
-0.61661506 -0.77144134 -1.0 0.9354024
-1.0 0.61540186 -1.0 0.9283086
-1.0 0.2662924 1.0 0.012837887
-1.0 -0.8184078 -1.0 0.98865557
0.8582284 0.6150613 1.0 0.5396464
-1.0 -0.5315487 -1.0 0.7866864
0.4740557 -0.39438564 1.0 0.9656162
1.0 1.0 1.0 -0.60046035
-0.9698209 -0.8227229 1.0 -0.7627218
-1.0 0.38648322 -1.0 -0.43916714
1.0 1.0 1.0 -0.49459958
-1.0 -0.9583782 -1.0 -0.8710227
1.0 0.021940619 1.0 0.11286223
1.0 -1.0 1.0 -0.9845827
1.0 0.9147027 1.0 -0.9764519
0.9966408 -0.52976644 1.0 0.74215055
1.0 0.3267485 1.0 0.98826885
1.0 0.5074405 1.0 0.6154038
1.0 -0.23062027 -1.0 -0.9455999
1.0 0.2697463 -1.0 -0.9252267
1.0 -1.0 -1.0 0.9404888
-1.0 0.55734676 -1.0 0.9389725
-1.0 -0.56027627 -1.0 -0.95793325
1.0 -1.0 -1.0 0.99271154
0.19483748 -0.30609035 1.0 -0.86945117
1.0 0.022076637 -1.0 -0.9247524
1.0 -1.0 1.0 0.849499
-1.0 0.9261339 1.0 -0.8140005
-1.0 -1.0 1.0 -0.9508457
rewards -3.5700719804717926
turbulence 31.459999084472656
trade: 843
cost: 2071.759186435701
-0.48435384 1.0 -1.0 0.9541061
-1.0 -1.0 -1.0 0.23548424
-1.0 0.59135985 1.0 0.48753667
-1.0 -0.8357016 -1.0 0.9727824
```

```
0.49300316 0.85945904 1.0 0.84436727
-0.9804767 0.043121383 -1.0 0.9431708
0.8853075 -0.26716703 1.0 0.96100855
1.0 -0.46683425 1.0 -0.8663333
1.0 -0.5675916 1.0 -0.93862766
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1.0 -0.08233783 1.0 0.7828014
-1.0 0.9041471 -1.0 -0.9226391
0.21841407 0.68150914 1.0 -0.2878071
1.0 1.0 1.0 -0.9397759
1.0 1.0 1.0 -0.97611773
1.0 0.09005171 1.0 0.98479545
0.9641264 0.15971324 1.0 0.98603916
0.29042315 1.0 1.0 0.9678726
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1.0 -0.0546884 -1.0 -0.8797509
0.5673953 -0.2914149 -1.0 0.9906124
1.0 -1.0 -1.0 0.91245604
-1.0 -1.0 -1.0 -0.926135
1.0 -0.65623784 -1.0 0.9753845
-0.39755416 0.6333687 1.0 -0.9164322
1.0 1.0 -1.0 -0.95521003
1.0 0.034522645 1.0 0.012611747
-0.26078707 -0.1397177 1.0 -0.20806772
-1.0 -0.16889079 1.0 -0.9823839
rewards 2.2835894714149414
turbulence 28.809999465942383
trade: 861
cost: 2093.28713692856
-1.0 -0.10255398 -1.0 0.58658123
-1.0 -1.0 -1.0 0.96049166
-1.0 1.0 1.0 -0.9501366
-1.0 -1.0 -1.0 0.9937599
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-1.0 1.0 -1.0 0.86881995
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1.0 -1.0 1.0 0.77785325
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1.0 -1.0 1.0 0.087546706
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1.0 -0.42465177 1.0 -0.9419986
1.0 -1.0 1.0 -0.93929553
1.0 -0.996448 1.0 0.9320457
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1.0 0.6589926 1.0 0.9917588
1.0 1.0 -1.0 -0.9393481
```

```
1.0 -1.0 -1.0 -0.99387306
1.0 -1.0 -1.0 0.957198
0.41477418 -1.0 -1.0 0.95957065
-1.0 -0.5223701 -1.0 -0.9656462
1.0 -1.0 -1.0 0.98203254
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1.0 -0.8517943 -1.0 -0.978091
1.0 -1.0 1.0 -0.44221944
-0.3306404 -0.79203403 1.0 -0.98045695
-1.0 -0.23797072 1.0 -0.9657474
rewards -1.7947003191497877
turbulence 29.709999084472656
trade: 878
cost: 2124.096225185396
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-0.7469735 -1.0 -1.0 0.9429623
-1.0 1.0 1.0 -0.18921006
-0.74321985 -0.4535482 -1.0 0.9979485
1.0 0.22386205 1.0 0.5217662
-1.0 -1.0 -1.0 0.9558184
-0.39063203 1.0 1.0 0.9037863
1.0 -1.0 1.0 -0.76147085
-0.19530168 -0.896892 1.0 -0.9502131
-1.0 -1.0 -1.0 -0.779609
1.0 0.7061553 1.0 0.7517357
-1.0 1.0 -1.0 -0.8625584
1.0 1.0 1.0 -0.37502778
1.0 1.0 1.0 -0.97978425
1.0 -1.0 1.0 -0.99207556
1.0 -0.34971994 1.0 0.7798939
-0.6979568 0.0013094842 1.0 0.99623466
1.0 -1.0 1.0 0.9735116
1.0 0.37535256 -1.0 -0.9915581
1.0 1.0 -1.0 -0.98241645
0.114696324 -0.2557005 -1.0 0.98533154
-1.0 0.12159024 -1.0 0.9215219
-1.0 -0.7796515 -1.0 0.016028523
1.0 -0.34473884 -1.0 0.98683584
-1.0 -0.1800817 1.0 -0.8922653
1.0 0.06640638 -1.0 -0.8234002
1.0 1.0 1.0 0.8148937
-0.3494661 0.2510097 1.0 -0.9799072
-1.0 1.0 1.0 -0.9247627
rewards 0.7491498570320196
turbulence 26.8700008392334
trade: 894
cost: 2159.1340203743
0.1133374 -1.0 -1.0 0.98617697
```

```
-1.0 -0.1768362 -1.0 -0.44736993
-1.0 -0.61001813 1.0 -0.89250773
-1.0 -0.9518597 -1.0 0.9831977
0.0820405 0.33699945 1.0 0.8826723
-1.0 0.9581274 -1.0 0.9743147
0.17519742 -1.0 1.0 0.95045924
0.75585294 -0.46559983 1.0 -0.30572975
-0.9478359 -0.46554044 1.0 -0.9270934
-1.0 0.57408893 -1.0 -0.86612666
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-1.0 1.0 -1.0 -0.98807204
1.0 1.0 1.0 0.57568026
1.0 -1.0 1.0 -0.95329833
0.9764092 -1.0 1.0 -0.92433447
1.0 1.0 1.0 0.8980516
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0.919129 1.0 1.0 0.97833276
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1.0 1.0 -1.0 -0.9841228
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-1.0 -1.0 -1.0 -0.90817857
1.0 1.0 -1.0 0.96099067
-1.0 1.0 1.0 -0.42937982
1.0 -0.50680923 -1.0 -0.9264313
1.0 0.19109765 1.0 0.9287367
0.61557764 1.0 1.0 -0.9649999
0.22731209 -0.14986578 1.0 -0.92231756
rewards 1.4326414059211734
turbulence 25.850000381469727
trade: 910
cost: 2172.07630729294
-1.0 -0.11419061 -1.0 0.98592496
-0.42178035 0.85332614 -1.0 0.7904862
-1.0 1.0 1.0 -0.7632651
-1.0 1.0 -1.0 0.9785669
-0.8319528 -0.035468817 1.0 0.8756051
-1.0 -0.97215927 -1.0 0.9869809
0.3760953 1.0 1.0 0.94361377
1.0 1.0 1.0 -0.03197217
0.9047564 0.22431628 1.0 -0.95248806
-1.0 -1.0 -1.0 -0.15846306
1.0 1.0 1.0 0.89767385
-1.0 -1.0 -1.0 -0.97634983
1.0 -1.0 1.0 -0.901817
1.0 0.56108344 1.0 -0.79353464
1.0 0.80247414 1.0 -0.8439485
1.0 -1.0 1.0 0.7904675
```

```
1.0 0.42211464 1.0 0.95815253
1.0 -0.84573615 1.0 0.73282397
0.85159016 1.0 -1.0 -0.9831412
1.0 -0.46819544 -1.0 -0.8537208
-0.28910613 -0.4838636 -1.0 0.907969
0.2430363 0.76402456 -1.0 0.9926374
-1.0 0.04917884 -1.0 -0.9155362
1.0 0.6431803 -1.0 0.9844527
1.0 0.84737694 1.0 -0.8788717
1.0 -1.0 -1.0 -0.16690266
1.0 0.31926095 1.0 0.72617745
-1.0 0.26352295 1.0 -0.91341114
-1.0 0.50982714 1.0 -0.88784146
rewards -0.46785908090553713
turbulence 25.59000015258789
trade: 930
cost: 2212.4684354705823
-1.0 1.0 -1.0 0.8698329
-1.0 0.22508946 -1.0 0.64389455
-1.0 -0.29693902 1.0 -0.9105442
-1.0 -0.62982464 -1.0 0.98975015
0.7691785 1.0 1.0 0.90814364
-1.0 1.0 -1.0 0.19628477
1.0 1.0 1.0 0.9819851
1.0 -1.0 1.0 -0.022648692
0.14802092 0.18925875 1.0 -0.94428235
-1.0 0.6057198 -1.0 -0.97775793
1.0 0.14028826 1.0 0.54474044
-1.0 1.0 -1.0 -0.96398824
0.064991236 1.0 1.0 0.01835525
1.0 -0.72851527 1.0 -0.993216
1.0 1.0 1.0 -0.96671957
0.1248436 1.0 1.0 0.6678853
0.5359573 0.66129136 1.0 0.9833727
0.9948435 1.0 1.0 0.91718316
1.0 -1.0 -1.0 -0.8662871
1.0 0.45779452 -1.0 -0.94284135
0.48915213 -1.0 -1.0 0.99195504
-1.0 1.0 -1.0 0.9008994
-1.0 0.9892609 -1.0 -0.93751425
1.0 0.11751595 -1.0 0.9803643
-0.34319955 0.20030361 1.0 -0.93529207
1.0 1.0 -1.0 -0.7758447
1.0 1.0 1.0 0.950125
1.0 1.0 1.0 -0.93816257
-1.0 -1.0 1.0 -0.6953125
rewards -0.23594744597873651
turbulence 26.040000915527344
```

```
trade: 949
cost: 2219.453872049333
-0.018118143 -0.6565406 -1.0 0.9626787
-1.0 1.0 -1.0 0.38349342
-1.0 -1.0 1.0 -0.52623826
-0.7866723 1.0 -1.0 0.97823477
1.0 -1.0 1.0 0.5826148
-1.0 -1.0 -1.0 0.47313094
0.33148524 0.6864973 1.0 0.98801696
0.7784256 -1.0 1.0 0.54930246
0.67836744 -1.0 1.0 -0.74228466
-1.0 -0.16157359 -1.0 -0.28723598
1.0 -0.41904545 1.0 0.69414103
-1.0 -1.0 -1.0 -0.72039497
1.0 -0.36208054 1.0 0.93885016
1.0 1.0 1.0 -0.9164482
1.0 -0.7852948 1.0 -0.93368316
1.0 0.92832744 1.0 0.9125788
1.0 0.8330672 1.0 0.99116135
0.27341795 -0.66464627 1.0 0.9829724
1.0 -1.0 -1.0 -0.9784988
1.0 -0.42661956 -1.0 -0.9376769
-0.33614743 1.0 -1.0 0.97392154
-1.0 1.0 -1.0 0.95963097
-1.0 0.5701276 -1.0 -0.83208144
1.0 -1.0 -1.0 0.9852835
-0.03183016 1.0 1.0 -0.44535422
1.0 0.93954366 -1.0 -0.9785353
1.0 1.0 1.0 0.11844778
0.45565134 0.09385806 1.0 -0.9783454
-1.0 -1.0 1.0 -0.9850417
rewards -0.774691559246066
turbulence 26.459999084472656
trade: 967
cost: 2238.4322658710494
-1.0 -1.0 -1.0 0.97490716
-1.0 0.24457896 -1.0 0.86044014
-1.0 1.0 1.0 -0.43097794
-1.0 -0.78463876 -1.0 0.98604774
-0.3033314 -0.20791337 1.0 0.7642555
-0.75285625 -0.9769033 -1.0 0.54353046
0.3840992 -0.31341544 1.0 0.9251652
0.7505071 0.8979338 1.0 0.83321047
0.57704055 0.7082601 1.0 -0.9114633
-1.0 -0.028822422 -1.0 -0.8741359
1.0 0.6926125 1.0 0.42621648
-1.0 0.65907305 -1.0 -0.914631
0.794164 0.39445668 1.0 0.82596564
```

```
1.0 1.0 1.0 -0.92181987
1.0 -0.13981518 1.0 -0.99739456
1.0 1.0 1.0 0.748595
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-0.66861296 1.0 1.0 0.818352
1.0 -1.0 -1.0 -0.9095476
1.0 1.0 -1.0 -0.9950267
-1.0 -0.7687545 -1.0 0.9903996
0.7132331 -1.0 -1.0 0.9602171
-1.0 -0.33584464 -1.0 -0.90850186
1.0 -0.5030654 -1.0 0.9079608
0.22775555 -1.0 1.0 -0.9176169
1.0 1.0 -1.0 -0.8454906
1.0 1.0 1.0 -0.2423197
-0.30716252 1.0 1.0 -0.93444145
0.065918446 -0.1164422 1.0 -0.98408854
rewards -1.5659351652702318
turbulence 25.82999992370605
trade: 986
cost: 2276.2021390934015
-0.6699297 1.0 -1.0 0.94108284
-0.7978451 0.8870019 -1.0 0.96116614
-0.8838143 1.0 1.0 -0.13184065
-1.0 -0.6587188 -1.0 0.9792764
0.89987516 -0.64258075 1.0 0.12780714
-0.83367956 -0.16256194 -1.0 0.97063065
-0.27398205 0.4864285 1.0 0.86729395
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-0.21419194 0.6743343 1.0 -0.98922837
-1.0 -1.0 -1.0 -0.85203123
1.0 0.6717775 1.0 0.5860175
-1.0 -0.52247393 -1.0 -0.9847859
1.0 0.13360956 1.0 0.97600913
1.0 0.97689193 1.0 -0.8905715
1.0 0.38567418 1.0 -0.98844993
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1.0 -1.0 1.0 0.99335146
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-0.73080266 -0.29920632 1.0 -0.88886833
1.0 0.2710934 -1.0 -0.8528471
1.0 1.0 1.0 0.27691913
-0.30283594 -1.0 1.0 -0.954595
```

```
-1.0 1.0 1.0 -0.95095694
rewards -1.1248418006465888
turbulence 27.780000686645508
trade: 1003
cost: 2287.6491219997424
-0.98914415 -1.0 -1.0 0.96764946
-1.0 -0.42830575 -1.0 0.8228955
-1.0 0.5222045 1.0 -0.6967025
-1.0 -0.20007852 -1.0 0.96589744
0.09120468 0.1394799 1.0 0.79093754
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1.0 -0.57592976 1.0 -0.6115785
0.13983396 -1.0 1.0 -0.9685985
-1.0 -1.0 -1.0 -0.9218647
1.0 0.7667709 1.0 0.81528556
-1.0 1.0 -1.0 -0.8207151
0.6970045 -1.0 1.0 0.46264064
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1.0 1.0 1.0 0.61403215
1.0 -0.42617399 1.0 0.97719026
1.0 -1.0 1.0 0.95820045
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1.0 -1.0 -1.0 -0.79638374
1.0 1.0 1.0 0.4985664
-0.13181752 1.0 1.0 -0.8389838
-0.41056788 -0.48527747 1.0 -0.85459
rewards 1.1736946657062508
turbulence 26.86000061035156
trade: 1019
cost: 2312.6922301044488
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-1.0 0.8252144 -1.0 0.8415873
-1.0 1.0 1.0 -0.76768667
-0.14812493 -1.0 -1.0 0.93574023
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-1.0 -1.0 -1.0 0.023902297
```

```
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1.0 -1.0 1.0 0.9138229
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1.0 -0.19130969 -1.0 0.95895314
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1.0 1.0 1.0 0.22263539
-1.0 0.4518215 1.0 -0.9928926
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rewards -1.2598379301334384
turbulence 28.57999992370605
trade: 1035
cost: 2321.3360234737415
-1.0 -0.6028957 -1.0 0.97710955
-1.0 1.0 -1.0 0.93211293
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-1.0 1.0 -1.0 0.94475317
1.0 1.0 1.0 0.9879818
-1.0 1.0 -1.0 0.93596303
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1.0 0.27696863 1.0 -0.50765604
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1.0 0.4346532 1.0 -0.38332927
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0.9174434 -1.0 1.0 -0.113562584
1.0 -1.0 1.0 -0.98801404
1.0 0.7227147 1.0 -0.6353049
1.0 1.0 1.0 0.30627167
1.0 -0.8888014 1.0 0.9680662
0.14573443 0.15699567 1.0 0.9449301
1.0 -1.0 -1.0 -0.9568636
1.0 -1.0 -1.0 -0.9922142
-0.6751766 1.0 -1.0 0.9858732
0.23979829 0.1022892 -1.0 0.9361938
-1.0 1.0 -1.0 -0.98674726
1.0 -0.73829347 -1.0 0.9915545
-0.71711624 -1.0 1.0 -0.69530106
```

```
1.0 0.07043717 -1.0 -0.84075654
1.0 1.0 1.0 0.63614726
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-1.0 -1.0 1.0 -0.8496387
rewards -0.09025597886313917
turbulence 28.51000022888184
trade: 1053
cost: 2327.6874647846244
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0.02164191 0.42393953 1.0 -0.77636725
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1.0 0.8928959 1.0 0.30955577
1.0 0.6174581 1.0 -0.9728624
-1.0 -0.7437682 1.0 -0.92246294
rewards 1.592902855375677
turbulence 26.3799991607666
trade: 1073
cost: 2345.4083960437797
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-1.0 -0.71892387 -1.0 0.8984966
-1.0 -1.0 1.0 -0.9350877
-1.0 0.60567766 -1.0 0.99472857
-0.056515492 -1.0 1.0 0.7710202
-0.8042873 -0.33369344 -1.0 0.9627826
1.0 -0.38010928 1.0 0.9853058
```

```
0.7694679 -0.4718864 1.0 -0.90182114
0.32779473 0.35739455 1.0 -0.959142
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-1.0 0.103087574 -1.0 -0.77407235
0.7572693 0.29069585 1.0 0.5422411
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0.81044304 -0.2262798 1.0 0.79007554
0.95320845 -0.35007066 1.0 0.9901794
1.0 1.0 1.0 0.96574533
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1.0 0.5471186 -1.0 -0.38727385
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-0.4608772 1.0 1.0 -0.82915676
-1.0 1.0 1.0 -0.8993492
rewards 1.8550708332321142
turbulence 26.190000534057617
trade: 1088
cost: 2361.8811092548394
-1.0 -1.0 -1.0 0.9152038
-1.0 -0.06771666 -1.0 0.15540981
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0.10599801 -0.34393013 1.0 0.813326
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1.0 0.04890719 1.0 0.9097434
1.0 -1.0 -1.0 -0.89094824
1.0 0.35369325 -1.0 -0.8914243
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-0.31307077 -0.8075315 -1.0 0.9332211
```

```
-1.0 -1.0 -1.0 -0.94330394
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1.0 -1.0 -1.0 -0.6481238
1.0 1.0 1.0 0.6600257
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rewards -0.6963096968246392
turbulence 26.270000457763672
trade: 1103
cost: 2398.2641721668265
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0.4197232 -1.0 1.0 -0.8428735
-1.0 -1.0 -1.0 0.35594714
1.0 1.0 0.8463725 0.45553684
-1.0 -1.0 -1.0 -0.9608918
1.0 -0.5524495 1.0 0.9036641
1.0 -0.71624565 1.0 -0.93671066
1.0 -1.0 1.0 -0.9119896
1.0 -0.6145966 1.0 0.9500141
1.0 -1.0 1.0 0.9802288
-0.0153592825 -1.0 1.0 0.9760101
1.0 -1.0 -1.0 -0.9440657
1.0 0.12714167 -1.0 -0.8065459
1.0 0.46753383 -1.0 0.9398167
-0.65734315 0.16112055 -1.0 0.82423854
-1.0 -0.09799519 -1.0 -0.97650236
1.0 0.8731936 -1.0 0.98618674
-1.0 0.726635 1.0 -0.9652787
1.0 0.00076049566 -1.0 -0.99080414
1.0 -1.0 1.0 0.93640184
0.8290832 -0.3453361 1.0 -0.99244875
-1.0 -0.511015 1.0 -0.98911905
rewards 0.9256721484657144
turbulence 26.3700008392334
trade: 1119
cost: 2433.7186480503105
-0.40950608 1.0 -1.0 0.8748448
-1.0 -0.35283658 -1.0 0.8974787
-1.0 -1.0 1.0 -0.14259732
-1.0 -0.7238871 -1.0 0.9804206
```

```
-1.0 0.5624584 1.0 0.92306423
0.4078747 1.0 -1.0 0.59808254
1.0 0.28290087 1.0 0.9243834
1.0 -1.0 1.0 0.852339
1.0 -1.0 1.0 -0.9371767
-1.0 -0.21576016 -1.0 -0.95538944
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1.0 1.0 1.0 0.7701827
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1.0 -0.62945473 1.0 -0.87157685
1.0 -0.20937759 1.0 0.42445898
1.0 -1.0 1.0 0.99092436
1.0 -0.34085098 1.0 0.9410739
1.0 0.40350443 -1.0 -0.9255622
1.0 0.989277 -1.0 -0.9916244
-0.29774478 1.0 -1.0 0.98440707
0.48195383 1.0 -1.0 0.97333825
-1.0 0.9340026 -1.0 -0.97550803
1.0 0.90886885 -1.0 0.9804752
0.846248 -0.40533483 1.0 -0.43462002
1.0 -0.6982126 -1.0 -0.9022531
1.0 -1.0 1.0 0.7271249
-1.0 -0.26266426 1.0 -0.94035834
-1.0 -0.70926857 1.0 -0.9216471
rewards 0.3338984436889645
turbulence 26.700000762939453
trade: 1135
cost: 2447.7528001804376
-1.0 0.86651003 -1.0 0.89415014
-1.0 -0.7531559 -1.0 0.77097964
-1.0 -1.0 1.0 -0.6195085
-1.0 -0.6226553 -1.0 0.83762777
0.87850296 0.9891379 1.0 0.9376253
-1.0 0.6563443 -1.0 0.8083155
1.0 0.2467462 1.0 0.9232929
0.6772181 -0.81921184 1.0 -0.95433825
1.0 1.0 1.0 -0.88786894
-1.0 0.09456739 -1.0 0.33414245
1.0 1.0 1.0 0.5999534
-1.0 1.0 -1.0 -0.9890489
1.0 -1.0 1.0 0.5503782
1.0 1.0 1.0 -0.94796544
1.0 -0.027893618 1.0 -0.9019494
1.0 0.23394099 1.0 0.875111
1.0 0.30845252 1.0 0.97154784
1.0 0.24515979 1.0 0.9780693
1.0 0.44942144 -1.0 -0.8057853
```

```
1.0 1.0 -1.0 -0.8589477
1.0 -1.0 -1.0 0.96996343
0.72408485 -0.5287861 -1.0 0.97574425
-1.0 0.35001957 -1.0 -0.985584
1.0 -0.74125636 -1.0 0.9764199
0.947676 1.0 1.0 -0.66811085
1.0 0.33510083 -1.0 -0.320583
1.0 1.0 1.0 0.047297597
-1.0 0.6831472 1.0 -0.8759207
-1.0 -0.124445975 1.0 -0.97791255
rewards -0.5946315974899335
turbulence 27.6299991607666
trade: 1154
cost: 2465.966480157854
-0.85392964 -0.96045613 -1.0 0.9354439
-1.0 1.0 -1.0 0.3745699
-0.81704867 -1.0 1.0 0.015508413
-1.0 0.5996493 -1.0 0.92575645
0.18927091 -0.3363434 1.0 0.77282405
-1.0 0.5029037 -1.0 0.90401363
-1.0 0.27181962 1.0 0.96920574
1.0 0.32065833 1.0 -0.12619352
1.0 -0.05965111 1.0 -0.8976495
-1.0 0.45900422 -1.0 -0.46400392
1.0 -1.0 1.0 0.86114836
-1.0 0.5338279 -1.0 -0.9032248
1.0 1.0 1.0 -0.7462994
1.0 0.2837226 1.0 -0.9860588
1.0 -1.0 1.0 -0.91262615
1.0 -0.3529451 1.0 0.73720837
0.15888238 -0.5268506 1.0 0.93099475
0.8471124 1.0 1.0 0.8696339
1.0 0.1678833 -1.0 -0.9631917
1.0 -0.026240662 -1.0 -0.7497502
1.0 1.0 -1.0 0.9889991
-1.0 0.89383256 -1.0 0.98728967
-1.0 -1.0 -1.0 -0.579352
1.0 -1.0 -1.0 0.9191055
-0.8509369 0.0543378 1.0 -0.95719975
1.0 1.0 -1.0 -0.8731801
1.0 0.16992988 1.0 0.9296329
-0.27454257 1.0 1.0 -0.9960618
-1.0 -1.0 1.0 -0.97712636
rewards 2.297619500665297
turbulence 27.959999084472656
trade: 1172
cost: 2472.158608057024
-0.07470322 -0.9323037 -1.0 0.9187958
```

```
-1.0 0.16386262 -1.0 0.60255766
-0.9228797 0.6800077 1.0 -0.866518
-1.0 -0.3400368 -1.0 0.9770106
0.23816831 -0.04658307 1.0 0.8393661
-0.80010635 1.0 -1.0 0.80790305
1.0 0.601221 1.0 0.87989116
0.26046693 1.0 1.0 -0.07808626
-0.41585428 1.0 1.0 -0.79323065
-1.0 -0.45367226 -1.0 -0.50463104
1.0 -0.41565228 1.0 0.077983856
-1.0 -1.0 -1.0 -0.9404724
1.0 1.0 1.0 0.44008148
1.0 0.41167 1.0 -0.9935983
1.0 -1.0 1.0 -0.91152203
1.0 -0.72904944 1.0 0.87535644
1.0 -0.15117621 1.0 0.9566109
1.0 1.0 1.0 0.8712791
1.0 0.045339957 -1.0 -0.8997777
1.0 0.2820018 -1.0 -0.8961455
-0.06917657 0.6695427 -1.0 0.9362744
-0.24942218 0.96417725 -1.0 0.9756762
-1.0 1.0 -1.0 -0.75048417
1.0 1.0 -1.0 0.9795954
0.65231603 -0.55726874 1.0 -0.8808079
1.0 -0.54642725 -1.0 -0.88671017
1.0 1.0 1.0 0.78282547
-1.0 1.0 1.0 -0.9568925
-0.27847266 -0.78322333 1.0 -0.9647552
rewards -1.6872829900241924
turbulence 29.479999542236328
trade: 1189
cost: 2482.684362485888
-1.0 0.56849104 -1.0 0.9535265
-1.0 -1.0 -1.0 0.8206091
-0.23461437 -0.8471944 1.0 -0.9893918
-0.44755828 -0.5871471 -1.0 0.98901725
-1.0 -0.676814 1.0 0.8501408
-0.72447264 0.68075573 -1.0 0.81671953
0.33990234 0.3869242 1.0 0.9236909
1.0 1.0 1.0 -0.450967
0.5579253 -1.0 1.0 -0.9786697
-1.0 0.97173923 -1.0 0.19560611
1.0 1.0 1.0 -0.7816663
-0.6439905 1.0 -1.0 -0.7240559
1.0 -1.0 1.0 -0.5992006
1.0 -0.8193692 1.0 -0.9922063
1.0 -1.0 1.0 -0.9685568
0.7790121 0.74112487 1.0 0.92965543
```

```
0.549597 -0.3335327 1.0 0.96915936
1.0 -0.66012746 1.0 0.9653063
1.0 -1.0 -1.0 -0.9696587
1.0 1.0 -1.0 -0.7433318
-0.18409541 1.0 -1.0 0.97680354
0.56782234 0.3853674 -1.0 0.96745014
-1.0 -0.44364795 -1.0 -0.8535488
1.0 0.52709764 -1.0 0.976707
-1.0 1.0 1.0 -0.7587551
1.0 0.22672671 -1.0 -0.9405039
1.0 0.6339553 1.0 0.8883481
-1.0 -1.0 1.0 -0.9786089
-1.0 -1.0 1.0 -0.97909534
rewards 2.1592198819862447
turbulence 28.059999465942383
trade: 1207
cost: 2509.7072451992058
-0.5407317 0.95442414 -1.0 0.82605076
-1.0 -0.22649765 -1.0 -0.349886
-1.0 1.0 1.0 0.47984552
-1.0 -0.4027698 -1.0 0.97355235
-0.5145603 -0.48447433 1.0 0.9112259
-0.37606776 1.0 -1.0 0.90890837
1.0 -1.0 1.0 0.85136986
0.67169 1.0 1.0 -0.7842286
1.0 0.15834033 1.0 -0.94465274
-1.0 1.0 -1.0 -0.74141973
1.0 -1.0 1.0 0.72276795
-1.0 -1.0 -1.0 -0.9914427
1.0 0.90488064 1.0 0.5870719
1.0 -0.48775405 1.0 -0.97808766
1.0 0.6161261 1.0 -0.8782113
0.3132727 1.0 1.0 0.6755254
1.0 1.0 1.0 0.9940145
1.0 -0.64658415 1.0 0.9170424
1.0 0.9474197 -1.0 -0.92353964
1.0 0.107133895 -1.0 -0.9553971
-0.51615834 -0.39472598 -1.0 0.9969733
-1.0 -1.0 -1.0 0.98738253
-1.0 -0.026878804 -1.0 -0.95103586
1.0 0.23512504 -1.0 0.9970851
-0.722494 -1.0 1.0 -0.8976927
1.0 1.0 -1.0 -0.98143834
1.0 -1.0 1.0 0.97476363
-0.30209076 1.0 1.0 -0.99142325
-1.0 1.0 1.0 -0.96712685
rewards 0.6650697447860614
turbulence 26.36000061035156
```

```
trade: 1226
cost: 2532.4862415828725
-1.0 0.8998745 -1.0 0.98188686
-1.0 -0.40970322 -1.0 0.9644586
-1.0 0.14705537 1.0 -0.83976364
-1.0 -0.6885742 -1.0 0.9962311
0.16124874 -0.6893309 1.0 0.9526489
-1.0 -0.0065491945 -1.0 0.5520172
0.60288554 0.87125057 1.0 0.86312246
0.15289783 1.0 1.0 -0.2218436
1.0 -0.16469064 1.0 -0.9065117
-1.0 -1.0 -1.0 -0.6315034
1.0 1.0 1.0 -0.85875577
-1.0 1.0 -1.0 -0.6358434
0.45806897 0.13810135 1.0 -0.9062759
1.0 0.35561565 1.0 -0.9343126
1.0 -0.66335833 1.0 -0.9635471
1.0 1.0 1.0 0.8012328
1.0 0.51796985 1.0 0.9744222
1.0 -1.0 1.0 0.9865732
1.0 -1.0 -1.0 -0.97508967
1.0 -1.0 -1.0 -0.95431733
-0.6836896 1.0 -1.0 0.9575871
0.35671386 1.0 -1.0 0.9277376
-1.0 -1.0 -1.0 -0.8566196
1.0 -0.14423868 -1.0 0.977103
-1.0 1.0 1.0 -0.6727631
1.0 -1.0 -1.0 -0.8164753
1.0 -1.0 1.0 0.81877863
0.65438724 1.0 1.0 -0.97992593
-1.0 0.15598613 1.0 -0.9639369
rewards 0.9619198456188198
turbulence 25.0
trade: 1244
cost: 2549.966069086077
-0.19702429 -0.2232024 -1.0 0.75768304
-1.0 -0.23724823 -1.0 0.8808149
-1.0 1.0 1.0 -0.91752
-1.0 0.8148618 -1.0 0.96623945
-0.92834055 0.3315246 1.0 0.6541072
-1.0 0.17359725 -1.0 0.8465681
1.0 1.0 1.0 0.9243139
1.0 1.0 1.0 -0.51132345
-0.40134123 -0.6065234 1.0 -0.9036615
-1.0 -1.0 -1.0 -0.92353237
1.0 0.115704894 1.0 -0.11921662
-1.0 1.0 -1.0 -0.8078904
0.92266417 -0.06777121 1.0 0.6698482
```

```
1.0 -0.6492798 1.0 -0.99325246
1.0 0.8411205 1.0 -0.93976045
1.0 -1.0 1.0 0.8214966
0.4467094 0.78987813 1.0 0.98122215
1.0 -0.7101638 1.0 0.41283214
1.0 -0.2748001 -1.0 -0.9826411
1.0 0.31599742 -1.0 -0.8101717
0.43891633 -1.0 -1.0 0.9898863
0.5529848 -0.8788688 -1.0 0.9323057
-0.61109066 -0.48589873 -1.0 -0.9562974
1.0 -1.0 -1.0 0.9784665
-1.0 -1.0 1.0 -0.6518028
0.60771346 -1.0 -1.0 -0.8501502
1.0 -1.0 1.0 0.7046888
-0.9729193 1.0 1.0 -0.97556895
-1.0 -0.45948988 1.0 -0.91427714
rewards 1.7512535610637627
turbulence 25.06999969482422
trade: 1262
cost: 2557.251514814379
-1.0 0.08353779 -1.0 0.7449068
-1.0 1.0 -1.0 0.8437207
-1.0 -0.41504908 1.0 -0.9199694
0.3676356 -1.0 -1.0 0.9568727
0.66387707 0.3767738 1.0 0.67962146
-0.34290242 -1.0 -1.0 0.57854044
0.9800279 1.0 1.0 0.98106825
1.0 0.5363851 1.0 -0.7723405
1.0 -0.8754598 1.0 -0.9190373
-1.0 -1.0 -1.0 0.5485234
0.8048582 -0.64025545 1.0 -0.22329408
-1.0 1.0 -1.0 -0.9656935
1.0 1.0 1.0 0.31021202
1.0 0.82112813 1.0 -0.9778519
1.0 -1.0 1.0 -0.9266612
1.0 -0.25237703 1.0 0.8710984
0.77630806 -0.51930285 1.0 0.9767716
1.0 0.39153686 1.0 0.85369194
0.85145324 -1.0 -1.0 -0.88862574
1.0 -0.8280691 -1.0 -0.70319116
0.40485582 -1.0 -1.0 0.98808956
-1.0 -0.02050107 -1.0 0.7501519
-1.0 0.43979582 -1.0 -0.9679272
1.0 -0.0897024 -1.0 0.9748099
1.0 -1.0 1.0 -0.8287813
1.0 0.11109514 -1.0 -0.93272656
1.0 -1.0 1.0 0.77662766
0.34451473 0.95560884 1.0 -0.8730753
```

```
0.845978 0.38081408 1.0 -0.9126574
rewards -1.4825155680831756
turbulence 26.06999969482422
trade: 1280
cost: 2573.4276195354482
0.5107777 0.2836135 -1.0 0.9443202
-0.8810128 -0.35826078 -1.0 -0.371952
-1.0 0.24178514 1.0 -0.5264214
-1.0 -0.56209207 -1.0 0.983402
-0.9818469 -1.0 1.0 0.5482323
-1.0 0.5638577 -1.0 0.81984544
1.0 1.0 1.0 0.95816946
1.0 0.19906378 1.0 -0.7802238
-0.31009448 -0.6168017 1.0 -0.90035534
-1.0 -1.0 -1.0 -0.18652219
1.0 1.0 1.0 0.97123885
-1.0 -0.17064054 -1.0 -0.95178735
1.0 -1.0 1.0 0.9850955
1.0 0.28561023 1.0 -0.94090986
1.0 0.848439 1.0 -0.97220325
1.0 1.0 1.0 0.5549922
1.0 -0.63660246 1.0 0.99017334
1.0 -0.8529848 1.0 0.91031075
0.93503886 -1.0 -1.0 -0.9862795
1.0 0.95358944 -1.0 -0.8404598
0.23601086 -1.0 -1.0 0.92883134
-0.99098617 0.23406184 -1.0 0.95399
-1.0 -1.0 -1.0 -0.88453937
1.0 -1.0 -1.0 0.9849597
0.59464806 -0.21689814 1.0 -0.8986313
1.0 -0.3938747 -1.0 -0.7705317
1.0 -1.0 1.0 0.084627986
-0.76016486 -0.38138014 1.0 -0.83867246
-1.0 1.0 1.0 -0.9242362
rewards -0.4295580386749236
turbulence 26.399999618530277
trade: 1298
cost: 2584.3944427471183
-0.6812295 1.0 -1.0 0.70347095
-1.0 0.70754826 -1.0 0.48600507
-0.61405754 -0.80579436 1.0 -0.15776491
-1.0 -0.39621043 -1.0 0.8862678
1.0 1.0 1.0 0.70817053
0.12761426 -1.0 -1.0 0.9730909
1.0 0.6824524 1.0 0.9867561
0.4975412 -1.0 1.0 -0.67497134
0.6597474 0.5061471 1.0 -0.96455956
-1.0 -1.0 -1.0 -0.8114289
```

```
1.0 -0.13509586 1.0 0.7035105
-1.0 1.0 -1.0 -0.9564082
1.0 -1.0 1.0 0.87096393
1.0 1.0 1.0 -0.99155414
1.0 0.8181213 1.0 -0.8809228
1.0 -0.70376986 1.0 0.7672944
1.0 0.3403231 1.0 0.9940382
0.87103885 -0.5269892 1.0 0.8914833
1.0 0.28050455 -1.0 -0.9333834
1.0 1.0 -1.0 -0.9484556
1.0 0.49201232 -1.0 0.9959891
-0.071449816 1.0 -1.0 0.9901011
-1.0 -1.0 -1.0 -0.8084641
1.0 1.0 -1.0 0.9772184
-1.0 -1.0 1.0 -0.9929852
1.0 1.0 -1.0 -0.95186406
1.0 0.81630135 1.0 0.3435762
-1.0 0.15598258 1.0 -0.89141756
-1.0 -0.13924223 1.0 -0.99253994
rewards 0.3559787629356375
turbulence 26.96999931335449
trade: 1317
cost: 2589.6465854244257
-0.61080074 0.58769107 -1.0 0.8756769
-1.0 -0.8102721 -1.0 0.8927295
-0.31490922 0.05630955 1.0 -0.9522539
-1.0 -1.0 -1.0 0.9917635
0.63896036 1.0 1.0 0.49994802
-0.1461463 -0.90800583 -1.0 0.9494592
0.9202916 -0.31928796 1.0 0.8786266
1.0 -0.40596625 1.0 -0.7266512
1.0 -1.0 1.0 -0.40110832
-1.0 -1.0 -1.0 -0.85548383
1.0 0.8192252 1.0 -0.6774631
-1.0 1.0 -1.0 -0.98721665
0.22496068 -1.0 1.0 0.8478422
1.0 0.44073245 1.0 -0.94954073
1.0 0.042616323 1.0 -0.9241741
1.0 1.0 1.0 0.19383049
-0.15817773 -1.0 1.0 0.98320556
1.0 0.25911856 1.0 0.94050646
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1.0 -0.5860761 -1.0 -0.95049685
-0.11083239 0.7302215 -1.0 0.997862
0.26114547 -0.5032111 -1.0 0.96400905
-1.0 0.028798997 -1.0 -0.98569125
1.0 -1.0 -1.0 0.94410074
-1.0 1.0 1.0 -0.85991997
```

```
1.0 -1.0 -1.0 -0.88874555
1.0 0.077047706 1.0 -0.0022325516
0.9703865 -1.0 1.0 -0.97149026
-1.0 0.8114558 1.0 -0.87176454
rewards 0.20443566692199094
turbulence 27.40999984741211
trade: 1334
cost: 2623.037432836535
-0.67363036 -0.6602081 -1.0 0.9966655
-1.0 0.53997177 -1.0 0.90513635
-1.0 1.0 1.0 -0.48201764
-0.65638626 0.7893424 -1.0 0.96274436
-0.17446432 -1.0 1.0 0.85921836
0.3306514 1.0 -1.0 0.87781453
-1.0 1.0 1.0 0.96648335
0.7339907 0.017302856 1.0 -0.14703858
1.0 -0.3284459 1.0 -0.30983365
-1.0 0.65035564 -1.0 -0.12418157
1.0 -0.2281875 1.0 0.89825416
-1.0 -1.0 -1.0 -0.863647
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1.0 -0.64614934 1.0 -0.93185914
1.0 0.11561291 1.0 -0.7024814
1.0 0.11251111 1.0 0.9373281
0.7328421 0.7895156 1.0 0.98023105
1.0 1.0 1.0 0.9732524
1.0 0.6888318 -1.0 -0.9872873
1.0 -0.7457401 -1.0 -0.87661225
1.0 -0.07957231 -1.0 0.98656094
-0.38287455 -1.0 -1.0 0.99130464
-1.0 -0.8916229 -1.0 -0.9581335
1.0 0.3759515 -1.0 0.95495176
-0.2186225 1.0 1.0 -0.5792317
1.0 0.6849135 -1.0 -0.8353502
1.0 1.0 1.0 0.8068956
0.72462255 1.0 1.0 -0.9618251
-1.0 0.46937642 1.0 -0.9805512
rewards -1.6188168342567515
turbulence 29.18000030517578
trade: 1352
cost: 2634.458430433276
-1.0 -0.037236676 -1.0 0.6069207
-1.0 0.32083786 -1.0 0.22880173
-1.0 -1.0 1.0 -0.744826
-0.63134575 1.0 -1.0 0.9820454
-0.4349963 -0.2620308 1.0 0.8908206
-0.08845556 -1.0 -1.0 0.84678674
1.0 -0.049018756 1.0 0.9128845
```

```
0.406798 -0.04785545 1.0 0.16880059
-1.0 -0.28891554 1.0 -0.99378747
-1.0 0.037973687 -1.0 -0.37206435
1.0 -0.37351727 1.0 -0.36950767
-1.0 -0.8340653 -1.0 -0.94518566
0.9906969 0.3647816 1.0 0.8694248
1.0 -1.0 1.0 -0.7955769
1.0 1.0 1.0 -0.97154623
1.0 1.0 1.0 0.7665415
1.0 -0.64067024 1.0 0.97608256
1.0 1.0 1.0 0.8162012
0.59787965 -0.3808573 -1.0 -0.96784866
1.0 0.35186884 -1.0 -0.5874319
1.0 1.0 -1.0 0.9408097
1.0 0.85549974 -1.0 0.81820273
-1.0 0.13360897 -1.0 -0.97261393
1.0 0.7794503 -1.0 0.9947281
-1.0 0.09385429 1.0 -0.8750627
1.0 -1.0 -1.0 -0.9648596
1.0 1.0 1.0 0.9022825
0.48773515 0.03963226 1.0 -0.9831837
-1.0 -0.2500617 1.0 -0.97469515
rewards 1.7798655823135516
turbulence 29.350000381469727
trade: 1369
cost: 2649.288424253467
-1.0 0.122782946 -1.0 0.91617584
-1.0 -0.48410007 -1.0 0.13564253
-1.0 0.13788424 1.0 -0.37521458
-1.0 -1.0 -1.0 0.94589615
-0.39357445 -1.0 1.0 0.9055531
-1.0 0.6264497 -1.0 0.8344002
1.0 1.0 1.0 0.9829011
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-1.0 1.0 -1.0 -0.47848845
1.0 0.37464786 1.0 0.84115696
-1.0 -0.3320963 -1.0 -0.9845573
0.8217111 0.6589201 1.0 0.90368104
1.0 0.2106693 1.0 -0.9589063
1.0 -0.8972981 1.0 -0.91447866
1.0 0.37385428 1.0 0.59138227
1.0 -1.0 1.0 0.9799869
0.47603166 -1.0 1.0 0.96528935
1.0 0.45049274 -1.0 -0.97625655
1.0 -1.0 -1.0 -0.9654396
0.834332 -1.0 -1.0 0.76615596
-0.40748674 1.0 -1.0 0.9844372
```

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-1.0 -0.76461613 -1.0 -0.90074205
1.0 1.0 -1.0 0.9846914
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1.0 -0.51167536 1.0 0.8083637
0.8362604 1.0 1.0 -0.9895281
-1.0 -0.18166408 1.0 -0.9648173
rewards 1.0259708058807302
turbulence 28.649999618530277
trade: 1386
cost: 2666.4552815227535
-1.0 0.79401493 -1.0 0.9603622
-1.0 -0.37694442 -1.0 -0.071031034
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-1.0 -0.59403896 -1.0 0.9800582
-0.05864332 1.0 1.0 0.934113
-1.0 0.2692318 -1.0 0.9962642
1.0 0.3040278 1.0 0.94441664
0.09230065 -1.0 1.0 -0.050549567
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-1.0 -0.32213157 -1.0 -0.83755696
1.0 1.0 1.0 0.26793218
-1.0 0.67822766 -1.0 -0.99618196
-0.8126526 1.0 1.0 0.95863175
1.0 0.58195674 1.0 -0.9473022
1.0 -0.09654324 1.0 -0.7841541
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0.8645759 0.4531159 1.0 0.9944086
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1.0 -1.0 1.0 0.33247995
1.0 0.03708458 1.0 -0.98858553
-1.0 -1.0 1.0 -0.9698164
rewards 0.7201162917159963
turbulence 28.11000061035156
trade: 1403
cost: 2694.7577040233646
-1.0 0.56736296 -1.0 0.9691131
0.55206656 0.14861211 -1.0 0.18265986
-1.0 -1.0 1.0 -0.61839163
-1.0 1.0 -1.0 0.89190483
```

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-1.0 -1.0 1.0 0.7540691
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1.0 0.56493264 1.0 -0.99416965
-1.0 0.29395378 -1.0 -0.6507373
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-1.0 -1.0 -1.0 -0.98728716
1.0 -0.9999382 1.0 0.5217631
1.0 0.7784747 1.0 -0.94304883
1.0 0.7910504 1.0 -0.91781
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1.0 0.33069906 1.0 0.71180737
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0.8488698 1.0 -1.0 0.96720207
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-1.0 -1.0 -1.0 -0.79754025
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1.0 0.76193446 1.0 0.8288195
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rewards -0.034688732303236616
turbulence 27.549999237060547
trade: 1422
cost: 2694.8586195850403
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-1.0 0.7923613 -1.0 0.8559443
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```
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-1.0 0.8525419 -1.0 -0.7906085
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-0.48542333 0.075263694 1.0 -0.35227537
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1.0 0.5554477 1.0 -0.49422324
-0.7662101 -0.05892843 1.0 -0.97717345
-1.0 -1.0 1.0 -0.9451074
rewards -2.7113708496932873
turbulence 32.459999084472656
trade: 1441
cost: 2711.687393922809
-0.13713706 -0.9837384 -1.0 0.9085233
-1.0 0.424338 -1.0 0.8952491
-1.0 -0.35654142 1.0 -0.91935706
-1.0 -1.0 -1.0 0.90510535
0.39845017 -1.0 1.0 0.9891989
-1.0 -1.0 -1.0 0.81972754
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-1.0 1.0 -1.0 -0.9486242
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1.0 0.9321038 1.0 -0.9931053
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1.0 1.0 1.0 0.9536874
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1.0 0.3987942 -1.0 -0.80965656
1.0 1.0 -1.0 -0.98221743
-1.0 -1.0 -1.0 0.95838976
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-1.0 -1.0 -1.0 -0.9797497
1.0 -0.3590937 -1.0 0.9713024
-1.0 1.0 1.0 -0.9734345
0.8390212 1.0 -1.0 -0.85659385
1.0 0.44256407 1.0 0.069057226
-1.0 -0.027487516 1.0 -0.8553997
-0.1046617 -1.0 1.0 -0.94615173
rewards -0.8512108218834037
turbulence 33.349998474121094
trade: 1458
cost: 2753.9628643436467
-0.9777991 -1.0 -1.0 0.9654958
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```
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-1.0 -0.024858832 1.0 -0.911365
rewards -3.2089342812519055
turbulence 40.27999877929688
trade: 1477
cost: 2776.4373487682383
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-1.0 -1.0 -1.0 0.61976385
-1.0 -1.0 1.0 0.35159636
-1.0 -1.0 -1.0 0.9665446
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-1.0 -1.0 -1.0 -0.7491102
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-1.0 1.0 -1.0 -0.89428204
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1.0 1.0 1.0 -0.98037595
1.0 -1.0 1.0 -0.93001175
0.9657159 -1.0 1.0 0.7306119
```

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1.0 0.97166634 1.0 0.97821736
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1.0 0.96181166 -1.0 0.892349
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-1.0 -1.0 -1.0 -0.9493266
1.0 -1.0 -1.0 0.93639815
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1.0 -1.0 1.0 0.9499233
-0.26154605 0.7956432 1.0 -0.944241
-1.0 0.16929808 1.0 -0.9936356
rewards 1.263432419852447
turbulence 37.59000015258789
trade: 1494
cost: 2807.9774500179333
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-1.0 0.83233064 -1.0 -0.009718478
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1.0 0.67141956 1.0 0.9512023
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1.0 1.0 -1.0 -0.9947159
0.746333 1.0 -1.0 0.99802303
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-1.0 0.067266256 -1.0 -0.9818271
1.0 1.0 -1.0 0.98427725
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0.83060336 -1.0 -1.0 -0.6767436
1.0 0.63733923 1.0 0.9801563
0.111815155 -1.0 1.0 -0.9124439
-1.0 1.0 1.0 -0.97057486
rewards -1.5608965639556758
turbulence 38.02000045776367
```

```
trade: 1513
cost: 2825.380322546009
-1.0 -0.07535511 -1.0 0.7990422
-0.22131908 -0.98054975 -1.0 0.8554065
-1.0 0.7447559 1.0 -0.53270215
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-1.0 1.0 -1.0 0.90126204
1.0 0.39219528 1.0 0.9261025
1.0 0.38302758 1.0 0.25364685
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0.19610989 -0.50693274 1.0 0.70875096
1.0 1.0 1.0 -0.97959393
1.0 -0.7477551 1.0 -0.95762753
1.0 0.8493913 1.0 0.6928961
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1.0 -1.0 1.0 0.9368346
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1.0 -0.16162877 -1.0 -0.88680923
-0.4261324 1.0 -1.0 0.95578337
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0.9454517 0.26766038 1.0 -0.7693687
1.0 -1.0 -1.0 -0.9820487
1.0 -0.16850078 1.0 0.7808398
-0.0987789 -0.43427727 1.0 -0.69806564
-1.0 -1.0 1.0 -0.98492146
rewards 1.7132440914375242
turbulence 37.130001068115234
trade: 1532
cost: 2846.0781639690445
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-1.0 -0.18356341 -1.0 0.60638344
-1.0 -1.0 1.0 0.08138454
-1.0 1.0 -1.0 0.98728156
0.3814965 -0.34476846 1.0 0.9061396
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1.0 1.0 1.0 -0.09914571
0.40622848 -0.93199736 1.0 -0.8503105
-1.0 0.6707988 -1.0 0.56747115
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-1.0 1.0 -1.0 -0.93776256
1.0 -1.0 1.0 -0.4485811
```

```
1.0 -0.32205254 1.0 -0.91401166
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1.0 1.0 1.0 0.99260044
1.0 1.0 1.0 0.93211126
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0.19721198 -1.0 -1.0 0.971045
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-1.0 -1.0 -1.0 -0.70967126
1.0 0.7041142 -1.0 0.9747534
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1.0 -1.0 1.0 0.6793425
1.0 0.6990932 1.0 -0.98026305
-1.0 -0.60927105 1.0 -0.9323073
rewards 2.2207852455520536
turbulence 35.54999923706055
trade: 1550
cost: 2850.5685810680434
-1.0 -0.12584008 -1.0 0.9452946
-0.7828814 -1.0 -1.0 0.52461886
-1.0 -0.11083391 1.0 -0.3453554
-1.0 -0.3541761 -1.0 0.9765911
1.0 -0.8978068 1.0 0.9600978
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1.0 1.0 1.0 0.9390415
1.0 -1.0 1.0 -0.40426064
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1.0 1.0 1.0 -0.9205526
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1.0 1.0 1.0 -0.107457936
-1.0 1.0 1.0 -0.9525193
```

```
-1.0 -0.6000593 1.0 -0.9725027
rewards -0.02892764881362673
turbulence 29.56999969482422
trade: 1566
cost: 2872.0702088222542
-0.93189293 -0.5472176 -1.0 0.97645795
-1.0 -1.0 -1.0 0.77812123
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-1.0 -0.35744786 -1.0 0.9347143
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-1.0 0.59552824 -1.0 0.93227243
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-1.0 0.2703833 -1.0 -0.9226847
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1.0 -1.0 1.0 -0.99130404
1.0 -0.45978197 1.0 -0.86180794
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1.0 0.08913024 1.0 0.9305656
1.0 0.31227985 -1.0 -0.96647716
1.0 -0.59795123 -1.0 -0.9702272
-1.0 1.0 -1.0 0.9908149
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-1.0 -0.6329479 -1.0 -0.99709547
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1.0 1.0 -1.0 -0.9460815
1.0 1.0 1.0 0.387738
-1.0 0.7942516 1.0 -0.85565567
-1.0 0.80322134 1.0 -0.9250989
rewards 3.4065594839988744
turbulence 27.57999992370605
trade: 1584
cost: 2894.106937742237
-0.835389 0.6886313 -1.0 0.98541546
-1.0 -0.51275885 -1.0 0.85611105
-1.0 1.0 1.0 -0.74498
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0.44265112 1.0 1.0 0.8106966
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1.0 -0.5818249 1.0 0.9870112
1.0 -1.0 1.0 0.26766562
-1.0 -1.0 1.0 -0.9489105
-1.0 -0.07899411 -1.0 -0.70024204
```

```
1.0 1.0 1.0 0.5256078
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0.6103666 1.0 1.0 0.7152064
0.9282102 0.40033132 1.0 -0.7880011
-1.0 -0.35979652 1.0 -0.9752621
rewards -0.3483119928417262
turbulence 24.86000061035156
trade: 1602
cost: 2902.4415725803415
-0.41149962 -1.0 -1.0 0.869683
-1.0 -0.27180436 -1.0 0.9531734
-1.0 -0.96140146 1.0 0.0568527
-1.0 0.1148248 -1.0 0.99701047
1.0 1.0 1.0 0.87810755
0.13883936 0.16618271 -1.0 0.8251109
1.0 1.0 1.0 0.92253184
-0.28986335 0.3899103 1.0 0.46168637
0.2850117 0.043761656 1.0 -0.9628347
-1.0 -1.0 -1.0 0.73224306
1.0 1.0 1.0 0.72046745
-1.0 -1.0 -1.0 -0.9411857
1.0 1.0 1.0 0.004374504
1.0 -0.17374083 1.0 -0.9804902
1.0 -1.0 1.0 -0.93677413
1.0 0.5159614 1.0 0.9597541
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1.0 1.0 1.0 0.9191344
0.66066474 0.84135985 -1.0 -0.9933902
1.0 0.30593923 -1.0 -0.91327965
1.0 -0.8497077 -1.0 0.9671209
-0.9510952 0.18142168 -1.0 0.967963
-1.0 0.113874316 -1.0 -0.6544287
1.0 0.5328708 -1.0 0.9867252
-1.0 -0.33724034 1.0 -0.6786251
```

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1.0 0.88886744 -1.0 -0.92346686
1.0 -0.41243744 1.0 -0.2708794
-0.8045295 -0.6709832 1.0 -0.8603033
-1.0 -0.4296484 1.0 -0.9861653
rewards 3.0215096077606316
turbulence 25.75
trade: 1620
cost: 2911.7605531101267
-0.6772238 -1.0 -1.0 0.848302
-1.0 -1.0 -1.0 0.38070607
-1.0 -0.7735734 1.0 -0.9137772
-1.0 0.22342557 -1.0 0.9668889
0.56924146 -0.71976435 1.0 0.43743896
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1.0 0.21730733 1.0 0.9896507
1.0 -1.0 1.0 0.7131046
-0.31666675 1.0 1.0 -0.60959625
-1.0 0.49627805 -1.0 -0.87326837
1.0 -1.0 1.0 -0.25677586
-1.0 -0.47462863 -1.0 -0.754859
0.94665337 0.008672655 1.0 0.7286904
1.0 -1.0 1.0 -0.9670321
1.0 -0.23113689 1.0 -0.98539454
1.0 0.6071998 1.0 0.7867191
1.0 -0.37529325 1.0 0.9950583
0.7410206 1.0 1.0 0.46867824
1.0 0.7647644 -1.0 -0.96334326
1.0 -0.8175024 -1.0 -0.98281085
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-0.9486338 1.0 -1.0 0.97257996
-1.0 -0.16386873 -1.0 -0.9454534
1.0 -1.0 -1.0 0.9844315
-0.49865443 1.0 1.0 -0.9642315
1.0 0.6386896 -1.0 -0.84493923
1.0 1.0 1.0 0.28749108
-0.52641577 0.92285013 1.0 -0.97608894
-1.0 0.2734181 1.0 -0.96905416
rewards -0.05673513498955872
turbulence 24.799999237060547
trade: 1634
cost: 2918.1757877407117
0.32129937 0.17210755 -1.0 0.88630915
0.24698448 -0.9982311 -1.0 0.116000414
-0.93464434 1.0 1.0 -0.96611065
-1.0 0.21988505 -1.0 0.99421835
1.0 1.0 1.0 0.5345843
-1.0 1.0 -1.0 0.48443627
0.42311066 0.2008906 1.0 0.9840915
```

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1.0 -0.40649462 1.0 0.76149905
-0.80922055 -0.7913959 1.0 -0.93807274
-1.0 1.0 -1.0 -0.8682353
1.0 -0.2330814 1.0 -0.16432315
-1.0 1.0 -1.0 -0.81573385
0.065641165 1.0 1.0 0.03745985
1.0 0.64895487 1.0 -0.8602916
1.0 0.061078057 1.0 -0.9848331
1.0 0.5584508 1.0 0.9833039
1.0 -1.0 1.0 0.98517394
1.0 -1.0 1.0 0.9569483
0.6107129 -0.881871 -1.0 -0.94256014
1.0 0.77747107 -1.0 -0.94726586
0.13525742 -0.9568223 -1.0 0.99194026
-0.14973234 0.61603945 -1.0 0.9776646
-1.0 -1.0 -1.0 -0.982576
1.0 0.06749603 -1.0 0.9907234
-0.13435239 1.0 1.0 -0.9304624
1.0 -1.0 -1.0 -0.8923203
1.0 -0.1089901 1.0 0.5278897
0.3792383 0.7484532 1.0 -0.9612383
-0.95061696 1.0 1.0 -0.89906174
rewards 0.29724039039611816
turbulence 23.450000762939453
trade: 1652
cost: 2918.1757877407117
-1.0 -1.0 -1.0 0.9577924
-0.70774686 -1.0 -1.0 0.8783419
-1.0 -0.012183204 1.0 -0.86513144
-1.0 -0.67902833 -1.0 0.99752736
-0.9630762 0.9216002 1.0 0.64691544
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0.6464896 -1.0 1.0 -0.08356112
1.0 -0.74224436 1.0 0.95868444
0.35662448 1.0 1.0 0.8754246
1.0 -0.01828025 -1.0 -0.9867187
1.0 1.0 -1.0 -0.68689823
1.0 0.25030074 -1.0 0.98949766
-0.86519563 -0.107792005 -1.0 0.9864751
```

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-1.0 -0.2202828 -1.0 -0.9757946
1.0 -0.3574 -1.0 0.97332716
1.0 0.9257967 1.0 -0.8536229
1.0 1.0 -1.0 -0.6977471
1.0 1.0 1.0 0.7470846
0.9720489 -0.84776765 1.0 -0.9166063
-0.9894755 0.40923974 1.0 -0.99077356
rewards -1.2893436416782207
turbulence 25.350000381469727
trade: 1667
cost: 2952.1701993656206
-1.0 -0.4038689 -1.0 0.40583587
-1.0 0.8881297 -1.0 0.39095318
-1.0 1.0 1.0 -0.5334177
-0.7605864 0.17230737 -1.0 0.9147626
1.0 -1.0 1.0 0.8686522
-1.0 0.5948308 -1.0 0.91048765
0.84317 0.12329239 1.0 0.9541708
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1.0 -0.710225 1.0 -0.5960174
-0.679657 -1.0 -1.0 -0.059781373
1.0 0.44008505 1.0 0.25207174
-1.0 1.0 -1.0 -0.7992592
1.0 0.15674871 1.0 -0.37943363
1.0 0.57535183 1.0 -0.94972265
1.0 -1.0 1.0 -0.5789744
1.0 -0.2935931 1.0 0.4338287
0.76912934 -0.43998164 1.0 0.9775095
1.0 0.91613555 1.0 0.95967746
1.0 -1.0 -1.0 -0.989206
1.0 0.4290576 -1.0 -0.9726409
0.7912961 -1.0 -1.0 0.9939995
-0.48877358 0.97469056 -1.0 0.98611283
-1.0 -1.0 -1.0 -0.85751075
1.0 -0.54747796 -1.0 0.9950216
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1.0 -0.7783508 1.0 0.32425308
-0.021551162 0.5233537 1.0 -0.83243906
-1.0 -0.95769435 1.0 -0.8508084
rewards 1.5636046235877787
turbulence 23.100000381469727
trade: 1683
cost: 2955.890290391927
-1.0 0.31923467 -1.0 0.8526226
-1.0 -1.0 -1.0 0.8951794
-1.0 0.9153592 1.0 -0.23838264
-0.84562325 0.26723552 -1.0 0.9690516
```

```
-1.0 1.0 1.0 0.96806145
-1.0 -1.0 -1.0 0.9112402
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1.0 0.65201193 1.0 0.20775676
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-1.0 -1.0 -1.0 -0.8730449
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1.0 -0.76614785 1.0 -0.887009
0.67290175 -1.0 1.0 0.88603985
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1.0 -1.0 -1.0 -0.42452025
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0.86925167 0.9312602 1.0 -0.98329794
-1.0 0.29322568 1.0 -0.96807647
rewards 1.62031003215448
turbulence 22.450000762939453
trade: 1700
cost: 2970.930017827993
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-0.28282666 -0.015442483 -1.0 0.38789308
-1.0 1.0 1.0 -0.983511
-1.0 -0.12873018 -1.0 0.97610223
0.8953528 -1.0 1.0 0.98723924
-1.0 1.0 -1.0 0.6837969
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0.6598225 -0.5649534 1.0 -0.6353861
-1.0 -1.0 -1.0 -0.5561813
1.0 -0.19447632 1.0 0.78084135
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1.0 -0.35077727 1.0 -0.7806835
1.0 -0.5935815 1.0 0.6180413
1.0 -0.21032959 1.0 0.9960872
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1.0 -1.0 -1.0 -0.9060922
```

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1.0 -1.0 1.0 0.24850762
0.47826833 -0.110337704 1.0 -0.96268535
-1.0 1.0 1.0 -0.91758037
rewards -0.463706297991937
turbulence 22.709999084472656
trade: 1715
cost: 2981.6731811580717
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-1.0 -0.2229691 -1.0 0.77668333
-1.0 0.37482613 1.0 -0.8541359
-1.0 -1.0 -1.0 0.96229935
1.0 1.0 1.0 0.84173846
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1.0 -0.9031551 1.0 0.8438915
-1.0 1.0 -1.0 -0.5128209
1.0 -1.0 1.0 -0.39463425
1.0 1.0 1.0 -0.87684816
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1.0 -0.3846525 1.0 0.66769576
1.0 1.0 1.0 0.9832423
1.0 -0.82972026 1.0 0.9492016
1.0 -1.0 -1.0 -0.95032835
1.0 -1.0 -1.0 0.2745731
1.0 -0.06591219 -1.0 0.9685273
-0.6837854 0.40442252 -1.0 0.95941615
-1.0 -1.0 -1.0 -0.9368024
1.0 1.0 -1.0 0.9766116
-0.36905247 1.0 1.0 -0.89259493
1.0 0.75511163 -1.0 -0.83725464
1.0 -1.0 1.0 0.9847357
1.0 -0.34471458 1.0 -0.8532444
-1.0 -1.0 1.0 -0.9631494
rewards -0.8845496881500352
turbulence 23.84000015258789
trade: 1731
cost: 3001.3091007442536
-1.0 -1.0 -1.0 0.9473784
```

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-1.0 1.0 -1.0 0.8603537
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1.0 1.0 1.0 0.4076165
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1.0 1.0 1.0 -0.957077
1.0 0.050994232 1.0 0.6574459
1.0 1.0 1.0 0.98953366
1.0 0.42372748 1.0 0.9254947
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1.0 -1.0 -1.0 0.84554243
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1.0 -0.8200917 1.0 0.75918865
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-1.0 -1.0 1.0 -0.9896917
rewards 0.21802603437346407
turbulence 23.11000061035156
trade: 1748
cost: 3008.2492346096096
0.45612192 -1.0 -1.0 0.9644377
-1.0 -0.17449513 -1.0 0.9065304
-0.4823612 1.0 1.0 -0.8259233
-0.8970072 -0.47515872 -1.0 0.95190775
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1.0 -1.0 1.0 0.94392467
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-1.0 -1.0 -1.0 -0.92626286
1.0 0.020659655 1.0 0.7567421
-1.0 0.8920355 -1.0 -0.8892008
1.0 0.7312082 1.0 0.76405823
1.0 0.64924234 1.0 -0.86984664
1.0 -0.8521345 1.0 -0.7973398
1.0 -0.04745859 1.0 0.3657186
```

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0.4309855 0.042682678 1.0 0.9856992
0.1963191 -0.7408234 1.0 0.9415326
0.7215615 -0.8265717 -1.0 -0.93244624
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1.0 1.0 -1.0 0.9754344
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-1.0 -1.0 -1.0 -0.9534433
1.0 1.0 -1.0 0.98957396
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1.0 1.0 -1.0 -0.9872227
1.0 1.0 1.0 0.73575747
1.0 1.0 1.0 -0.93435264
-1.0 -1.0 1.0 -0.9746412
rewards -0.35099985517577736
turbulence 23.700000762939453
trade: 1764
cost: 3015.2476642971096
-0.2934397 -0.3600001 -1.0 0.97605395
-1.0 -0.6778897 -1.0 0.9267688
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-1.0 -1.0 -1.0 0.9804361
-0.33702597 0.7451926 1.0 0.90513825
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-1.0 -1.0 -1.0 -0.14626527
1.0 0.08642964 1.0 0.432181
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1.0 -0.19167528 1.0 -0.90457904
1.0 0.738356 1.0 -0.950984
0.9188218 -0.842358 1.0 -0.9692197
1.0 1.0 1.0 0.94209576
0.4408623 -0.71836674 1.0 0.9837389
-1.0 -0.71487355 1.0 0.95679545
0.98363495 -0.37560573 -1.0 -0.90436137
1.0 0.4533531 -1.0 -0.55017924
-1.0 1.0 -1.0 0.92045605
0.6411589 0.31630325 -1.0 0.90151954
-1.0 -0.0107188225 -1.0 -0.9798977
1.0 -1.0 -1.0 0.982414
-1.0 -1.0 1.0 -0.9757183
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1.0 1.0 1.0 0.7582848
0.14908937 1.0 1.0 -0.95924777
-0.78363776 -0.44560358 1.0 -0.9881689
rewards 0.5144867263408843
turbulence 22.65999984741211
```

```
trade: 1780
cost: 3041.3433563633025
0.8592886 -0.9327672 -1.0 0.9377167
-1.0 -1.0 -1.0 0.7863114
-1.0 -0.4550197 1.0 0.086054206
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-0.36864766 -1.0 1.0 0.79887915
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1.0 1.0 1.0 0.9907701
1.0 1.0 1.0 -0.8432138
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1.0 -0.83028686 1.0 -0.2429291
-1.0 -0.82098776 -1.0 -0.94796175
0.99929917 -0.5395284 1.0 0.7177421
1.0 -1.0 1.0 -0.9696378
1.0 -0.41661447 1.0 -0.9889318
1.0 0.01565966 1.0 0.93897474
0.75937533 -0.72817606 1.0 0.93782985
1.0 0.5685881 1.0 0.87613523
1.0 -0.6947915 -1.0 -0.9889674
1.0 -0.6703688 -1.0 -0.8511368
-0.0022218525 -1.0 -1.0 0.97941554
-0.58768594 -0.59829617 -1.0 0.9482727
-1.0 -0.87500507 -1.0 -0.9357255
1.0 1.0 -1.0 0.95928144
-1.0 0.09714866 1.0 -0.95458394
1.0 -1.0 -1.0 -0.39951146
1.0 0.10159467 1.0 0.9745686
0.40412724 1.0 1.0 -0.9540287
-1.0 -0.9529642 1.0 -0.8415136
rewards 1.7476508281337564
turbulence 21.63999938964844
trade: 1798
cost: 3074.633937482841
-0.31241208 0.6423028 -1.0 0.98791385
-1.0 -1.0 -1.0 0.90915847
-1.0 -0.26930952 1.0 -0.7737314
-1.0 0.23155184 -1.0 0.9813025
1.0 -0.43363196 1.0 0.866048
-1.0 0.16219239 -1.0 0.86747754
1.0 -0.5241907 1.0 0.9299886
1.0 -0.6027002 1.0 -0.5587853
-0.14526522 1.0 1.0 -0.8237255
-1.0 -0.015499204 -1.0 -0.9825578
1.0 0.4618129 1.0 0.07174599
-1.0 -1.0 -1.0 -0.9648833
1.0 0.5416214 1.0 0.70972586
```

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1.0 -0.16542226 1.0 -0.8610114
1.0 1.0 1.0 -0.9478179
1.0 1.0 1.0 0.31339312
0.6407918 -1.0 1.0 0.9782908
0.036635876 -0.4127052 1.0 0.95134664
1.0 -1.0 -1.0 -0.9765869
1.0 -0.26822284 -1.0 -0.9298175
0.22293259 -1.0 -1.0 0.9217944
-1.0 1.0 -1.0 0.88357246
-1.0 -1.0 -1.0 -0.9694176
1.0 0.6884955 -1.0 0.9683615
-1.0 0.78548044 1.0 0.06893015
1.0 -1.0 -1.0 0.23520768
1.0 1.0 1.0 0.8349143
-0.6633326 1.0 1.0 -0.9801116
-1.0 -1.0 1.0 -0.6984379
rewards -0.20525665370025672
turbulence 21.25
trade: 1817
cost: 3074.939480527885
-1.0 0.94666195 -1.0 0.9530778
-1.0 -0.7698026 -1.0 -0.3618552
-1.0 -0.58727926 1.0 -0.5511246
-1.0 -1.0 -1.0 0.99414253
0.89973646 -1.0 1.0 0.60553026
-1.0 1.0 -1.0 0.93756795
1.0 -0.15138364 1.0 0.9377897
1.0 0.24282168 1.0 0.5296507
-1.0 -0.43182677 1.0 -0.8933831
-1.0 -1.0 -1.0 0.69631696
1.0 1.0 1.0 -0.43229902
-1.0 0.80147713 -1.0 -0.9799984
0.95000666 0.19909881 1.0 0.22938657
1.0 -0.2082462 1.0 -0.995986
1.0 0.52777463 1.0 -0.73376787
1.0 -0.25444126 1.0 0.8281548
1.0 -0.96051586 1.0 0.9880842
1.0 -0.24356821 1.0 0.92962193
1.0 -0.93940085 -1.0 -0.8295756
1.0 -0.44889536 -1.0 -0.7671397
0.9651369 1.0 -1.0 0.97871256
-1.0 1.0 -1.0 0.9374778
-1.0 -0.7022987 -1.0 -0.7317493
1.0 -0.97290945 -1.0 0.98255956
-0.3406672 1.0 1.0 -0.03838545
1.0 -0.67015773 -1.0 -0.97421455
1.0 1.0 1.0 0.47133827
-0.3251539 -1.0 1.0 -0.98268086
```

```
-1.0 -1.0 1.0 -0.9448917
rewards -0.3814968425987056
turbulence 20.84000015258789
trade: 1833
cost: 3087.9816980190344
-0.26355898 -1.0 -1.0 0.9815515
-1.0 -0.12249902 -1.0 -0.2757786
-1.0 -0.7076498 1.0 -0.8347011
-1.0 0.04593663 -1.0 0.980963
-0.016699154 -0.9034312 1.0 0.9227989
-0.8972081 1.0 -1.0 0.9737222
-0.28647125 -0.86123174 1.0 0.96492004
1.0 -0.73563296 1.0 0.08694923
-0.66020393 -0.60451674 1.0 -0.9313953
-1.0 -1.0 -1.0 -0.50844646
1.0 0.94091046 1.0 -0.2696175
-1.0 -1.0 -1.0 -0.9383544
1.0 1.0 1.0 0.70560896
1.0 0.28231192 1.0 -0.96291167
1.0 -1.0 1.0 -0.93772775
1.0 1.0 1.0 0.6224898
1.0 -0.06455903 1.0 0.9773985
1.0 -0.15260771 1.0 0.69307995
0.92861295 -0.35490206 -1.0 -0.99504673
1.0 0.5480099 -1.0 -0.18524814
1.0 1.0 -1.0 0.953249
-0.5467675 -0.5300669 -1.0 0.99383533
-1.0 1.0 -1.0 -0.92139524
1.0 1.0 -1.0 0.942374
-0.15896422 0.9271522 1.0 -0.8794739
1.0 1.0 -1.0 -0.90317094
1.0 -1.0 1.0 0.45794427
-1.0 0.55578893 1.0 -0.9289241
-1.0 -0.38787833 1.0 -0.91374296
rewards -1.3345671003002209
turbulence 20.56999969482422
trade: 1849
cost: 3098.6159540424414
-0.3001178 1.0 -1.0 0.93690336
-1.0 -1.0 -1.0 0.87234974
-1.0 0.7850607 1.0 -0.730301
-1.0 -0.1422992 -1.0 0.97702074
0.80477065 1.0 1.0 0.7524748
0.16940975 -0.6374459 -1.0 0.9755182
1.0 -1.0 1.0 0.9734485
0.64580464 -0.029115573 1.0 -0.6310852
-1.0 -1.0 1.0 -0.71065295
-1.0 -0.08213008 -1.0 -0.9037309
```

```
1.0 0.32990527 1.0 -0.8947042
-1.0 1.0 -1.0 -0.95798665
1.0 1.0 1.0 0.9272548
1.0 0.6254257 1.0 -0.91675085
1.0 -1.0 1.0 -0.9689174
1.0 -0.023522288 1.0 0.9105706
1.0 -1.0 1.0 0.9693749
0.50704384 1.0 1.0 0.9251102
0.01701808 -0.8293801 -1.0 -0.98740077
1.0 -1.0 -1.0 -0.6214869
1.0 0.8516501 -1.0 0.98172104
-0.4605754 -0.24087624 -1.0 0.9153986
-1.0 -0.82669365 -1.0 -0.63735354
1.0 1.0 -1.0 0.9933245
-0.33851385 -1.0 1.0 -0.9365677
1.0 0.5448528 -1.0 -0.5132123
1.0 1.0 1.0 0.7887502
1.0 -0.63073814 1.0 -0.7690567
-1.0 -0.90350854 1.0 -0.94247544
rewards 1.6993675910705468
turbulence 20.770000457763672
trade: 1864
cost: 3105.0197514362403
-1.0 -1.0 -1.0 0.994719
-1.0 -0.5683432 -1.0 0.9513217
-1.0 -0.86151844 1.0 -0.74396396
-1.0 -1.0 -1.0 0.98428166
0.5098535 -0.059834566 1.0 0.96161056
-1.0 -0.8835252 -1.0 0.7524097
1.0 0.4911835 1.0 0.801445
1.0 -1.0 1.0 0.20798707
1.0 -0.95646864 1.0 -0.9514562
-1.0 -0.27416426 -1.0 -0.69882035
1.0 -0.92408293 1.0 0.41476476
-1.0 1.0 -1.0 -0.9792819
1.0 -1.0 1.0 0.117433906
1.0 1.0 1.0 -0.9025898
1.0 -0.9869278 1.0 -0.9710831
1.0 0.9245481 1.0 0.96292424
1.0 -1.0 1.0 0.93010163
1.0 -0.68128276 1.0 0.92158675
1.0 -1.0 -1.0 -0.9799065
1.0 -0.1707035 -1.0 -0.97793114
-1.0 -1.0 -1.0 0.97451687
1.0 -0.23747899 -1.0 0.9722407
-0.85939133 -0.015701383 -1.0 -0.9241982
1.0 0.64466816 -1.0 0.9677944
-0.43602386 0.73747635 1.0 -0.8298254
```

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1.0 1.0 -1.0 -0.9904993
1.0 0.21544157 1.0 0.73295367
0.22870567 0.6289644 1.0 -0.8924298
-1.0 1.0 1.0 -0.8716523
rewards 0.31977847785416524
turbulence 21.170000076293945
trade: 1881
cost: 3143.9479131107405
-1.0 -0.3925106 -1.0 0.9803306
-0.4218074 -1.0 -1.0 0.9565737
-1.0 0.7141689 1.0 -0.80308944
-1.0 -1.0 -1.0 0.9830563
-0.63610685 0.49721122 1.0 0.8506838
-0.9872746 -0.30822897 -1.0 0.93330693
0.8926804 0.8745625 1.0 0.9891372
-0.029021263 -1.0 1.0 -0.1204679
1.0 0.92384106 1.0 -0.907233
-1.0 1.0 -1.0 -0.7345697
1.0 1.0 1.0 0.91441846
-1.0 0.50723827 -1.0 -0.9286183
0.95313936 -0.71810687 1.0 0.8184161
1.0 1.0 1.0 -0.8888688
1.0 -1.0 1.0 -0.9859743
1.0 -0.28966582 1.0 0.97007346
0.11795384 1.0 1.0 0.7510915
-1.0 -0.58934677 1.0 0.86662257
0.9731472 -1.0 -1.0 -0.99051595
1.0 -0.9115506 -1.0 -0.9283778
0.15817472 -0.5021711 -1.0 0.98795676
1.0 0.57758254 -1.0 0.9857086
-1.0 -0.75346917 -1.0 -0.8788584
1.0 0.76485574 -1.0 0.9957757
-1.0 0.8158308 1.0 -0.9755604
1.0 -1.0 -1.0 -0.4663372
-0.026940823 -1.0 1.0 0.9252069
0.011349149 -0.8880523 1.0 -0.9897598
-0.06865668 -1.0 1.0 -0.975603
rewards 0.4827693133857567
turbulence 21.280000686645508
trade: 1897
cost: 3161.2017244434433
-1.0 0.7338451 -1.0 0.95490646
-1.0 -0.8355437 -1.0 0.76501775
-1.0 0.5194755 1.0 -0.70733666
-1.0 1.0 -1.0 0.951267
-0.11076185 0.106544435 1.0 0.58349776
-1.0 1.0 -1.0 0.9330872
0.17402011 0.47431323 1.0 0.9852928
```

```
1.0 0.97300124 1.0 -0.5043049
-0.17005688 -0.3443616 1.0 -0.75283146
-1.0 -0.84568214 -1.0 -0.23141849
1.0 -1.0 1.0 -0.87031984
-1.0 1.0 -1.0 -0.82899356
0.1692344 1.0 1.0 0.48642457
1.0 0.019612566 1.0 -0.9514064
1.0 -1.0 1.0 -0.9720766
1.0 1.0 1.0 0.92101455
0.27517617 -1.0 1.0 0.9902308
1.0 1.0 1.0 0.99523187
1.0 0.37285125 -1.0 -0.9245448
1.0 0.21662733 -1.0 -0.87760013
-0.5648614 -0.5746379 -1.0 0.9949976
-1.0 0.12091334 -1.0 0.9767208
-1.0 -0.7191256 -1.0 -0.9227159
1.0 0.96678406 -1.0 0.9402846
-1.0 1.0 1.0 -0.84592474
1.0 -0.5369962 -1.0 -0.5441665
1.0 1.0 1.0 0.8121884
-1.0 -0.2790614 1.0 -0.95769644
-1.0 -1.0 1.0 -0.9493539
rewards 1.0103553662811406
turbulence 20.790000915527344
trade: 1912
cost: 3168.700067399986
-1.0 1.0 -1.0 0.9208529
-0.53585076 -0.7121807 -1.0 0.9144652
-1.0 -1.0 1.0 0.2434479
-1.0 0.0933826 -1.0 0.9793892
1.0 -1.0 1.0 0.9616728
-0.5062302 0.8439108 -1.0 -0.5419594
1.0 -1.0 1.0 0.9286591
1.0 -0.119668804 1.0 0.28001785
0.46873003 -1.0 1.0 -0.9459094
-1.0 -0.92983097 -1.0 0.18411672
1.0 0.35096902 1.0 0.91503537
-1.0 1.0 -1.0 -0.959348
1.0 0.31936947 1.0 -0.8851742
1.0 -0.29987448 1.0 -0.990467
1.0 1.0 1.0 -0.9717248
1.0 0.7101587 1.0 0.8420255
-0.23900616 0.7687149 1.0 0.9881253
1.0 1.0 1.0 0.9519032
1.0 1.0 -1.0 -0.96383536
1.0 -1.0 -1.0 -0.9718225
1.0 1.0 -1.0 0.8233533
-1.0 0.42721492 -1.0 0.9808494
```

```
-1.0 -0.88561654 -1.0 -0.97645175
1.0 0.89034474 -1.0 0.89565396
1.0 1.0 1.0 -0.89807576
1.0 1.0 -1.0 -0.8014523
1.0 -1.0 1.0 0.76785743
-1.0 -1.0 1.0 -0.9478484
0.24253058 -0.2686172 1.0 -0.98137087
rewards -0.584309259600076
turbulence 21.299999237060547
trade: 1930
cost: 3171.572482889183
-1.0 -0.2595763 -1.0 0.89422536
-1.0 1.0 -1.0 0.90295696
-1.0 1.0 1.0 -0.92238724
-1.0 -0.5293101 -1.0 0.96706796
1.0 -0.39405566 1.0 0.9840342
-1.0 0.71623003 -1.0 0.9058448
0.8577277 -0.08219847 1.0 0.99151945
1.0 1.0 1.0 -0.7578235
1.0 0.89198667 1.0 -0.92141986
-1.0 0.5888846 -1.0 -0.80010796
1.0 0.12663904 1.0 0.58179784
-1.0 -0.9477696 -1.0 -0.96658844
1.0 -0.09072934 1.0 0.74438167
1.0 0.069127426 1.0 -0.9734273
1.0 -1.0 1.0 -0.87045664
1.0 0.79016036 1.0 0.9920292
0.59944534 -1.0 1.0 0.9980655
1.0 0.1846413 1.0 0.9396769
1.0 0.32412654 -1.0 -0.85537344
1.0 1.0 -1.0 -0.9934134
1.0 1.0 -1.0 0.9874599
1.0 -0.68069226 -1.0 0.95158386
-1.0 0.5159412 -1.0 -0.91024446
1.0 -0.5306483 -1.0 0.9769751
-1.0 0.5802077 1.0 -0.38573617
1.0 1.0 -1.0 -0.9891776
0.5648627 -1.0 1.0 0.9566511
0.32181406 -0.11250803 1.0 -0.8956289
-1.0 -1.0 1.0 -0.9880398
rewards 0.6211494089569198
turbulence 20.68000030517578
trade: 1948
cost: 3183.5216916599347
-1.0 0.16886365 -1.0 0.9658389
-1.0 -1.0 -1.0 0.927794
-1.0 0.84343636 1.0 -0.86795545
-0.06839776 0.078400016 -1.0 0.9379263
```

```
0.44721127 -1.0 1.0 0.56206393
-0.95053804 -0.18338639 -1.0 0.78907037
-0.56513095 0.570071 1.0 0.98514235
1.0 1.0 1.0 -0.8855313
-1.0 1.0 1.0 -0.90340185
-1.0 1.0 -1.0 0.22631371
1.0 1.0 1.0 -0.90184784
-1.0 0.19611254 -1.0 -0.9382305
1.0 0.7987015 1.0 0.6173755
1.0 -0.33698887 1.0 -0.9661107
1.0 1.0 1.0 -0.9959581
1.0 0.9307486 1.0 0.8898885
0.038824916 -0.7762565 1.0 0.9823264
0.953848 1.0 1.0 0.967345
1.0 -0.7504273 -1.0 -0.9869006
1.0 1.0 -1.0 -0.92546856
0.8259133 0.56508636 -1.0 0.982975
-1.0 0.8916552 -1.0 0.8832263
-1.0 -0.2331679 -1.0 -0.98985755
1.0 -0.98463655 -1.0 0.7490175
-1.0 1.0 1.0 -0.7366493
1.0 0.7077824 -1.0 -0.71959543
1.0 -0.16247992 1.0 0.0911746
0.23736241 1.0 1.0 -0.91837496
-1.0 -0.53797305 1.0 -0.7983387
rewards -0.49896540222167973
turbulence 22.270000457763672
trade: 1965
cost: 3183.5216916599347
-0.24023157 0.90567076 -1.0 0.84571123
-1.0 -1.0 -1.0 0.8844837
-1.0 -0.3044735 1.0 -0.88383555
-0.47676158 0.37603515 -1.0 0.98802614
-0.19599782 1.0 1.0 0.92473817
-0.30876207 -1.0 -1.0 0.44233727
0.9220912 1.0 1.0 0.9157419
1.0 -0.35544962 1.0 -0.75144607
-0.43509707 -0.09478927 1.0 -0.94890857
-1.0 -1.0 -1.0 0.12714541
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-1.0 1.0 -1.0 -0.88875294
1.0 0.9245888 1.0 -0.017371416
1.0 -1.0 1.0 -0.9151053
1.0 -0.11410953 1.0 -0.9639281
0.98641646 -0.28726515 1.0 0.97035265
-0.082497716 -1.0 1.0 0.96522
1.0 -0.27825934 1.0 0.7089865
1.0 -1.0 -1.0 -0.9502869
```

```
1.0 1.0 -1.0 -0.98193145
0.5003098 1.0 -1.0 0.9623132
0.34999818 1.0 -1.0 0.81154
-1.0 0.2431046 -1.0 -0.9179926
1.0 0.72096217 -1.0 0.9611231
1.0 -0.704669 1.0 -0.004456997
1.0 0.7116579 -1.0 -0.7869249
1.0 -0.7139387 1.0 0.69567823
-0.66496843 1.0 1.0 -0.9871025
-1.0 -1.0 1.0 -0.98101413
rewards 0.06407572631835938
turbulence 22.520000457763672
trade: 1978
cost: 3183.5216916599347
-1.0 1.0 -1.0 0.950235
-1.0 -1.0 -1.0 0.8830557
-0.2666099 -0.65349495 1.0 -0.43748945
-1.0 0.73779535 -1.0 0.94455314
-0.08152238 -1.0 1.0 0.8911185
-1.0 0.30625135 -1.0 0.33806407
1.0 0.9477822 1.0 0.98703647
0.7465022 0.66617614 1.0 -0.4225905
0.49158806 1.0 1.0 -0.7076006
-1.0 -0.7203909 -1.0 0.29933798
1.0 1.0 1.0 -0.9271358
-1.0 0.12121615 -1.0 -0.9483279
1.0 1.0 1.0 0.32547545
1.0 -1.0 1.0 -0.9671141
1.0 -1.0 1.0 -0.8209668
1.0 -0.27563938 1.0 0.8572072
0.257872 1.0 1.0 0.84702134
1.0 1.0 1.0 0.85883904
0.60458887 0.17098007 -1.0 -0.94521475
1.0 -1.0 -1.0 -0.9384616
-0.24967605 -0.620723 -1.0 0.98283195
-1.0 -0.17049709 -1.0 0.9881376
-1.0 0.19098839 -1.0 -0.89333165
1.0 1.0 -1.0 0.99591863
-1.0 1.0 1.0 -0.55241996
1.0 -0.4268566 -1.0 -0.8843056
1.0 -1.0 1.0 -0.11071479
-0.31436655 1.0 1.0 -0.93926126
-1.0 -1.0 1.0 -0.9354399
rewards -0.28157028213043234
turbulence 23.309999465942383
trade: 1994
cost: 3194.7553853092268
0.7450546 -0.6825844 -1.0 0.93483794
```

```
-1.0 0.006181523 -1.0 0.94168043
-1.0 -0.9757311 1.0 -0.97356147
-1.0 0.1028032 -1.0 0.9531958
-1.0 0.57846487 1.0 0.6804942
-0.0408417 0.34890914 -1.0 0.8183377
1.0 1.0 1.0 0.8883859
0.6188283 1.0 1.0 -0.8495029
-0.6915777 -0.44666392 1.0 -0.90479213
-1.0 0.37101614 -1.0 -0.6549816
1.0 1.0 1.0 0.76102865
-1.0 -1.0 -1.0 -0.98309314
1.0 1.0 1.0 0.16619527
1.0 -1.0 1.0 -0.92124367
1.0 -0.01523754 1.0 -0.9748801
1.0 0.38566637 1.0 0.5150057
1.0 0.7658588 1.0 0.9696801
1.0 -0.46124795 1.0 0.98100245
1.0 -1.0 -1.0 -0.9433177
1.0 -0.13095994 -1.0 -0.9560132
0.9011301 1.0 -1.0 0.9282527
-0.48084298 -0.19232565 -1.0 0.9845159
-1.0 -0.63277805 -1.0 -0.80608976
1.0 1.0 -1.0 0.9593513
-1.0 1.0 1.0 -0.9161504
1.0 -0.14930174 -1.0 -0.78084946
1.0 1.0 1.0 0.87941
1.0 -0.31225476 1.0 -0.8532559
-1.0 -1.0 1.0 -0.9779148
rewards -0.45857675986175894
turbulence 24.71999931335449
trade: 2010
cost: 3197.1548198642804
-1.0 -0.78931564 -1.0 0.94271064
-1.0 0.24460007 -1.0 0.98737717
-1.0 -0.020701438 1.0 -0.89347464
-1.0 0.13120651 -1.0 0.9633529
0.27017602 0.9411412 1.0 0.8793278
-1.0 -0.42990446 -1.0 0.8336079
-1.0 0.87478316 1.0 0.84943163
-0.63824 -1.0 1.0 -0.36253297
0.44101357 -0.7198156 1.0 -0.8193784
-1.0 -0.07433235 -1.0 -0.95417506
1.0 -1.0 1.0 -0.19754565
-1.0 -1.0 -1.0 -0.97447836
1.0 0.1114868 1.0 0.798471
1.0 -1.0 1.0 -0.96917975
1.0 -0.45508134 1.0 -0.893519
1.0 -0.712176 1.0 0.95702577
```

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1.0 0.34661633 1.0 0.9722166
1.0 1.0 1.0 0.7740942
1.0 -0.72266865 -1.0 -0.96656114
1.0 0.2813068 -1.0 -0.9689964
0.44871888 0.1296293 -1.0 0.9473014
0.09023422 1.0 -1.0 0.9182615
-1.0 -1.0 -1.0 -0.98970354
1.0 1.0 -1.0 0.99926925
-0.82728636 1.0 1.0 -0.6109102
1.0 0.2731148 -1.0 -0.7243705
1.0 -1.0 1.0 -0.26347542
1.0 1.0 1.0 -0.9709156
-1.0 1.0 1.0 -0.95741117
rewards 2.380740069471742
turbulence 22.88999938964844
trade: 2024
cost: 3205.845506219871
-1.0 -0.18075608 -1.0 0.94046426
-1.0 0.7122685 -1.0 0.09598422
-1.0 -1.0 1.0 -0.34831977
-1.0 1.0 -1.0 0.98151183
-1.0 -0.5826941 1.0 0.7797177
-1.0 -0.07279158 -1.0 0.9511609
0.18294024 -1.0 1.0 0.9093015
1.0 -1.0 1.0 -0.4632051
-1.0 -0.98493624 1.0 -0.9616524
-1.0 -1.0 -1.0 0.05347371
1.0 1.0 1.0 0.84310997
-1.0 -0.03820792 -1.0 -0.9608819
1.0 0.98281556 1.0 0.108820796
1.0 -0.38681996 1.0 -0.95779616
1.0 -0.23970951 1.0 -0.97112113
0.7490853 0.50791764 1.0 -0.12817836
-0.07478559 -1.0 1.0 0.9961448
1.0 0.8424696 1.0 0.98715734
1.0 -1.0 -1.0 -0.8349669
1.0 -0.4663988 -1.0 -0.8394009
-0.98131853 -1.0 -1.0 0.8868934
-1.0 0.14108393 -1.0 0.69038343
-1.0 -0.9300263 -1.0 -0.7557268
1.0 0.850838 -1.0 0.9163277
0.24296683 -1.0 1.0 -0.9120102
1.0 -1.0 -1.0 0.05419314
1.0 -1.0 1.0 0.8763491
0.01221576 0.6256299 1.0 -0.83565027
-1.0 1.0 1.0 -0.8960081
rewards 0.0926444421386812
turbulence 22.5
```

```
trade: 2040
cost: 3220.4740027713847
-0.98240614 -0.07830912 -1.0 0.8484473
-1.0 0.970131 -1.0 0.7023827
-1.0 -1.0 1.0 -0.43547404
-1.0 1.0 -1.0 0.99634147
0.17477433 0.4268707 1.0 0.8704356
-0.07903504 0.42029083 -1.0 0.9039631
1.0 -0.052969128 1.0 0.8774438
0.66100144 0.9239453 1.0 -0.75578785
-0.7155811 -0.91483706 1.0 -0.8508511
-1.0 0.83186865 -1.0 -0.24884802
1.0 -1.0 1.0 0.40746462
-1.0 0.11798901 -1.0 -0.97566366
0.28895068 0.53156596 1.0 0.8007517
1.0 1.0 1.0 -0.6988236
1.0 -0.5211636 1.0 -0.5751406
1.0 -1.0 1.0 0.38482916
1.0 -1.0 1.0 0.9930661
-0.44359016 0.783797 1.0 0.9881966
1.0 0.36992472 -1.0 -0.9812526
1.0 0.8293049 -1.0 -0.6376041
-1.0 0.6192167 -1.0 0.98733306
-1.0 1.0 -1.0 0.8633332
-1.0 -1.0 -1.0 -0.83554816
1.0 0.9458116 -1.0 0.94546604
1.0 1.0 1.0 -0.832764
1.0 0.7155201 -1.0 -0.95371526
1.0 0.48015776 1.0 0.7548411
-0.98073334 0.26677912 1.0 -0.94015425
-0.040565252 0.26327726 1.0 -0.95572346
rewards 0.4608784552501515
turbulence 21.93000030517578
trade: 2059
cost: 3222.9108858165814
-0.4766819 -0.69242847 -1.0 0.98509073
-0.9923277 0.14727068 -1.0 0.9364543
-1.0 1.0 1.0 -0.50540435
-1.0 0.5765754 -1.0 0.9754007
-0.5043333 -0.48244777 1.0 0.8733349
-0.56326115 -0.58056694 -1.0 0.84930694
1.0 0.8614565 1.0 0.9891715
0.7822341 1.0 1.0 -0.4286834
-0.6469459 1.0 1.0 -0.45058107
-1.0 -0.04535035 -1.0 -0.5970464
1.0 -1.0 1.0 0.93718874
-1.0 0.9010481 -1.0 -0.8616842
1.0 -0.22268882 1.0 0.9274254
```

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1.0 1.0 1.0 -0.8940778
1.0 0.12452389 1.0 -0.90024114
1.0 1.0 1.0 0.7514365
0.5037562 -0.40334442 1.0 0.99430406
-0.45161724 -0.04611373 1.0 0.9175625
1.0 0.40097904 -1.0 -0.99064344
1.0 -0.62618923 -1.0 -0.98385507
1.0 -0.31211182 -1.0 0.9922272
-1.0 0.48908895 -1.0 0.96948004
-1.0 -1.0 -1.0 -0.83676326
1.0 -1.0 -1.0 0.97865164
-1.0 -0.9987019 1.0 -0.5308758
1.0 0.4026358 -1.0 -0.9422682
1.0 -0.80939126 1.0 0.9737096
-0.2749198 1.0 1.0 -0.9568349
-1.0 1.0 1.0 -0.88540494
rewards -0.2747916828239337
turbulence 21.56999969482422
trade: 2076
cost: 3228.1861163082194
-0.7856187 -0.45022875 -1.0 0.98263526
-1.0 -1.0 -1.0 0.05597341
-1.0 -1.0 1.0 0.23856461
-0.4460665 -1.0 -1.0 0.9331291
0.86717284 -1.0 1.0 0.8384677
-1.0 0.49644482 -1.0 0.6392418
1.0 0.07725166 1.0 0.79706883
0.22807503 1.0 1.0 -0.8579923
-1.0 0.5622278 1.0 -0.78844434
-1.0 0.03463383 -1.0 -0.99623966
1.0 1.0 1.0 0.70165324
-1.0 1.0 -1.0 -0.9895287
1.0 1.0 1.0 0.5882273
1.0 1.0 1.0 -0.9894606
1.0 -0.6308229 1.0 -0.84996873
1.0 0.5459628 1.0 0.3907627
0.39878076 1.0 1.0 0.99272406
1.0 0.29158077 1.0 0.9828706
1.0 -0.1331584 -1.0 -0.9012764
1.0 -0.39851922 -1.0 -0.77380073
-0.73173046 0.44434366 -1.0 0.9764167
-1.0 0.20849742 -1.0 0.9447856
-1.0 0.58744615 -1.0 -0.9901979
1.0 1.0 -1.0 0.84561646
-1.0 -1.0 1.0 -0.6600268
1.0 0.059293665 -1.0 -0.8905601
1.0 -1.0 1.0 0.79476
0.19374746 -0.5579412 1.0 -0.9685389
```

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-1.0 -1.0 1.0 -0.94988865
rewards 1.2409429253970972
turbulence 25.15999984741211
trade: 2094
cost: 3252.854785615928
-0.7837002 -1.0 -1.0 0.98396814
-1.0 0.7656677 -1.0 0.94521475
-1.0 0.67435396 1.0 -0.7757082
-1.0 -1.0 -1.0 0.9204469
-0.32963812 1.0 1.0 0.89981604
-0.2095393 -0.50395393 -1.0 0.90431
0.82012063 1.0 1.0 0.98269963
1.0 1.0 1.0 -0.9609829
-0.37668583 -1.0 1.0 -0.90552104
-1.0 -1.0 -1.0 0.7584076
1.0 1.0 1.0 -0.6108518
-1.0 -1.0 -1.0 -0.7830334
0.83914185 1.0 1.0 -0.02475077
1.0 0.9470585 1.0 -0.95776844
1.0 0.6048932 1.0 -0.92100227
1.0 1.0 1.0 0.9953098
1.0 -1.0 1.0 0.84299564
1.0 -0.34152746 1.0 0.92231333
1.0 0.270733 -1.0 -0.9758118
1.0 1.0 -1.0 -0.983113
0.4965683 0.7864199 -1.0 0.9878323
0.41751292 -0.49497235 -1.0 0.97259915
-1.0 1.0 -1.0 -0.9380005
1.0 -0.43909383 -1.0 0.97113204
0.6486293 1.0 1.0 -0.94596636
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1.0 1.0 1.0 0.7439538
1.0 0.25164586 1.0 -0.96301746
-1.0 0.2746354 1.0 -0.94071215
rewards -0.6033166552734329
turbulence 24.229999542236328
trade: 2113
cost: 3271.9850682087017
0.8654603 1.0 -1.0 0.81448007
-1.0 0.18937477 -1.0 0.50273037
-1.0 -0.35871753 1.0 0.101445556
-1.0 -0.8957417 -1.0 0.9856143
-1.0 -0.18207358 1.0 0.7951975
-0.763786 -0.91697115 -1.0 0.9805125
-1.0 -1.0 1.0 0.8589717
1.0 -1.0 1.0 -0.8530937
0.34472647 -1.0 1.0 -0.47177297
-1.0 -0.6447985 -1.0 -0.63123083
```

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1.0 -0.9271232 1.0 0.984869
-0.17353392 1.0 -1.0 -0.90774953
1.0 0.649424 -1.0 -0.98052645
0.52809906 -0.07109161 -1.0 0.9921231
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-1.0 -0.3790937 -1.0 -0.90941274
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1.0 0.07492638 -1.0 -0.87163943
1.0 1.0 1.0 -0.4292823
0.28714815 -0.5458844 1.0 -0.9675403
-1.0 0.3981828 1.0 -0.86500114
rewards 0.252287801361084
turbulence 23.309999465942383
trade: 2127
cost: 3271.9850682087017
-1.0 -0.5473213 -1.0 0.9480071
-1.0 -0.3128214 -1.0 0.98026085
-1.0 -0.6006346 1.0 -0.9521326
-0.9360174 -0.4853047 -1.0 0.9697602
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1.0 -0.7001008 1.0 0.5650989
-1.0 1.0 -1.0 -0.57918143
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1.0 0.15310515 1.0 -0.9966177
1.0 0.71919966 1.0 -0.94402057
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1.0 -0.42864826 1.0 0.9712162
0.5307385 0.7235043 -1.0 -0.9722746
1.0 0.5855512 -1.0 -0.7032749
1.0 -1.0 -1.0 0.9824281
-1.0 -1.0 -1.0 0.991734
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```

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1.0 0.32324398 1.0 0.5428889
-0.83248615 0.19052935 1.0 -0.7713646
-1.0 0.27837074 1.0 -0.97189534
rewards 0.46472069162139673
turbulence 21.530000686645508
trade: 2141
cost: 3285.1768527088234
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-1.0 0.8300663 -1.0 0.8484715
-1.0 1.0 1.0 0.64322424
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1.0 0.22477525 1.0 0.7955773
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1.0 0.8379196 1.0 -0.96606874
0.69529736 -1.0 1.0 0.76289785
1.0 -0.9860194 1.0 0.99662375
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-1.0 -1.0 -1.0 0.98744655
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1.0 1.0 1.0 0.88024056
-0.12189695 0.47490287 1.0 -0.96846133
-1.0 -0.36246306 1.0 -0.9720611
rewards 1.0175927777824458
turbulence 21.700000762939453
trade: 2160
cost: 3298.4765300235817
-1.0 -1.0 -1.0 0.98458636
-1.0 0.50339544 -1.0 0.682078
-1.0 -1.0 1.0 -0.87444395
-1.0 -1.0 -1.0 0.9754368
0.94644 -0.38019317 1.0 0.3798008
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1.0 -0.1462335 1.0 0.99483347
```

```
1.0 -0.0037062913 1.0 -0.3605733
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1.0 0.22629207 1.0 0.59970737
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1.0 -1.0 1.0 -0.9767658
1.0 0.906338 1.0 0.6374705
1.0 1.0 1.0 0.97765136
0.40868855 -0.12451413 1.0 0.9391067
1.0 -0.35917547 -1.0 -0.9386941
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-1.0 0.8820872 -1.0 -0.8706149
1.0 -1.0 -1.0 0.98806787
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1.0 -1.0 -1.0 -0.992536
1.0 1.0 1.0 0.8947792
1.0 1.0 1.0 -0.8726407
-1.0 -0.078529775 1.0 -0.97109526
rewards -0.7874104650909314
turbulence 23.07999992370605
trade: 2176
cost: 3316.6097148685526
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1.0 1.0 1.0 0.9917028
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1.0 -0.095727496 -1.0 -0.91217893
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```

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-1.0 0.26164097 -1.0 -0.9429475
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1.0 1.0 -1.0 -0.97257084
1.0 1.0 1.0 0.26293135
0.35930648 0.10298544 1.0 -0.9464199
-1.0 -0.07843286 1.0 -0.97403765
rewards 0.12890357881353703
turbulence 22.770000457763672
trade: 2192
cost: 3318.918248937614
0.037572384 -0.45196274 -1.0 0.92953825
-1.0 1.0 -1.0 0.90029716
-1.0 0.66304374 1.0 -0.41154605
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1.0 1.0 1.0 -0.990307
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1.0 0.1675918 1.0 0.9947319
1.0 1.0 1.0 0.96932817
1.0 -0.30039802 -1.0 -0.80814016
1.0 1.0 -1.0 -0.8567173
-0.7917794 1.0 -1.0 0.9580214
0.2900657 0.66527927 -1.0 0.9559283
-1.0 0.76667404 -1.0 -0.71540546
1.0 -1.0 -1.0 0.9154546
0.14659941 -1.0 1.0 -0.73886275
1.0 1.0 -1.0 -0.97388464
1.0 1.0 1.0 -0.35235524
0.70818514 1.0 1.0 -0.9874342
-1.0 0.15478408 1.0 -0.94380105
rewards 0.7109468318939209
turbulence 22.75
trade: 2209
cost: 3318.918248937614
-0.28980345 0.25093937 -1.0 0.91646564
-1.0 0.8823436 -1.0 0.94383454
-1.0 -0.13646635 1.0 -0.8895944
-1.0 -1.0 -1.0 0.9890132
```

```
-1.0 1.0 1.0 0.5974163
-1.0 1.0 -1.0 0.75424147
-0.4512589 0.8203455 1.0 0.94030416
1.0 1.0 1.0 0.39863658
0.16703394 -1.0 1.0 -0.9768412
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1.0 1.0 1.0 0.14259028
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1.0 0.68101937 1.0 -0.9943151
1.0 0.31204322 1.0 0.6270392
1.0 -0.819911 1.0 0.95352554
1.0 0.71975505 1.0 0.7640922
1.0 -0.05162784 -1.0 -0.97234654
1.0 1.0 -1.0 -0.9427564
0.93226427 -1.0 -1.0 0.98218274
1.0 0.12276604 -1.0 0.9165747
-1.0 -1.0 -1.0 -0.68102896
1.0 1.0 -1.0 0.92287576
-0.20902008 -0.078431115 1.0 -0.91962373
1.0 -0.5982916 -1.0 -0.8925681
1.0 -0.20025843 1.0 0.8517331
-0.026912415 0.9572536 1.0 -0.98269176
-1.0 -0.03404537 1.0 -0.98004806
rewards -2.5081877006530764
turbulence 26.96999931335449
trade: 2225
cost: 3318.918248937614
-0.5633852 -0.07972151 -1.0 0.76685214
-1.0 0.24276201 -1.0 -0.42299128
-1.0 0.2907737 1.0 -0.8238409
-1.0 -0.43300176 -1.0 0.97798526
0.44586036 -0.5860206 1.0 0.93626165
-0.93730724 -0.11244403 -1.0 0.9052907
-0.9418622 0.55583316 1.0 0.8739066
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1.0 1.0 1.0 0.39594758
-1.0 -0.32512063 -1.0 -0.8408975
1.0 1.0 1.0 -0.5981531
1.0 0.72049093 1.0 -0.91235244
1.0 -0.74668133 1.0 -0.6361389
1.0 0.9345151 1.0 0.27877855
1.0 0.36744943 1.0 0.8999586
-0.039986968 0.69540584 1.0 0.94757223
1.0 0.5540593 -1.0 -0.9747563
```

```
1.0 -0.32224384 -1.0 -0.6479465
-0.87048763 -1.0 -1.0 0.98913956
0.11123359 -1.0 -1.0 0.92515457
-1.0 -1.0 -1.0 -0.98366266
1.0 1.0 -1.0 0.85291755
1.0 -1.0 1.0 -0.8839137
1.0 0.69459623 -1.0 -0.9317699
1.0 1.0 1.0 0.78903997
0.14640446 0.709126 1.0 -0.8820057
-0.50929785 -0.42056185 1.0 -0.9934974
rewards 0.15723802030563822
turbulence 25.34000015258789
trade: 2239
cost: 3332.994222639091
-0.93713766 -0.36626667 -1.0 0.9694686
-1.0 -0.01775916 -1.0 0.74971795
-1.0 -0.9520588 1.0 -0.9722592
-1.0 -1.0 -1.0 0.9643216
0.24001063 0.98083395 1.0 0.8513504
-1.0 1.0 -1.0 0.97558427
0.057057083 -0.40942696 1.0 0.9276378
1.0 -1.0 1.0 0.055277944
-1.0 -1.0 1.0 -0.6690215
-1.0 -0.494907 -1.0 -0.4981897
1.0 1.0 1.0 0.27600157
-1.0 -0.5566932 -1.0 -0.9552515
1.0 1.0 1.0 0.20624316
1.0 -0.64062905 1.0 -0.9668236
1.0 -1.0 1.0 -0.9430062
1.0 1.0 1.0 0.67111886
1.0 -0.5850524 1.0 0.873919
0.8626951 1.0 1.0 0.86206746
1.0 1.0 -1.0 -0.8969296
1.0 1.0 -1.0 -0.9555771
-1.0 0.28364858 -1.0 0.96635807
1.0 -1.0 -1.0 0.98925304
-1.0 -0.32921284 -1.0 -0.89950466
1.0 0.20355287 -1.0 0.9652369
-0.8707564 1.0 1.0 -0.9792039
1.0 -1.0 -1.0 -0.9503622
1.0 1.0 1.0 0.64573205
0.08444838 1.0 1.0 -0.9695313
-1.0 -1.0 1.0 -0.9831729
rewards 1.5658697829483077
turbulence 25.06999969482422
trade: 2254
cost: 3336.8575427532264
-1.0 -0.026860505 -1.0 0.949687
```

```
-1.0 1.0 -1.0 0.88591313
-1.0 -0.70059127 1.0 -0.8264489
-1.0 0.7108828 -1.0 0.98393345
0.18532458 1.0 1.0 0.9136425
-1.0 -0.9133961 -1.0 0.8817657
-0.014499426 -0.66148865 1.0 0.9588851
1.0 1.0 1.0 -0.5674869
-0.10652409 0.076930955 1.0 -0.3444432
-1.0 -0.667605 -1.0 -0.55940723
1.0 -0.20859371 1.0 0.9595144
-1.0 -0.14165331 -1.0 -0.94860035
1.0 0.56648463 1.0 -0.71983725
1.0 1.0 1.0 -0.92640126
1.0 1.0 1.0 -0.9765753
1.0 1.0 1.0 0.6985991
1.0 0.2662124 1.0 0.9971757
1.0 -1.0 1.0 0.8536341
1.0 -1.0 -1.0 -0.9793221
1.0 -1.0 -1.0 -0.93112755
0.39260733 0.3860548 -1.0 0.9874407
-1.0 0.75843775 -1.0 0.96939576
-1.0 0.63810205 -1.0 -0.81281304
1.0 -1.0 -1.0 0.9428021
-0.27600178 -0.92414826 1.0 -0.075496614
1.0 -1.0 -1.0 -0.76847667
1.0 0.48774618 1.0 0.65689886
0.82737505 1.0 1.0 -0.97428846
-1.0 -1.0 1.0 -0.9779785
rewards 1.5819878451427445
turbulence 22.3700008392334
trade: 2272
cost: 3338.6148335132666
-0.5404124 -1.0 -1.0 0.9685695
-1.0 1.0 -1.0 0.14223099
-1.0 1.0 1.0 -0.4372537
-1.0 -1.0 -1.0 0.96983707
-0.4326812 -0.17800385 1.0 0.9636898
-0.61677563 0.062231794 -1.0 0.981822
0.46472296 -0.8161199 1.0 0.9842136
-1.0 -0.43664265 1.0 -0.60765636
0.5045568 1.0 1.0 -0.9587261
-1.0 -0.20930994 -1.0 -0.59384096
1.0 -1.0 1.0 -0.62413025
-1.0 0.018991947 -1.0 -0.9679593
0.92862767 1.0 1.0 0.8856214
1.0 -0.29606718 1.0 -0.9951933
1.0 1.0 1.0 -0.9457615
1.0 -0.9576876 1.0 0.89217293
```

```
1.0 -1.0 1.0 0.98078334
0.4564135 -0.2650631 1.0 0.98578393
1.0 1.0 -1.0 -0.8115186
1.0 -1.0 -1.0 -0.75034034
0.9347989 -0.61562973 -1.0 0.9226961
-0.8961387 0.8211705 -1.0 0.9265578
-1.0 -0.19828212 -1.0 -0.8649951
1.0 0.19120304 -1.0 0.99624586
-1.0 1.0 1.0 -0.8764196
1.0 1.0 -1.0 -0.68522346
1.0 -1.0 1.0 0.71488
-0.7841676 -1.0 1.0 -0.8956815
-1.0 -0.43403262 1.0 -0.97132784
rewards 0.7543642096469878
turbulence 21.559999465942383
trade: 2288
cost: 3347.5295417003704
-1.0 -1.0 -1.0 0.9221616
-1.0 -0.8002937 -1.0 0.9552884
-1.0 -1.0 1.0 -0.8189488
-1.0 -0.4882872 -1.0 0.87126136
-1.0 0.1552818 1.0 0.7799611
-1.0 0.038065627 -1.0 0.94635034
0.749597 -1.0 1.0 0.97272503
0.43045044 1.0 1.0 -0.31499362
1.0 1.0 1.0 -0.9646765
-1.0 -1.0 -1.0 -0.8903807
1.0 -1.0 1.0 -0.947768
-1.0 -1.0 -1.0 -0.7937277
1.0 1.0 1.0 0.8751458
1.0 1.0 1.0 -0.9668549
0.518626 -1.0 1.0 -0.88806957
1.0 -0.9665569 1.0 0.80409765
1.0 -0.9967252 1.0 0.8967385
1.0 0.41095585 1.0 0.81326234
1.0 -1.0 -1.0 -0.9466875
1.0 0.5657631 -1.0 -0.9979307
0.7909154 -1.0 -1.0 0.90450835
1.0 0.8349173 -1.0 0.97980046
-1.0 1.0 -1.0 -0.954789
1.0 -0.009391546 -1.0 0.9663005
-1.0 0.8364798 1.0 -0.8981268
1.0 -0.21244474 -1.0 -0.56796646
1.0 -0.09923321 1.0 0.42210722
0.26020426 0.53102005 1.0 -0.7881149
-1.0 -0.45752144 1.0 -0.9739316
rewards -0.9217865388694685
turbulence 24.07999992370605
```

```
trade: 2304
cost: 3355.309908422477
-0.8205948 -1.0 -1.0 0.8590007
-1.0 -1.0 -1.0 0.4888203
-1.0 -0.66016185 1.0 -0.39386874
0.19197989 1.0 -1.0 0.97966516
-0.081824444 0.5066196 1.0 0.8782172
0.16805482 0.67032313 -1.0 0.9002025
1.0 1.0 1.0 0.88055384
1.0 1.0 1.0 0.7721181
-1.0 0.2262994 1.0 -0.8674222
-1.0 -1.0 -1.0 -0.3517977
1.0 -0.7365235 1.0 0.44129097
-1.0 0.7122266 -1.0 -0.98695135
1.0 0.032453902 1.0 0.5945003
1.0 -0.50613785 1.0 -0.97880524
1.0 0.120000646 1.0 -0.99176073
1.0 0.010137051 1.0 0.9866662
1.0 -0.5116304 1.0 0.99174666
1.0 -0.6326522 1.0 0.95121455
1.0 -0.650156 -1.0 -0.9550075
1.0 1.0 -1.0 -0.9017689
-1.0 0.81554514 -1.0 0.99514353
0.3689569 -0.5981104 -1.0 0.43870175
-1.0 1.0 -1.0 -0.9893704
1.0 0.113595456 -1.0 0.9932556
-1.0 1.0 1.0 -0.9155193
1.0 0.28547758 -1.0 -0.88720405
1.0 -0.59744954 1.0 -0.3716396
0.9652084 -0.13236013 1.0 -0.9324454
-1.0 1.0 1.0 -0.95939815
rewards 0.6474915559085784
turbulence 23.32999992370605
trade: 2321
cost: 3366.4520771503517
-1.0 -1.0 -1.0 0.95390356
-1.0 0.9879292 -1.0 0.51844454
-1.0 -0.39246824 1.0 0.2805562
-1.0 1.0 -1.0 0.9610292
0.5780205 0.7497389 1.0 0.9045403
-1.0 -0.920411 -1.0 0.59036493
0.3631996 0.69165266 1.0 0.94831944
1.0 0.61237645 1.0 -0.2734654
1.0 1.0 1.0 -0.99183923
-1.0 -0.9432093 -1.0 -0.63157845
1.0 -1.0 1.0 -0.81132644
-1.0 0.7044499 -1.0 -0.97373843
1.0 1.0 1.0 -0.27144474
```

```
1.0 0.37300217 1.0 -0.94476897
1.0 -1.0 1.0 -0.9396801
1.0 0.93397593 1.0 0.7566582
0.52238953 0.19911647 1.0 0.96660495
0.21967351 -1.0 1.0 0.9365201
1.0 0.34594148 -1.0 -0.9407536
1.0 -0.5962017 -1.0 -0.9742039
1.0 -0.4385495 -1.0 0.98638487
-1.0 -0.33687326 -1.0 0.981658
-1.0 -1.0 -1.0 -0.43402833
1.0 -0.08643961 -1.0 0.9597386
1.0 1.0 1.0 -0.9603584
1.0 -0.066940375 -1.0 -0.97521955
1.0 1.0 1.0 0.44471037
-0.6184473 1.0 1.0 -0.9713165
-1.0 -0.49873796 1.0 -0.9607565
rewards 0.33598550059508997
turbulence 22.209999084472656
trade: 2340
cost: 3386.6135621357034
-0.47025317 -0.07637316 -1.0 0.9580445
-1.0 -1.0 -1.0 0.9265388
-1.0 -0.13773328 1.0 -0.36914635
-1.0 -0.36109877 -1.0 0.8113322
-1.0 -0.24097122 1.0 0.9139707
0.2411499 1.0 -1.0 0.9410088
0.19627976 0.1958608 1.0 0.9646764
0.5965229 0.468131 1.0 -0.99036765
-0.227563 0.25924802 1.0 -0.99142224
-1.0 -0.8576348 -1.0 0.32377756
1.0 1.0 1.0 -0.284644
-1.0 0.32617915 -1.0 -0.8675316
1.0 1.0 1.0 0.74681735
1.0 1.0 1.0 -0.91279584
1.0 -1.0 1.0 -0.8657566
1.0 0.04319714 1.0 0.72238266
0.85087204 0.51148325 1.0 0.9224304
1.0 1.0 1.0 0.84538174
1.0 -1.0 -1.0 -0.9097364
1.0 -0.6645827 -1.0 -0.98483586
-1.0 1.0 -1.0 0.991369
-1.0 0.97110856 -1.0 0.9369954
-1.0 -1.0 -1.0 -0.9243167
1.0 -1.0 -1.0 0.9968889
-0.5503937 -0.14776486 1.0 -0.75867045
1.0 -1.0 -1.0 -0.75425106
1.0 -0.67505443 1.0 0.9805261
1.0 1.0 1.0 -0.9848114
```

```
-1.0 0.6042908 1.0 -0.95132524
rewards -0.6945974083267152
turbulence 23.25
trade: 2356
cost: 3388.164500108726
-1.0 -1.0 -1.0 0.9749799
-1.0 0.17813447 -1.0 -0.2589836
-1.0 -1.0 1.0 -0.34443015
-0.4386524 1.0 -1.0 0.96766114
1.0 -0.5149439 1.0 0.9807718
-1.0 0.2340166 -1.0 0.9886844
1.0 -0.5514659 1.0 0.9972062
1.0 -0.030178621 1.0 -0.7745953
-0.27778256 -0.17880303 1.0 -0.8809925
-1.0 -1.0 -1.0 -0.031778455
1.0 -0.34639484 1.0 0.63686943
-1.0 1.0 -1.0 -0.94558686
1.0 -0.91488314 1.0 0.90130115
1.0 0.3431071 1.0 -0.98288643
1.0 0.23635472 1.0 -0.9857295
1.0 1.0 1.0 0.68711317
1.0 -1.0 1.0 0.95857036
1.0 0.9717766 1.0 0.96610844
0.9326115 -1.0 -1.0 -0.9828755
1.0 -1.0 -1.0 -0.9179298
1.0 -0.046206027 -1.0 0.98203695
0.1220452 0.3648273 -1.0 0.97230494
-1.0 -0.80405074 -1.0 -0.9911453
1.0 1.0 -1.0 0.9331763
0.29387623 -0.7973104 1.0 -0.73396355
1.0 1.0 -1.0 -0.8837986
1.0 -0.6941626 1.0 0.18526864
1.0 -1.0 1.0 -0.865502
-1.0 -1.0 1.0 -0.97922045
rewards -0.34578786147309004
turbulence 24.34000015258789
trade: 2372
cost: 3395.7696620807715
-0.26653206 0.7388154 -1.0 0.956229
-1.0 1.0 -1.0 0.68463933
-1.0 1.0 1.0 -0.8796388
-1.0 0.01792489 -1.0 0.9887599
-0.6453608 0.99619085 1.0 0.88003147
-1.0 0.5475475 -1.0 0.8201091
1.0 1.0 1.0 0.94895506
1.0 -0.252591 1.0 -0.46236992
1.0 0.5484611 1.0 -0.9514894
-1.0 1.0 -1.0 0.09499049
```

```
1.0 -0.8830445 1.0 -0.6501075
-1.0 0.27308106 -1.0 -0.97614986
1.0 -0.4525544 1.0 0.85596704
1.0 1.0 1.0 -0.9813092
1.0 0.94553685 1.0 -0.9482895
1.0 -0.6752677 1.0 0.9970914
0.5658294 -1.0 1.0 0.992852
1.0 -0.38921687 1.0 0.92497396
0.21293843 -1.0 -1.0 -0.9722828
1.0 1.0 -1.0 -0.7718806
1.0 -0.50615853 -1.0 0.9949825
1.0 1.0 -1.0 0.99928
-1.0 1.0 -1.0 -0.879018
1.0 0.26888865 -1.0 0.99015343
1.0 -0.73849654 1.0 -0.96161467
1.0 0.61995256 -1.0 -0.95153546
1.0 0.002673 1.0 0.5226338
0.58866775 0.66157174 1.0 -0.9732916
-1.0 -0.5863303 1.0 -0.9514295
rewards 0.2516480846405029
turbulence 23.239999771118164
trade: 2391
cost: 3395.7696620807715
0.6613289 1.0 -1.0 0.9463471
-1.0 -0.31951922 -1.0 0.61203194
-1.0 0.7247052 1.0 -0.9683433
-1.0 0.22864905 -1.0 0.98813033
-0.64770424 0.1291848 1.0 0.9379597
-1.0 -0.8469757 -1.0 0.90939546
-0.15965801 0.44907558 1.0 0.9949527
-0.24336123 0.5088345 1.0 -0.9349381
-0.58314914 0.8801255 1.0 -0.8801253
-1.0 -0.8309295 -1.0 -0.6578478
1.0 -1.0 1.0 -0.8065248
-1.0 0.81107306 -1.0 -0.973284
-0.5343598 1.0 1.0 0.82840633
1.0 -0.95252395 1.0 -0.90570945
1.0 -1.0 1.0 -0.91129214
1.0 -0.5847343 1.0 0.27889585
1.0 -1.0 1.0 0.9960606
1.0 0.6438364 1.0 0.9448676
1.0 1.0 -1.0 -0.98743236
1.0 -0.079157785 -1.0 -0.97637117
-1.0 -0.22505797 -1.0 0.98446894
-0.2465559 1.0 -1.0 0.97733474
-1.0 1.0 -1.0 -0.83804584
1.0 -1.0 -1.0 0.9833611
1.0 0.3908134 1.0 -0.73903096
```

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1.0 -0.09623425 -1.0 -0.9677775
1.0 1.0 1.0 0.74479795
-0.3702747 -0.66535866 1.0 -0.97462475
-1.0 -0.2707673 1.0 -0.9909046
rewards 1.8264745961456328
turbulence 21.57999992370605
trade: 2406
cost: 3407.999832063682
-1.0 -1.0 -1.0 0.77173567
-1.0 1.0 -1.0 -0.8151763
-0.78954184 1.0 1.0 -0.6752101
-1.0 0.5680838 -1.0 0.96301174
-0.3824009 -0.018201105 1.0 0.852402
-1.0 0.6375941 -1.0 0.42519903
-0.78815347 -1.0 1.0 0.99263334
1.0 0.9617603 1.0 -0.2512867
0.68543696 -1.0 1.0 -0.9509414
-1.0 0.0863076 -1.0 0.5918602
1.0 1.0 1.0 0.24785566
-1.0 -1.0 -1.0 -0.9450761
0.74778813 -0.52374274 1.0 0.9462445
1.0 1.0 1.0 -0.98516273
1.0 0.49616736 1.0 -0.88777894
1.0 0.7812434 1.0 0.95098734
0.65114015 0.2903516 1.0 0.94971085
1.0 0.57865614 1.0 0.9628235
1.0 1.0 -1.0 -0.889265
1.0 1.0 -1.0 -0.99350667
-0.6710343 0.44467854 -1.0 0.9665582
0.74442893 0.63263476 -1.0 0.97600245
-1.0 0.85393447 -1.0 -0.776955
1.0 1.0 -1.0 0.9560337
-1.0 0.5391424 1.0 -0.9182891
1.0 1.0 -1.0 -0.6294818
1.0 1.0 1.0 0.75249994
-0.07614151 -0.023174077 1.0 -0.9121667
-1.0 -0.98445123 1.0 -0.9716694
rewards 1.1076735196655152
turbulence 21.31999969482422
trade: 2424
cost: 3415.768057191856
-1.0 -0.5604346 -1.0 0.9354074
-1.0 1.0 -1.0 0.37364864
-1.0 -1.0 1.0 -0.9647643
-1.0 1.0 -1.0 0.95093846
-0.4751528 -0.2872228 1.0 0.84871316
0.0058122873 -0.5677753 -1.0 0.96935487
1.0 1.0 1.0 0.9928627
```

```
0.57570946 -1.0 1.0 -0.87849116
-0.5044409 1.0 1.0 -0.9207307
-1.0 -0.15904321 -1.0 -0.86629534
1.0 1.0 1.0 0.8217708
-1.0 -0.30356795 -1.0 -0.92621964
1.0 0.99200547 1.0 0.24459124
1.0 0.028238952 1.0 -0.9608694
1.0 -0.44629443 1.0 -0.955723
1.0 -1.0 1.0 -0.057421863
1.0 -0.22880569 1.0 0.73696375
0.8492273 -1.0 1.0 0.9594842
1.0 -0.036986444 -1.0 -0.87341744
1.0 1.0 -1.0 -0.88624185
0.040232386 0.18583964 -1.0 0.9547539
0.8722674 1.0 -1.0 0.98892736
-1.0 1.0 -1.0 -0.9818702
1.0 0.15798843 -1.0 0.9623327
1.0 -1.0 1.0 -0.82998395
1.0 -1.0 -1.0 -0.9161186
1.0 1.0 1.0 0.5764266
0.25488746 0.22130316 1.0 -0.77665764
-1.0 -1.0 1.0 -0.99755687
rewards -1.0046107566390885
turbulence 21.90999984741211
trade: 2441
cost: 3422.149045824058
-1.0 -1.0 -1.0 0.86836565
-1.0 0.85979015 -1.0 0.4069394
-1.0 -1.0 1.0 0.16825771
-1.0 0.78630626 -1.0 0.96832335
0.9496868 1.0 1.0 0.7515758
-0.124031305 -0.12909797 -1.0 0.9207932
1.0 -0.27474216 1.0 0.8983257
1.0 -0.31750005 1.0 -0.8929961
-0.7785527 -0.827511 1.0 -0.9692337
-1.0 -0.1665616 -1.0 0.6984203
1.0 1.0 1.0 -0.43004763
-1.0 -1.0 -1.0 -0.69870764
1.0 -0.1301763 1.0 0.27127194
1.0 -0.33695543 1.0 -0.89018077
1.0 -0.698005 1.0 -0.95986444
1.0 0.4517578 1.0 0.7417047
1.0 1.0 1.0 0.9696218
1.0 -1.0 1.0 0.99324155
0.891689 1.0 -1.0 -0.99540335
1.0 -1.0 -1.0 -0.89007634
1.0 -0.7159138 -1.0 0.95919263
1.0 0.15978253 -1.0 0.98805285
```

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-1.0 -1.0 -1.0 -0.86419547
1.0 -0.88708025 -1.0 0.95088506
-0.108505785 1.0 1.0 -0.81259364
1.0 1.0 -1.0 -0.9665521
1.0 0.24810003 1.0 0.9682028
-1.0 1.0 1.0 -0.95674044
-1.0 -1.0 1.0 -0.9770218
rewards 0.04404966940155719
turbulence 23.190000534057617
trade: 2457
cost: 3433.050537538535
0.1999774 -1.0 -1.0 0.93450046
-1.0 0.64418954 -1.0 0.44578826
-1.0 -1.0 1.0 -0.66471297
-1.0 -1.0 -1.0 0.9981296
-1.0 -0.3340244 1.0 0.81883705
-1.0 1.0 -1.0 0.682444
0.28046376 1.0 1.0 0.9667487
1.0 -1.0 1.0 -0.98173505
1.0 0.7391267 1.0 -0.97180325
-1.0 -0.39118308 -1.0 -0.95522416
1.0 0.092721865 1.0 -0.80119574
-1.0 -0.0765176 -1.0 -0.72917384
0.8363853 -0.6287192 1.0 0.63926005
1.0 -0.5549461 1.0 -0.9833029
1.0 -1.0 1.0 -0.94288236
1.0 -1.0 1.0 0.33969474
1.0 -1.0 1.0 0.7771292
1.0 0.45265326 1.0 0.96105635
1.0 1.0 -1.0 -0.9203243
1.0 0.7918445 -1.0 -0.99330795
-0.0630887 0.5367814 -1.0 0.99544024
-0.29749 -1.0 -1.0 0.8878064
-1.0 -0.51042795 -1.0 -0.5458096
1.0 -0.73118055 -1.0 0.9557922
0.28207707 0.4291922 1.0 -0.4317199
1.0 0.83768976 -1.0 -0.7092031
1.0 -0.105330706 1.0 0.86070323
-0.9257252 0.85261184 1.0 -0.92913544
-1.0 1.0 1.0 -0.9899064
rewards -0.6876709891128587
turbulence 23.020000457763672
trade: 2474
cost: 3450.8363869190284
-1.0 -0.09985483 -1.0 0.95634496
-1.0 -0.7092682 -1.0 0.78600097
-1.0 0.7376186 1.0 -0.4934758
-0.39833164 -1.0 -1.0 0.9882934
```

```
1.0 -1.0 1.0 0.5741315
-0.3868571 -0.15024668 -1.0 0.9320265
1.0 1.0 1.0 0.9981588
0.3279034 -1.0 1.0 0.9030366
0.42597863 0.20910457 1.0 -0.93915474
-1.0 -0.449899 -1.0 -0.7673592
1.0 0.12533195 1.0 0.011970043
-1.0 0.447648 -1.0 -0.9111404
0.4152547 0.35160124 1.0 0.5561671
1.0 -1.0 1.0 -0.9780699
1.0 -0.22911717 1.0 -0.56680316
1.0 -1.0 1.0 0.9190283
1.0 -0.14453413 1.0 0.7321758
1.0 -0.25484845 1.0 0.9024168
0.5792023 -1.0 -1.0 -0.8140664
1.0 -0.7508592 -1.0 -0.951191
-0.77356523 0.7397125 -1.0 0.99378586
-0.6365336 -0.88500774 -1.0 0.88740623
-1.0 0.42540973 -1.0 -0.8750954
1.0 1.0 -1.0 0.98404646
-0.27971408 1.0 1.0 -0.9871402
1.0 -0.27691665 -1.0 -0.66040987
1.0 0.3541135 1.0 0.5686116
0.99812835 1.0 1.0 -0.9884153
-1.0 -0.71519315 1.0 -0.8876452
rewards -2.6635182782073974
turbulence 37.209999084472656
trade: 2490
cost: 3463.592796464927
-1.0 0.9878932 -1.0 0.98775196
-0.7533752 -1.0 -1.0 0.8113458
-1.0 0.7230146 1.0 -0.9437586
-1.0 -0.51976097 -1.0 0.96637344
0.4325018 -1.0 1.0 0.26632714
0.88240993 1.0 -1.0 0.91492546
1.0 0.26818204 1.0 0.9617686
1.0 0.0057006776 1.0 -0.5074333
-0.9423239 1.0 1.0 -0.8267712
-1.0 -1.0 -1.0 -0.75230414
1.0 -0.58037955 1.0 0.73600626
-1.0 0.5815474 -1.0 -0.84587705
1.0 -0.6461994 1.0 0.9437144
1.0 -0.83887565 1.0 -0.9711964
1.0 0.10415712 1.0 -0.94637465
1.0 -0.111471236 1.0 0.37715077
1.0 -0.53698 1.0 0.99547386
1.0 1.0 1.0 0.983438
1.0 5.8198348e-06 -1.0 -0.96940863
```

```
1.0 -0.98607486 -1.0 -0.7325938
1.0 1.0 -1.0 0.99188066
1.0 -1.0 -1.0 0.915331
-1.0 -0.28647196 -1.0 -0.88030684
1.0 1.0 -1.0 0.987609
-1.0 -0.047959447 1.0 -0.95571506
1.0 0.48687202 -1.0 -0.91289544
1.0 -1.0 1.0 0.84192944
-0.14341745 -1.0 1.0 -0.9923467
-1.0 -1.0 1.0 -0.9840684
rewards 1.4363041348415428
turbulence 30.209999084472656
trade: 2506
cost: 3463.6802017116615
-1.0 1.0 -1.0 0.9601667
-1.0 -0.5108999 -1.0 0.10115552
-1.0 0.608788 1.0 -0.32199973
-1.0 0.18384728 -1.0 0.94672287
0.13394362 -0.9907336 1.0 0.25520575
-1.0 -0.08015779 -1.0 0.16024327
-0.5965871 -1.0 1.0 0.9581362
0.8589731 -0.7395402 1.0 -0.52744365
-0.2991883 0.7212944 1.0 0.21986341
-1.0 -1.0 -1.0 -0.58174217
1.0 1.0 1.0 0.034086585
-1.0 -1.0 -1.0 -0.98742497
1.0 1.0 1.0 -0.41315436
1.0 1.0 1.0 -0.9322436
1.0 0.9513138 1.0 -0.90472484
1.0 1.0 1.0 0.0032606125
0.105243504 -1.0 1.0 0.97101545
1.0 -0.35119078 1.0 0.778883
1.0 -1.0 -1.0 -0.94087064
1.0 -1.0 -1.0 -0.83317506
-0.034152687 -1.0 -1.0 0.96772385
0.65038496 1.0 -1.0 0.95422244
-1.0 -1.0 -1.0 -0.8919151
1.0 -1.0 -1.0 0.989702
0.21155375 0.9344949 1.0 -0.9062689
1.0 -1.0 -1.0 -0.92133856
1.0 0.6254702 1.0 0.62833226
0.3252 1.0 1.0 -0.98557293
-1.0 -1.0 1.0 -0.66488475
rewards -2.523548713641358
turbulence 33.09000015258789
trade: 2524
cost: 3475.792139760978
-1.0 0.89430594 -1.0 0.97549844
```

```
-1.0 1.0 -1.0 -0.2522902
-1.0 0.40906727 1.0 0.7731714
-1.0 -0.454211 -1.0 0.95835567
1.0 -0.29825133 1.0 0.7578696
-1.0 1.0 -1.0 0.82840264
1.0 1.0 1.0 0.9287412
1.0 1.0 1.0 -0.5376141
-0.08823296 -0.9877635 1.0 -0.88541824
-1.0 -1.0 -1.0 0.8457875
1.0 1.0 1.0 0.32290697
-1.0 -0.35758403 -1.0 -0.99051505
1.0 1.0 1.0 0.43998003
1.0 0.8159634 1.0 -0.9635103
1.0 0.40820676 1.0 -0.940056
1.0 1.0 1.0 0.9665711
0.55352676 -0.46152395 1.0 0.9689338
1.0 1.0 1.0 0.9220464
1.0 0.5734623 -1.0 -0.98408586
1.0 -1.0 -1.0 -0.6120522
-0.124797955 0.48968375 -1.0 0.9970709
-0.10089397 0.9547436 -1.0 0.96658015
-1.0 0.1209417 -1.0 -0.9888611
1.0 1.0 -1.0 0.9099624
-1.0 -1.0 1.0 -0.8964204
1.0 0.867259 -1.0 -0.3989998
1.0 -0.8557883 1.0 0.5921929
1.0 -0.61525464 1.0 -0.7197051
-1.0 -1.0 1.0 -0.8748415
rewards 2.0466672061920166
turbulence 30.239999771118164
trade: 2541
cost: 3475.792139760978
-1.0 0.7323258 -1.0 0.9006729
0.49476767 -0.97018754 -1.0 0.40505052
-0.8841791 1.0 1.0 0.26848733
-1.0 0.6763149 -1.0 0.9942285
0.37227917 1.0 1.0 0.8198414
-1.0 -1.0 -1.0 0.52040684
1.0 1.0 1.0 0.91308165
-0.49332583 1.0 1.0 0.31599176
0.46368346 -0.53037584 1.0 -0.6519292
-1.0 0.33669087 -1.0 -0.7539944
1.0 -1.0 1.0 0.53612626
-1.0 0.11373548 -1.0 -0.9803497
1.0 0.07398899 1.0 0.96548057
1.0 -0.0029701293 1.0 -0.9769837
1.0 0.18730481 1.0 -0.94488513
-0.03925824 1.0 1.0 0.93333733
```

```
0.11904502 -1.0 1.0 0.95093083
1.0 -0.1402463 1.0 0.9727297
0.9160433 -0.39571276 -1.0 -0.99331224
1.0 -0.6715093 -1.0 -0.88174665
0.29278037 -0.0028099716 -1.0 0.97422683
1.0 0.33891347 -1.0 0.93579245
-1.0 0.886768 -1.0 -0.88079065
1.0 0.8387096 -1.0 0.9341712
0.31131515 -0.6638833 1.0 -0.9328793
1.0 -0.6504468 -1.0 -0.9420395
1.0 1.0 1.0 0.6639278
0.1355499 -0.6314515 1.0 -0.9614078
-1.0 1.0 1.0 -0.89596474
rewards 1.992196547317505
turbulence 25.559999465942383
trade: 2558
cost: 3475.792139760978
-1.0 0.4225321 -1.0 0.92794013
-1.0 -0.03769599 -1.0 0.89814794
-1.0 0.04623048 1.0 -0.6836196
-1.0 -1.0 -1.0 0.9112375
1.0 -0.684426 1.0 0.9442272
-1.0 0.7514599 -1.0 0.85089135
1.0 -1.0 1.0 0.9391787
1.0 -1.0 1.0 0.11359048
1.0 -0.1470327 1.0 -0.9323513
-1.0 1.0 -1.0 -0.4144981
1.0 -0.008612387 1.0 -0.87564224
-1.0 0.2224991 -1.0 -0.8757451
1.0 -0.829971 1.0 0.6066737
1.0 -0.7908418 1.0 -0.98422015
1.0 -0.29009664 1.0 -0.854083
1.0 -0.7169037 1.0 0.8300524
-0.4115156 0.98139143 1.0 0.9615736
1.0 -1.0 1.0 0.9119756
1.0 0.5429701 -1.0 -0.99462676
1.0 -0.584863 -1.0 -0.9307606
-0.6457486 -0.7255019 -1.0 0.87441695
-0.6811633 -0.16546723 -1.0 0.9879497
-1.0 -1.0 -1.0 -0.81152755
1.0 -0.9956876 -1.0 0.89613795
-0.8670772 -1.0 1.0 -0.65851474
1.0 -0.68699366 -1.0 -0.9601252
1.0 1.0 1.0 0.7397673
0.2936056 1.0 1.0 -0.9592698
-1.0 1.0 1.0 -0.8854697
rewards -0.19363331798401195
turbulence 22.90999984741211
```

```
trade: 2572
cost: 3488.4935446987224
-0.7854721 -0.43294662 -1.0 0.9966779
-0.3606335 0.2358693 -1.0 0.64392245
-1.0 0.1410192 1.0 -0.94282776
-1.0 1.0 -1.0 0.9662206
-0.15020949 -0.6730768 1.0 0.9155724
-1.0 1.0 -1.0 0.87070155
1.0 -0.12138605 1.0 0.97929716
1.0 1.0 1.0 -0.90504533
0.9730689 -1.0 1.0 -0.8557654
-1.0 -0.69653773 -1.0 -0.30519897
1.0 0.9969754 1.0 -0.7947695
-1.0 1.0 -1.0 -0.9786469
1.0 0.9806318 1.0 0.36399007
1.0 0.3478736 1.0 -0.90968996
1.0 -1.0 1.0 -0.9432188
1.0 -0.68067086 1.0 0.8310964
1.0 0.4314378 1.0 0.9862199
-0.08128202 0.3853829 1.0 0.9273958
1.0 -0.6217138 -1.0 -0.9791575
1.0 -0.18149747 -1.0 -0.84294826
-0.18860185 0.43494204 -1.0 0.98083353
1.0 -0.79744244 -1.0 0.90097356
-1.0 -1.0 -1.0 -0.8452662
1.0 -1.0 -1.0 0.932348
-0.3357362 -0.072044164 1.0 -0.85482174
1.0 -1.0 -1.0 -0.94848096
1.0 0.8581575 1.0 0.9462242
0.9902162 0.1701691 1.0 -0.9827772
-1.0 0.43814805 1.0 -0.99726033
rewards 2.236341126240534
turbulence 21.770000457763672
trade: 2590
cost: 3492.7065575008464
-1.0 -0.47843802 -1.0 0.9922334
-0.46805692 0.4508115 -1.0 0.8615819
-1.0 -0.13328391 1.0 -0.47548282
-1.0 -0.52925014 -1.0 0.9078376
-1.0 0.3835126 1.0 0.7106563
-1.0 1.0 -1.0 0.83904314
0.7933374 1.0 1.0 0.98169315
0.8853271 0.62201476 1.0 -0.8919853
0.7800213 0.7771975 1.0 -0.97177684
-1.0 0.50324714 -1.0 -0.8972885
1.0 0.54016083 1.0 -0.75796247
-1.0 0.34364143 -1.0 -0.74184257
-0.611925 1.0 1.0 0.8640332
```

```
1.0 1.0 1.0 -0.94728976
1.0 0.28283447 1.0 -0.9779328
1.0 -0.07275221 1.0 0.581476
1.0 -1.0 1.0 0.99126124
1.0 -1.0 1.0 0.723933
0.74216527 1.0 -1.0 -0.98907655
1.0 -0.59433115 -1.0 -0.74720895
-0.7911368 -0.1347393 -1.0 0.8478787
-0.3173678 -1.0 -1.0 0.96738076
-1.0 -1.0 -1.0 -0.98916066
1.0 -1.0 -1.0 0.9837693
1.0 0.9523795 1.0 -0.7861788
1.0 0.2204854 -1.0 -0.74676347
1.0 -1.0 1.0 0.80652773
0.33692455 -0.6994629 1.0 -0.96456337
-1.0 -1.0 1.0 -0.9962436
rewards 1.0929877454360948
turbulence 20.8700008392334
trade: 2610
cost: 3509.3605438747472
-1.0 -0.81021756 -1.0 0.8703203
-1.0 0.4695364 -1.0 0.79156804
-1.0 0.2799966 1.0 -0.955587
-0.6705378 1.0 -1.0 0.93495977
-0.07264159 0.98200655 1.0 0.76652336
0.53958225 -0.19599944 -1.0 0.94533384
1.0 -0.5108619 1.0 0.95594656
1.0 -0.03112121 1.0 0.623513
-1.0 -0.45126843 1.0 -0.47645116
-1.0 -0.77742666 -1.0 -0.96065843
1.0 -0.10512095 1.0 0.2504027
-1.0 -1.0 -1.0 -0.9494388
1.0 1.0 1.0 0.5222621
1.0 0.390562 1.0 -0.9773672
1.0 0.9007699 1.0 -0.976789
1.0 -0.4069521 1.0 0.8732197
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1.0 1.0 1.0 0.9842905
1.0 0.45681238 -1.0 -0.91091084
1.0 0.35029697 -1.0 -0.9169952
0.71235 -1.0 -1.0 0.9948108
-0.816223 0.38959825 -1.0 0.955014
-1.0 0.042664498 -1.0 -0.7970701
1.0 0.028337628 -1.0 0.8970877
-1.0 0.79120654 1.0 -0.75026554
1.0 1.0 -1.0 -0.7117753
1.0 0.58105606 1.0 0.83532107
0.09695036 0.46228558 1.0 -0.89738536
```

```
-1.0 0.77489746 1.0 -0.9802092
rewards 0.7773038836296182
turbulence 21.239999771118164
trade: 2629
cost: 3516.084524961478
-1.0 -0.6935313 -1.0 0.8023497
-1.0 1.0 -1.0 -0.3998661
-1.0 0.24778841 1.0 -0.110765696
-1.0 -1.0 -1.0 0.9428196
-0.8221595 0.5604025 1.0 0.12033737
-1.0 1.0 -1.0 0.64018965
-0.062938094 -0.8883421 1.0 0.7598959
0.6999429 1.0 1.0 -0.49358964
-0.4567257 0.39799947 1.0 -0.94604945
-1.0 0.31119573 -1.0 -0.79404956
1.0 -1.0 1.0 0.27711105
-1.0 -0.12686782 -1.0 -0.87354845
-0.89321077 -1.0 1.0 0.9020761
1.0 1.0 1.0 -0.9731876
1.0 -1.0 1.0 -0.9218669
0.6129607 0.8361908 1.0 0.5241636
0.9926958 -1.0 1.0 0.8481873
1.0 0.69373226 1.0 0.96551263
1.0 -1.0 -1.0 -0.99402606
1.0 1.0 -1.0 -0.8839095
0.523847 1.0 -1.0 0.97791934
0.8617313 -0.24964637 -1.0 0.93508875
-1.0 -1.0 -1.0 -0.45542228
1.0 0.5531106 -1.0 0.9666803
-0.4779033 -1.0 1.0 -0.9399356
1.0 -0.7726854 -1.0 0.049167514
1.0 1.0 1.0 -0.32015216
1.0 0.97300565 1.0 -0.99384534
-1.0 0.32269317 1.0 -0.9622354
rewards 0.1399400693733245
turbulence 21.6299991607666
trade: 2646
cost: 3522.0372934475013
-0.37526578 0.37451664 -1.0 0.96044195
-0.60722136 0.10186381 -1.0 0.94756854
-1.0 0.54938185 1.0 -0.41383898
-1.0 -1.0 -1.0 0.99003386
-1.0 -1.0 1.0 0.8617343
-1.0 -1.0 -1.0 0.9792397
1.0 1.0 1.0 0.8472674
1.0 -0.15516602 1.0 -0.94932926
-1.0 -1.0 1.0 -0.8195121
-1.0 1.0 -1.0 -0.7448844
```

```
1.0 -0.21229625 1.0 0.74527454
-1.0 0.31320944 -1.0 -0.9692164
-1.0 0.7805292 1.0 0.33755958
1.0 -1.0 1.0 -0.9890075
1.0 -0.40027186 1.0 -0.8736062
1.0 -0.10984594 1.0 0.63368964
-0.09974587 0.022682667 1.0 0.9958602
1.0 -0.370239 1.0 0.97889185
1.0 0.11523554 -1.0 -0.99404144
1.0 0.2784653 -1.0 -0.9741012
0.15035996 -1.0 -1.0 0.95422125
-0.20774823 1.0 -1.0 0.980762
-1.0 0.8242645 -1.0 -0.74688506
1.0 -1.0 -1.0 0.98218906
-0.4125845 0.47418842 1.0 -0.69483596
1.0 -0.910718 -1.0 -0.94912595
1.0 -0.76508284 1.0 0.07818937
-0.64046425 -1.0 1.0 -0.9802416
-1.0 -0.19526991 1.0 -0.9069147
rewards -0.5257804428100586
turbulence 21.989999771118164
trade: 2659
cost: 3522.0372934475013
-0.02571106 -0.91177785 -1.0 0.9868648
-1.0 0.031080127 -1.0 0.8465227
-1.0 1.0 1.0 0.23295724
-1.0 -0.24813735 -1.0 0.86555517
1.0 -0.45498145 1.0 0.9458792
-0.63487947 -1.0 -1.0 0.9623716
1.0 0.35376468 1.0 0.9813807
1.0 -0.67349356 1.0 -0.82299864
0.38799512 -0.07116356 1.0 -0.9907011
-1.0 -0.17881492 -1.0 -0.92194855
1.0 0.6550593 1.0 -0.84459513
-1.0 1.0 -1.0 -0.63899964
1.0 1.0 1.0 0.3975253
1.0 1.0 1.0 -0.9550801
1.0 -0.17241046 1.0 -0.9045665
1.0 0.57618165 1.0 0.95295334
0.24066174 0.43714795 1.0 0.98820543
1.0 -0.5806246 1.0 0.93038666
1.0 -0.106067054 -1.0 -0.99528366
1.0 -1.0 -1.0 -0.88238
1.0 -1.0 -1.0 0.98826957
-1.0 0.10032739 -1.0 0.9625046
-1.0 1.0 -1.0 -0.9280504
1.0 0.052752525 -1.0 0.99355507
-0.8557784 1.0 1.0 -0.8469193
```

```
1.0 1.0 -1.0 -0.9475451
1.0 1.0 1.0 -0.42090762
0.8219209 -1.0 1.0 -0.632721
-1.0 -0.8040356 1.0 -0.98615426
rewards 0.528499603112787
turbulence 21.25
trade: 2674
cost: 3528.415461233146
-0.5474223 -1.0 -1.0 0.95461845
-1.0 -0.50612617 -1.0 0.117042065
-0.9551581 -1.0 1.0 0.3557222
-1.0 -1.0 -1.0 0.9394705
-1.0 0.9132077 1.0 0.7911458
-1.0 -0.11731228 -1.0 0.9455917
1.0 0.44062376 1.0 0.98359835
1.0 -0.9495391 1.0 -0.72114336
-0.14991587 1.0 1.0 -0.9663021
-1.0 -0.117231935 -1.0 0.1361674
1.0 1.0 1.0 0.9232739
-1.0 -0.94129163 -1.0 -0.9184366
1.0 1.0 1.0 0.5952865
1.0 -0.122580886 1.0 -0.9936178
1.0 -0.7688505 1.0 -0.9212204
1.0 -0.22677043 1.0 0.9330913
0.040253043 1.0 1.0 0.97096467
1.0 0.75497043 1.0 0.9835944
1.0 -0.2989326 -1.0 -0.9837963
1.0 1.0 -1.0 -0.73913157
1.0 0.048372224 -1.0 0.985538
0.054201186 -0.36208645 -1.0 0.9845431
-1.0 -0.24269538 -1.0 -0.8299868
1.0 -0.7118625 -1.0 0.99497163
-1.0 -1.0 1.0 -0.5798467
1.0 -0.09531145 -1.0 -0.20421046
1.0 0.94575834 1.0 0.8086264
0.684873 1.0 1.0 -0.9801315
-1.0 -0.17166819 1.0 -0.9923207
rewards -0.15676139143067414
turbulence 19.96999931335449
trade: 2688
cost: 3535.8854775295326
-1.0 0.11262742 -1.0 0.65883696
-1.0 1.0 -1.0 0.16459525
-1.0 1.0 1.0 0.16812444
-1.0 0.4038313 -1.0 0.9834366
-1.0 1.0 1.0 0.97001743
-0.2291106 -0.12232363 -1.0 0.6907687
1.0 0.031826496 1.0 0.97789645
```

```
0.52972484 1.0 1.0 0.25910568
0.13807708 0.7684308 1.0 -0.67830515
-1.0 0.62061477 -1.0 -0.90613204
1.0 1.0 1.0 -0.123060465
-1.0 -1.0 -1.0 -0.9219494
0.87593436 1.0 1.0 0.8875184
1.0 0.1818849 1.0 -0.9861755
1.0 -0.23127566 1.0 -0.84217376
1.0 0.86319 1.0 -0.45218086
0.7586274 0.098112404 1.0 0.94686913
1.0 -0.9677663 1.0 0.98077154
1.0 -1.0 -1.0 -0.9974359
1.0 1.0 -1.0 -0.92200977
0.45108065 0.7811733 -1.0 0.9432142
0.7129673 -0.44304422 -1.0 0.9801575
-0.9137386 -0.46227992 -1.0 -0.7370976
1.0 0.37200844 -1.0 0.9938991
-1.0 0.3079009 1.0 -0.9463223
1.0 -0.96972984 -1.0 -0.958759
1.0 0.61691 1.0 0.9797814
-1.0 -0.5439852 1.0 -0.9638514
-1.0 -0.19902138 1.0 -0.9804014
rewards 0.5941068801879883
turbulence 21.459999084472656
trade: 2706
cost: 3535.8854775295326
-0.8289103 -1.0 -1.0 0.91822195
-1.0 0.6225045 -1.0 0.46198213
-1.0 -0.880875 1.0 -0.7636938
-1.0 -0.8492162 -1.0 0.8522394
-0.3293253 1.0 1.0 0.92632854
-1.0 0.7701951 -1.0 0.83607936
1.0 -1.0 1.0 0.9070331
1.0 -1.0 1.0 -0.7583977
-0.21906908 1.0 1.0 -0.98329407
-1.0 -1.0 -1.0 0.5091634
1.0 -1.0 1.0 0.75541806
-1.0 1.0 -1.0 -0.9875549
0.83454186 0.19050771 1.0 0.34547496
1.0 1.0 1.0 -0.9678436
1.0 -0.5649781 1.0 -0.7152863
1.0 0.47305405 1.0 0.67473066
0.37824982 -1.0 1.0 0.9536803
1.0 -0.89803755 1.0 0.87125087
1.0 -1.0 -1.0 -0.9350715
1.0 1.0 -1.0 -0.8339631
-0.01419206 -0.11050219 -1.0 0.9288186
0.5004466 0.4824038 -1.0 0.98528576
```

```
-1.0 0.9232345 -1.0 -0.9059717
1.0 1.0 -1.0 0.9910619
0.76988804 -0.5507472 1.0 -0.9280903
1.0 -0.56444734 -1.0 -0.8964526
1.0 1.0 1.0 0.40494752
0.17701043 1.0 1.0 -0.9503287
-1.0 1.0 1.0 -0.9981957
rewards 0.564338403811655
turbulence 21.5
trade: 2722
cost: 3545.852475484855
-1.0 0.46349308 -1.0 0.9121194
-1.0 1.0 -1.0 0.88561547
0.4566337 1.0 1.0 -0.52373266
-1.0 0.75235295 -1.0 0.9636514
-1.0 1.0 1.0 0.57020783
-1.0 1.0 -1.0 0.8040916
1.0 1.0 1.0 0.9596344
1.0 0.63909966 1.0 -0.6671163
0.5286615 -0.18332648 1.0 -0.98269844
-1.0 -0.33593732 -1.0 0.11569822
1.0 0.50156814 1.0 0.22709537
-1.0 1.0 -1.0 -0.98153394
1.0 1.0 1.0 0.42591798
1.0 -0.94100916 1.0 -0.9825649
1.0 -1.0 1.0 -0.86754316
1.0 -0.31815118 1.0 0.7929063
1.0 0.5842995 1.0 0.9931195
0.41565526 -0.33849904 1.0 0.97383666
1.0 -1.0 -1.0 -0.9606258
1.0 -1.0 -1.0 -0.9198704
1.0 -0.97900075 -1.0 0.99312925
-1.0 -0.9290612 -1.0 0.96027684
-1.0 -1.0 -1.0 -0.9015869
1.0 0.46445742 -1.0 0.98106074
-1.0 0.702092 1.0 -0.9139831
1.0 1.0 -1.0 -0.55647385
0.9155202 -0.43035796 1.0 0.9563205
-0.09467961 0.07613307 1.0 -0.96259373
-0.99930847 -1.0 1.0 -0.9969845
rewards -0.23262620413361584
turbulence 22.489999771118164
trade: 2739
cost: 3553.7378078365396
0.10388601 -1.0 -1.0 0.8706192
-1.0 1.0 -1.0 0.18079114
-1.0 -0.42091742 1.0 -0.74426067
-0.56691027 -0.042295247 -1.0 0.97601414
```

```
0.18659216 -0.6926793 1.0 0.7919328
-1.0 1.0 -1.0 0.89757466
0.79431236 0.77316755 1.0 0.986109
0.70259213 -0.17345585 1.0 -0.93712884
-1.0 1.0 1.0 -0.9377516
-1.0 -0.15556572 -1.0 -0.48051786
1.0 -0.18852633 1.0 -0.052861035
-1.0 -0.98203546 -1.0 -0.9569904
1.0 -0.3229579 1.0 0.3621292
1.0 -0.7250303 1.0 -0.9549007
1.0 -1.0 1.0 -0.86141944
1.0 -1.0 1.0 0.623773
0.47411358 -0.26080146 1.0 0.9157152
1.0 -0.6241745 1.0 0.7611313
1.0 0.16144252 -1.0 -0.9914397
1.0 -0.4042139 -1.0 -0.98297405
-0.7562388 0.19077934 -1.0 0.98710036
-0.97310114 -0.90772617 -1.0 0.9856634
-1.0 1.0 -1.0 -0.97099215
1.0 1.0 -1.0 0.98088837
-1.0 -1.0 1.0 -0.4142838
1.0 -0.81444967 -1.0 -0.6741152
1.0 0.8763317 1.0 0.3227042
-1.0 1.0 1.0 -0.91997117
-1.0 -1.0 1.0 -0.9872938
rewards -0.41666917313232554
turbulence 22.049999237060547
trade: 2752
cost: 3561.3762478389813
-0.8848917 1.0 -1.0 0.9950502
-1.0 0.048369564 -1.0 0.7960737
-1.0 0.3446227 1.0 -0.9749748
-1.0 0.1394383 -1.0 0.9841342
0.19225448 -1.0 1.0 0.39856255
-0.6513145 0.16787863 -1.0 0.6173017
1.0 0.31189042 1.0 0.94926596
1.0 -1.0 1.0 -0.9417988
0.31262878 1.0 1.0 -0.95262074
-1.0 1.0 -1.0 0.045357823
1.0 1.0 1.0 -0.46912575
-1.0 -1.0 -1.0 -0.8055969
1.0 1.0 1.0 0.8207824
1.0 -0.0050697923 1.0 -0.90050596
1.0 0.20329449 1.0 -0.92549545
1.0 0.4476245 1.0 -0.36407393
1.0 0.33768076 1.0 0.9937382
1.0 -1.0 1.0 0.851969
-0.07895434 -0.1645003 -1.0 -0.9788328
```

```
1.0 -0.42491502 -1.0 -0.96426475
-0.5679615 -1.0 -1.0 0.9830978
-0.1891222 -1.0 -1.0 0.81149673
-1.0 -1.0 -1.0 -0.9761274
1.0 0.15083697 -1.0 0.97290266
-1.0 1.0 1.0 -0.9754008
1.0 1.0 -1.0 -0.96531296
1.0 0.6258933 1.0 0.4225533
-1.0 1.0 1.0 -0.8996104
-1.0 0.30204284 1.0 -0.9046407
rewards -0.22968919792822562
turbulence 23.450000762939453
trade: 2770
cost: 3582.047531625755
0.24522722 0.36261827 -1.0 0.8943715
-0.9566159 -1.0 -1.0 -0.11038357
-1.0 -1.0 1.0 -0.7994727
-1.0 1.0 -1.0 0.9734392
-0.9367193 -0.104044735 1.0 0.6125829
0.2183845 1.0 -1.0 0.87107515
0.34912282 0.86979556 1.0 0.9791262
-0.18191564 -1.0 1.0 -0.8682758
1.0 0.40908822 1.0 -0.8832209
-1.0 -1.0 -1.0 0.81190324
1.0 1.0 1.0 -0.17931187
-1.0 1.0 -1.0 -0.9617751
1.0 0.3191632 1.0 0.740962
1.0 -1.0 1.0 -0.98768485
1.0 1.0 1.0 -0.98091424
1.0 -0.19348681 1.0 0.8373196
0.86555684 -0.21101254 1.0 0.9805219
1.0 0.8136343 1.0 0.8240626
1.0 -1.0 -1.0 -0.9766355
1.0 -1.0 -1.0 -0.8618187
1.0 -1.0 -1.0 0.9840113
-0.17137995 1.0 -1.0 0.821056
-1.0 1.0 -1.0 -0.9265042
1.0 -1.0 -1.0 0.977921
-1.0 1.0 1.0 -0.7684891
1.0 1.0 -1.0 -0.9353092
1.0 0.65895283 1.0 0.89092505
-0.16326581 1.0 1.0 -0.97612804
-1.0 -0.9204037 1.0 -0.8908976
rewards 0.43334397621154785
turbulence 23.11000061035156
trade: 2786
cost: 3582.047531625755
-1.0 -1.0 -1.0 0.75682473
```

```
-1.0 1.0 -1.0 0.59357524
-1.0 0.46105736 1.0 -0.24855089
-1.0 -0.32408744 -1.0 0.9904375
-0.91649485 -0.25810733 1.0 0.74257684
-0.90572506 0.37443584 -1.0 0.96921206
1.0 -0.32169354 1.0 0.9842708
0.55066013 -0.94126225 1.0 -0.21731365
-1.0 0.004223138 1.0 -0.9531163
-1.0 -1.0 -1.0 -0.2906438
1.0 0.14539248 1.0 0.43731856
-0.64088345 -1.0 -1.0 -0.98007786
0.61663437 -1.0 1.0 -0.73573446
1.0 1.0 1.0 -0.9621881
1.0 -0.9954547 1.0 -0.9421509
1.0 -0.021132648 1.0 0.95120406
1.0 -1.0 1.0 0.98744035
-1.0 -1.0 1.0 0.9113383
1.0 -0.34298173 -1.0 -0.6002476
1.0 -0.8377311 -1.0 -0.9612536
-0.42365688 -1.0 -1.0 0.9666109
-1.0 1.0 -1.0 0.7096367
-1.0 -0.6672123 -1.0 -0.9784145
1.0 0.17216653 -1.0 0.98865867
-0.828096 -1.0 1.0 -0.8531207
1.0 0.32487673 -1.0 -0.89749324
1.0 -0.17902154 1.0 0.89085555
-0.5527574 -0.030938119 1.0 -0.9449422
-1.0 -0.68265605 1.0 -0.9864487
rewards 0.9647080691852608
turbulence 21.34000015258789
trade: 2800
cost: 3602.242829305656
1.0 0.04480174 -1.0 0.99637675
-1.0 0.5337541 -1.0 0.9724554
-1.0 1.0 1.0 -0.9403248
-1.0 0.7286605 -1.0 0.9726366
0.7420227 0.9545264 1.0 0.95957506
-0.43978882 1.0 -1.0 0.98043895
-0.40517604 0.10941577 1.0 0.89309514
0.96972346 -0.63018227 1.0 0.3423822
-1.0 1.0 1.0 -0.96734077
-1.0 -0.9674819 -1.0 -0.7662219
-0.14084435 -0.9854842 1.0 -0.1123662
-1.0 -0.31037378 -1.0 -0.9503332
1.0 1.0 1.0 0.89594054
1.0 1.0 1.0 -0.8270078
1.0 0.63811034 1.0 -0.9049539
1.0 0.65145636 1.0 0.36732125
```

```
0.8484895 0.418698 1.0 0.9610827
1.0 1.0 1.0 0.96202517
1.0 -0.40515846 -1.0 -0.9727442
1.0 -0.05541356 -1.0 -0.842041
-0.05857411 -1.0 -1.0 0.8976102
-0.2989024 1.0 -1.0 0.9745513
-1.0 -0.7952719 -1.0 -0.71326596
1.0 0.7387628 -1.0 0.9965615
-0.592834 1.0 1.0 -0.79934525
1.0 -1.0 -1.0 -0.80075264
1.0 1.0 1.0 0.9552598
-0.25412595 -1.0 1.0 -0.98805666
-1.0 -1.0 1.0 -0.98327714
rewards -2.003992636040133
turbulence 28.88999938964844
trade: 2817
cost: 3614.1608889255594
-1.0 -0.082172066 -1.0 0.9581845
-1.0 -1.0 -1.0 0.92668545
-1.0 1.0 1.0 -0.59622407
-1.0 -0.7909889 -1.0 0.98753357
0.28835335 1.0 1.0 0.40899527
-1.0 1.0 -1.0 0.7170538
1.0 -1.0 1.0 0.98558486
0.37023938 -1.0 1.0 -0.5986123
-1.0 -0.7494296 1.0 -0.79595006
-1.0 -0.8127273 -1.0 -0.14330614
1.0 -1.0 1.0 0.32367325
-1.0 1.0 -1.0 -0.758975
0.5125567 -1.0 1.0 0.5055244
1.0 -0.69635165 1.0 -0.9393427
1.0 -1.0 1.0 -0.9620707
0.82299256 -0.05157289 1.0 0.52421737
1.0 -1.0 1.0 0.9890758
0.28106153 0.9915256 1.0 0.96856165
-0.16722608 0.10897595 -1.0 -0.94421893
1.0 -0.46387386 -1.0 -0.9373043
-1.0 1.0 -1.0 0.9928125
0.8879632 0.3979603 -1.0 0.96478677
-1.0 -1.0 -1.0 -0.9044466
1.0 1.0 -1.0 0.9832548
-1.0 -0.5474806 1.0 -0.97534984
1.0 0.107970506 -1.0 -0.98078996
1.0 0.90518165 1.0 0.9406805
1.0 0.7259339 1.0 -0.95737284
-1.0 -0.6906841 1.0 -0.9831668
rewards -1.521512272845069
turbulence 27.950000762939453
```

```
trade: 2832
cost: 3616.152098058708
-0.5006583 0.5473194 -1.0 0.8410145
-1.0 1.0 -1.0 0.9573407
-1.0 0.6735531 1.0 -0.6825919
-1.0 0.14742702 -1.0 0.6606319
-0.5731022 1.0 1.0 0.88179135
-1.0 -0.7340642 -1.0 0.93030894
1.0 1.0 1.0 0.7852254
1.0 -1.0 1.0 -0.20403302
-1.0 -0.49575084 1.0 -0.8331395
-1.0 1.0 -1.0 -0.9019512
1.0 -1.0 1.0 0.3755709
-1.0 0.6281681 -1.0 -0.80492187
1.0 0.20857392 1.0 0.9391036
1.0 0.4230028 1.0 -0.99507153
1.0 0.34683236 1.0 -0.6750396
1.0 1.0 1.0 0.27024996
1.0 0.68446004 1.0 0.98690367
1.0 1.0 1.0 0.9548161
1.0 -0.03674343 -1.0 -0.9798161
1.0 1.0 -1.0 -0.98237336
-0.07310723 1.0 -1.0 0.99255216
-0.34420413 0.14705187 -1.0 0.9893626
-1.0 0.11930692 -1.0 -0.9084617
1.0 -0.19052663 -1.0 0.983021
0.46607092 -0.28742477 1.0 -0.96112746
1.0 1.0 -1.0 -0.8995781
1.0 -1.0 1.0 0.5964683
1.0 -1.0 1.0 -0.87268746
-1.0 -0.6718682 1.0 -0.88875026
rewards 3.2696979187671564
turbulence 23.350000381469727
trade: 2850
cost: 3626.2585655994485
0.05495 -0.44132492 -1.0 0.7699168
-1.0 0.51881623 -1.0 0.6692922
-1.0 0.4695496 1.0 -0.90888524
-1.0 -1.0 -1.0 0.9430139
-1.0 1.0 1.0 0.47267795
0.88248956 -0.74951047 -1.0 0.93153715
0.9429911 0.15192005 1.0 0.94499564
1.0 0.3080358 1.0 -0.5052172
0.6381724 -1.0 1.0 -0.96876544
-1.0 -0.80164796 -1.0 -0.73365355
1.0 1.0 1.0 0.3107561
-1.0 -1.0 -1.0 -0.9616651
1.0 1.0 1.0 0.9749596
```

```
1.0 -0.6980332 1.0 -0.9469441
1.0 -1.0 1.0 -0.8148446
1.0 1.0 1.0 0.7942586
1.0 -0.09767561 1.0 0.9268056
1.0 -0.2631088 1.0 0.37614036
1.0 0.5039979 -1.0 -0.94385296
1.0 0.75646704 -1.0 -0.97874683
0.31054035 -0.5265253 -1.0 0.89570737
1.0 0.049766026 -1.0 0.98900795
-1.0 0.52045107 -1.0 -0.47352797
1.0 -0.15437096 -1.0 0.98033214
-0.02515766 1.0 1.0 -0.9755138
1.0 0.56282544 -1.0 -0.9174091
1.0 -1.0 1.0 0.8424059
-1.0 0.95838654 1.0 -0.73827946
-0.6358609 0.41971865 1.0 -0.94958395
rewards -1.2811582122802736
turbulence 24.100000381469727
trade: 2865
cost: 3626.2585655994485
-1.0 -1.0 -1.0 0.90797806
-1.0 0.04212034 -1.0 0.93496394
-1.0 0.3736951 1.0 -0.6896748
-1.0 0.5870311 -1.0 0.97529626
0.7926735 1.0 1.0 0.036645174
-0.39490944 0.59632254 -1.0 0.95974374
1.0 1.0 1.0 0.99582064
1.0 -0.051110685 1.0 0.2222948
0.5748882 1.0 1.0 -0.2829448
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1.0 1.0 1.0 -0.97672945
```

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rewards -0.735908840316767
turbulence 26.670000076293945
trade: 2883
cost: 3633.6616431446146
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rewards -1.3411979606655193
turbulence 28.56999969482422
trade: 2902
cost: 3660.640010023124
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rewards 2.6542321513923817
turbulence 24.65999984741211
trade: 2916
cost: 3672.07816254235
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turbulence 25.46999931335449
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cost: 3676.1508774700237
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rewards 0.24899237594604492
turbulence 24.030000686645508
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rewards 1.273695951696788
turbulence 22.559999465942383
trade: 2964
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turbulence 20.690000534057617
trade: 2998
cost: 3724.1161299572063
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turbulence 20.030000686645508
trade: 3015
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0.85557544 0.19963998 1.0 0.93364537
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turbulence 21.57999992370605
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```

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-1.0 -1.0 1.0 0.87463284
-1.0 0.636472 -1.0 0.97605324
0.22620194 -0.84920585 1.0 0.9710164
-1.0 1.0 -1.0 0.8247278
0.292677 -0.077192485 1.0 0.9364692
1.0 0.43518296 1.0 -0.7856406
-1.0 0.43671244 1.0 -0.53327894
-1.0 0.05154431 -1.0 0.067484856
1.0 1.0 1.0 0.74429107
-1.0 -0.2581828 -1.0 -0.7815973
1.0 1.0 1.0 -0.79288507
1.0 0.6211649 1.0 -0.99637294
1.0 -1.0 1.0 -0.9760658
1.0 0.117146105 1.0 0.62681806
1.0 -1.0 1.0 0.97442436
1.0 0.95698047 1.0 0.96984434
1.0 1.0 -1.0 -0.96837974
1.0 -1.0 -1.0 -0.7168884
-0.078155756 1.0 -1.0 0.9731425
1.0 -0.5063566 -1.0 0.9721681
-1.0 0.06795579 -1.0 -0.5297619
1.0 0.6846224 -1.0 0.9107399
-1.0 0.34697562 1.0 -0.68433833
1.0 -0.34484863 -1.0 -0.35080945
1.0 -0.2057842 1.0 0.6910354
0.5433711 0.7439921 1.0 -0.8362819
-1.0 1.0 1.0 -0.939317
rewards 0.3376051651000977
turbulence 18.8799991607666
```

```
trade: 3096
cost: 3760.4324470501024
-0.40755278 -0.32021287 -1.0 0.9020047
0.31732845 -0.32479316 -1.0 0.6968255
-0.8645953 1.0 1.0 -0.4604019
-1.0 0.8460925 -1.0 0.98200333
-0.6357828 0.50418496 1.0 0.9858663
-1.0 1.0 -1.0 0.93475735
0.64959705 -0.3975492 1.0 0.8890438
1.0 -0.7195904 1.0 -0.90713406
-0.8134737 0.95893323 1.0 -0.8029214
-1.0 0.1699921 -1.0 -0.012029588
1.0 0.95803493 1.0 -0.7857261
-1.0 0.4821227 -1.0 -0.94541156
-0.27304316 1.0 1.0 0.83686304
1.0 0.89649165 1.0 -0.9705581
1.0 -0.61461914 1.0 -0.995909
1.0 1.0 1.0 0.9168055
1.0 -1.0 1.0 0.91488826
1.0 1.0 1.0 0.93018436
1.0 -0.61576426 -1.0 -0.88762283
1.0 1.0 -1.0 -0.7603299
-0.19505215 -1.0 -1.0 0.842088
-0.82910544 -0.36610126 -1.0 0.99074876
-1.0 -1.0 -1.0 -0.91524005
1.0 -1.0 -1.0 0.9916184
-1.0 -0.7575757 1.0 -0.699211
1.0 -0.28934288 -1.0 -0.8644631
1.0 -1.0 1.0 -0.12309897
-0.74755275 -0.11281738 1.0 -0.87489814
-1.0 1.0 1.0 -0.9047556
rewards -0.9456824481292861
turbulence 20.299999237060547
trade: 3112
cost: 3780.7746247234422
-1.0 0.64080656 -1.0 0.94087446
-1.0 -1.0 -1.0 0.84972537
-0.66102076 -1.0 1.0 -0.6833415
-1.0 1.0 -1.0 0.9481702
0.3972562 -1.0 1.0 0.94393647
-1.0 0.786204 -1.0 0.9315381
0.23043936 -0.39269453 1.0 0.9941933
0.97058344 -0.55005383 1.0 -0.66086
-1.0 -0.15145677 1.0 -0.9079631
-1.0 1.0 -1.0 -0.28993708
1.0 -0.12778357 1.0 -0.02249372
-1.0 1.0 -1.0 -0.9899568
1.0 1.0 1.0 0.16720974
```

```
1.0 1.0 1.0 -0.9934107
1.0 -1.0 1.0 -0.88936186
1.0 -1.0 1.0 0.7665938
-1.0 -0.057842314 1.0 0.98513436
1.0 -1.0 1.0 0.90207314
1.0 0.04824986 -1.0 -0.9768247
1.0 1.0 -1.0 -0.9608264
0.16529374 1.0 -1.0 0.94531095
0.8093116 -0.35907054 -1.0 0.92348146
-1.0 -0.026603758 -1.0 -0.9264932
1.0 1.0 -1.0 0.9865172
-1.0 1.0 1.0 -0.75939673
1.0 0.6120975 -1.0 -0.97870016
1.0 0.5039244 1.0 0.9476433
0.6610464 -1.0 1.0 -0.9411034
-1.0 0.23451847 1.0 -0.8037516
rewards 0.17348888473510743
turbulence 21.200000762939453
trade: 3126
cost: 3780.7746247234422
-1.0 -1.0 -1.0 0.67984104
-1.0 1.0 -1.0 0.9127517
-0.27925718 0.89170665 1.0 -0.98672616
-1.0 -0.78020483 -1.0 0.987108
-0.15879111 -0.5741138 1.0 0.6649624
0.55486405 1.0 -1.0 0.58871853
-0.006637335 1.0 1.0 0.9770975
1.0 1.0 1.0 -0.5238407
-0.8075714 -1.0 1.0 -0.8940684
-1.0 0.24840832 -1.0 -0.25699228
1.0 1.0 1.0 0.4915892
-1.0 -0.9347743 -1.0 -0.88313186
1.0 -0.8875011 1.0 0.72939277
1.0 0.2958048 1.0 -0.99383324
1.0 1.0 1.0 -0.7746698
1.0 -0.80818474 1.0 0.9807329
0.48657703 0.66000944 1.0 0.98401797
1.0 -0.09183352 1.0 0.53029394
1.0 -1.0 -1.0 -0.8362459
1.0 -0.16526048 -1.0 -0.9553345
0.7107057 -0.3883263 -1.0 0.99682784
-0.9143212 -1.0 -1.0 0.97484577
-1.0 0.02377832 -1.0 -0.91578996
1.0 -1.0 -1.0 0.98726296
-0.15319341 1.0 1.0 -0.9784298
1.0 -1.0 -1.0 -0.43394464
1.0 1.0 1.0 0.58466053
-0.49843603 1.0 1.0 -0.9612543
```

```
-1.0 0.5317687 1.0 -0.9961034
rewards 0.6817393013091991
turbulence 19.809999465942383
trade: 3143
cost: 3795.382641599663
-0.49616838 0.057498544 -1.0 0.99663687
-1.0 0.96625566 -1.0 0.86445284
-1.0 1.0 1.0 -0.295999
-1.0 -1.0 -1.0 0.99203885
0.18495785 1.0 1.0 0.9609878
-0.51806325 0.3001557 -1.0 0.87002385
1.0 0.045613647 1.0 0.96357036
0.65427095 1.0 1.0 -0.8660517
-0.86109793 -1.0 1.0 -0.9286253
-1.0 0.43779916 -1.0 -0.34804153
1.0 -0.6237399 1.0 0.09554672
-1.0 -1.0 -1.0 -0.97353643
1.0 0.10108761 1.0 0.9846835
1.0 0.15823641 1.0 -0.9806046
1.0 1.0 1.0 -0.9664368
1.0 -1.0 1.0 0.81755006
-0.6781696 -0.8284657 1.0 0.96647584
-0.3427217 1.0 1.0 0.99238443
-0.04886079 1.0 -1.0 -0.9881426
1.0 -0.1968209 -1.0 -0.5787205
-1.0 -1.0 -1.0 0.93589115
-0.007937141 -0.36866307 -1.0 0.9878026
-1.0 -1.0 -1.0 -0.9745114
1.0 -1.0 -1.0 0.99211717
0.9173395 1.0 1.0 -0.9707441
1.0 1.0 -1.0 -0.87558043
1.0 -0.5605418 1.0 0.43874395
1.0 0.605149 1.0 -0.9158352
-1.0 -1.0 1.0 -0.43672305
rewards 2.157022228440107
turbulence 18.86000061035156
trade: 3162
cost: 3811.7831637477952
-0.33139145 1.0 -1.0 0.9364306
-1.0 -1.0 -1.0 0.8358345
-1.0 1.0 1.0 -0.91112715
-1.0 1.0 -1.0 0.99175894
1.0 -0.39676613 1.0 0.63627887
-1.0 -0.9451184 -1.0 0.17303395
1.0 0.39364254 1.0 0.95055723
1.0 -1.0 1.0 -0.746071
0.8597617 -0.9598772 1.0 -0.12349063
-1.0 -1.0 -1.0 -0.15864813
```

```
1.0 -0.7593214 1.0 0.15743637
-1.0 -0.3412854 -1.0 -0.9940643
1.0 0.34041262 1.0 0.63668585
1.0 -0.1324755 1.0 -0.9638255
1.0 -1.0 1.0 -0.967693
1.0 1.0 1.0 0.30139756
1.0 -1.0 1.0 0.99120355
1.0 -1.0 1.0 0.97828794
1.0 0.22592407 -1.0 -0.8672236
1.0 1.0 -1.0 -0.91586274
0.16963488 1.0 -1.0 0.8565252
-1.0 -0.7987946 -1.0 0.9284731
-1.0 0.72463334 -1.0 -0.8642289
1.0 -0.34566498 -1.0 0.97016335
-1.0 0.8693542 1.0 -0.8086772
1.0 -0.37728822 -1.0 -0.8522363
1.0 1.0 1.0 0.8194008
1.0 1.0 1.0 -0.9948848
-1.0 0.8094901 1.0 -0.95822597
rewards 0.04362644108466338
turbulence 20.739999771118164
trade: 3176
cost: 3818.264144746788
-1.0 -1.0 -1.0 0.96131015
-1.0 -1.0 -1.0 0.68218756
-1.0 1.0 1.0 -0.7346126
-1.0 0.18919466 -1.0 0.9907539
1.0 1.0 1.0 0.5284059
-0.35282302 0.95279986 -1.0 0.9168813
0.49102497 -0.44395313 1.0 0.9032304
1.0 0.05455938 1.0 -0.94249725
0.84107745 -1.0 1.0 -0.8053431
-1.0 0.23656368 -1.0 -0.060497522
1.0 -0.5890918 1.0 0.86594725
-1.0 -1.0 -1.0 -0.74345195
-1.0 -0.8061702 1.0 -0.53000677
1.0 0.9552177 1.0 -0.9579317
1.0 -1.0 1.0 -0.9211056
1.0 0.84576684 1.0 0.9039302
-0.9409406 -0.50439996 1.0 0.9925058
1.0 0.47192177 1.0 0.7722876
1.0 -0.83501464 -1.0 -0.81583774
1.0 1.0 -1.0 -0.9937812
-0.46290523 0.017726928 -1.0 0.99289083
0.22122702 -1.0 -1.0 0.9798176
-1.0 -0.8909545 -1.0 -0.98007673
1.0 -1.0 -1.0 0.93198717
-1.0 -1.0 1.0 -0.7813857
```

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1.0 0.17375538 -1.0 -0.9589105
1.0 0.9730891 1.0 0.7042055
0.14686705 0.006518692 1.0 -0.98999035
-1.0 0.6369557 1.0 -0.9920035
rewards -0.2578594080692157
turbulence 19.61000061035156
trade: 3192
cost: 3825.4278093319017
-1.0 -0.8781729 -1.0 0.69960165
-1.0 -1.0 -1.0 0.9667318
-1.0 -1.0 1.0 -0.9064931
-0.33828318 -0.02997443 -1.0 0.93804574
-0.45895123 -0.1344226 1.0 0.66629016
-1.0 -1.0 -1.0 0.9355284
1.0 -1.0 1.0 0.861766
1.0 -0.26032045 1.0 -0.80094165
0.87088567 0.44647306 1.0 -0.9755223
-1.0 -0.68204194 -1.0 0.16958296
1.0 0.3303598 1.0 0.08214021
-1.0 1.0 -1.0 -0.8441986
1.0 0.54386735 1.0 0.62125754
1.0 -0.37709036 1.0 -0.9864559
1.0 0.6192063 1.0 -0.9838133
1.0 -0.105982095 1.0 0.83166134
1.0 0.77988166 1.0 0.98949337
0.21002293 -0.15259166 1.0 0.9418895
0.7519824 -0.39663306 -1.0 -0.95690966
1.0 1.0 -1.0 -0.8105404
0.060202852 -1.0 -1.0 0.94761276
-0.39207402 -1.0 -1.0 0.9955838
-1.0 -0.750171 -1.0 -0.79361033
1.0 -1.0 -1.0 0.9728466
-0.24301061 1.0 1.0 -0.9195486
1.0 0.23683158 -1.0 -0.8324695
1.0 1.0 1.0 0.4828844
-0.64497435 -0.65240943 1.0 -0.94942117
-1.0 1.0 1.0 -0.97412634
rewards -0.953716447384283
turbulence 19.399999618530277
trade: 3208
cost: 3841.4573191852646
0.2770443 -0.28807884 -1.0 0.99022186
-1.0 -1.0 -1.0 0.14704347
-1.0 -0.1480819 1.0 -0.44746298
-1.0 -1.0 -1.0 0.96270514
1.0 -0.05867943 1.0 0.8700447
-0.98800135 0.098213255 -1.0 0.6758441
1.0 -1.0 1.0 0.9484154
```

```
1.0 1.0 1.0 -0.43410742
1.0 -1.0 1.0 -0.80736244
-1.0 -0.34175164 -1.0 -0.5127262
1.0 1.0 1.0 -0.076075375
-1.0 0.15917717 -1.0 -0.9032006
1.0 -0.82393426 1.0 -0.84503394
1.0 0.057903916 1.0 -0.95781195
1.0 -0.2846504 1.0 -0.79410255
1.0 1.0 1.0 0.9789529
-0.30844462 -1.0 1.0 0.9766569
-0.5654793 0.8041028 1.0 0.8401871
1.0 0.17475778 -1.0 -0.97999233
1.0 1.0 -1.0 -0.5288954
-1.0 0.5201628 -1.0 0.99642193
1.0 1.0 -1.0 0.9808562
-1.0 0.95792156 -1.0 -0.8346205
1.0 0.7682452 -1.0 0.98094654
-0.61781967 0.5511192 1.0 -0.9725809
1.0 1.0 -1.0 -0.885071
1.0 0.99246967 1.0 0.6261995
1.0 0.7030852 1.0 -0.96555394
-1.0 -0.7186175 1.0 -0.9788824
rewards 0.9240789734779392
turbulence 17.329999923706055
trade: 3224
cost: 3845.5413331852033
-1.0 -0.16453376 -1.0 0.937544
-1.0 -0.090265185 -1.0 0.57548344
-1.0 0.21506196 1.0 -0.98554665
-1.0 0.33797592 -1.0 0.97357714
-0.23014376 0.8402646 1.0 0.923445
-1.0 -0.4015647 -1.0 0.9529035
0.82256806 -0.52167493 1.0 0.9827646
0.7449048 0.7332449 1.0 -0.9179551
-0.2378456 1.0 1.0 -0.82621825
-1.0 -0.7310628 -1.0 -0.7917509
1.0 0.5243433 1.0 -0.9048799
-1.0 0.88324547 -1.0 -0.9929323
1.0 -0.34634054 1.0 0.3079238
1.0 1.0 1.0 -0.9859171
1.0 0.019345388 1.0 -0.9338594
1.0 -0.00086548924 1.0 0.516765
1.0 0.5861205 1.0 0.98482203
0.030341506 1.0 1.0 0.8853004
1.0 0.24336222 -1.0 -0.93977153
1.0 0.46004742 -1.0 -0.9677598
0.042952582 -0.33616006 -1.0 0.9833641
0.4173349 1.0 -1.0 0.96678865
```

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-1.0 -0.52377164 -1.0 -0.82391346
1.0 -0.25070423 -1.0 0.9888811
-1.0 -0.07953 1.0 -0.7036658
1.0 -1.0 -1.0 -0.8904298
1.0 0.22499645 1.0 0.9798558
-0.17058353 1.0 1.0 -0.97752637
-1.0 0.56614304 1.0 -0.9578316
rewards 1.8497876115638763
turbulence 17.90999984741211
trade: 3240
cost: 3847.9603797473983
-1.0 -0.2351415 -1.0 0.9095994
-1.0 -0.13164316 -1.0 0.9256445
-1.0 0.10511397 1.0 -0.71626806
0.03636694 -0.37617213 -1.0 0.9651611
-1.0 -1.0 1.0 0.9018153
-1.0 1.0 -1.0 0.7877152
1.0 -0.17507085 1.0 0.98458517
1.0 1.0 1.0 0.35222065
1.0 -0.64828193 1.0 -0.94734454
-1.0 1.0 -1.0 -0.0049306154
1.0 -1.0 1.0 0.093921304
-1.0 0.75242066 -1.0 -0.85544467
1.0 -0.79695696 1.0 -0.8663648
1.0 -0.0427247 1.0 -0.9755155
1.0 -0.09417896 1.0 -0.9068504
1.0 -0.3112434 1.0 0.8974581
-0.45759094 0.675798 1.0 0.9186938
0.4477911 1.0 1.0 0.92365766
1.0 0.81649315 -1.0 -0.8941386
1.0 -0.78327036 -1.0 -0.96622646
0.65398455 -1.0 -1.0 0.8954121
-0.015194789 -0.07076959 -1.0 0.9680731
-1.0 0.48364097 -1.0 -0.9604133
1.0 1.0 -1.0 0.98983216
-1.0 -1.0 1.0 -0.88699436
1.0 0.017294714 -1.0 -0.73947597
1.0 0.32431522 1.0 -0.21170545
0.518378 -0.68155104 1.0 -0.9936547
-1.0 -0.7766613 1.0 -0.9978361
rewards -0.21836755232887808
turbulence 18.1200008392334
trade: 3255
cost: 3852.340775167473
0.1198051 -0.0499551 -1.0 0.89284444
-1.0 1.0 -1.0 0.8954989
-0.62998736 -0.6591541 1.0 0.86326456
-1.0 -0.5417123 -1.0 0.90042233
```

```
-0.44604692 -1.0 1.0 0.9569824
-0.4666316 1.0 -1.0 0.99509716
-0.9711299 -0.7936863 1.0 0.99110985
1.0 0.21791634 1.0 -0.93379515
-0.6789844 -0.4299095 1.0 -0.95993423
-1.0 -1.0 -1.0 -0.3389814
1.0 -1.0 1.0 -0.8069511
-1.0 -0.9489287 -1.0 -0.7758022
1.0 -0.38994586 1.0 0.5406518
1.0 1.0 1.0 -0.88423085
1.0 1.0 1.0 -0.9547133
1.0 1.0 1.0 0.9612824
0.5778772 0.72382087 1.0 0.99186194
1.0 -0.5063968 1.0 0.89697015
1.0 -1.0 -1.0 -0.9947835
1.0 0.022904018 -1.0 -0.9637421
0.92989546 0.41504622 -1.0 0.9859735
-1.0 0.40843368 -1.0 0.97994554
-0.6160884 -1.0 -1.0 -0.9399693
1.0 0.08654107 -1.0 0.9605731
0.32399637 -0.39301592 1.0 -0.89195675
0.30314755 1.0 -1.0 -0.8049486
1.0 -1.0 1.0 0.7600957
0.46103346 -0.6266691 1.0 -0.9669979
-1.0 -0.46801066 1.0 -0.9947247
rewards 0.46854099806137384
turbulence 17.15999984741211
trade: 3273
cost: 3856.4205749797898
-0.19870949 0.2982495 -1.0 0.9386128
-1.0 -1.0 -1.0 0.80665886
-1.0 0.51197314 1.0 -0.9299186
-1.0 -0.46205163 -1.0 0.9575846
0.33543783 0.44157624 1.0 0.94683933
-1.0 1.0 -1.0 0.8394959
1.0 -0.9141164 1.0 0.90241647
1.0 -0.050299853 1.0 -0.07334685
-1.0 -0.3297821 1.0 -0.97749007
-1.0 0.8451427 -1.0 -0.79969466
1.0 0.71576923 1.0 -0.4915533
-1.0 0.80319387 -1.0 -0.95268476
1.0 1.0 1.0 0.8659253
1.0 0.24625584 1.0 -0.9910928
1.0 -0.31204492 1.0 -0.9695591
1.0 1.0 1.0 0.8146974
1.0 -1.0 1.0 0.99741054
0.26475084 1.0 1.0 0.9711112
0.42704296 0.60602665 -1.0 -0.95757216
```

```
1.0 1.0 -1.0 -0.92338496
0.17353049 0.72855735 -1.0 0.94447064
-0.63218 0.12510863 -1.0 0.9632951
-1.0 -0.2739808 -1.0 -0.9159356
1.0 1.0 -1.0 0.9674754
-1.0 0.7387792 1.0 -0.84027064
1.0 -0.78144157 -1.0 -0.6766833
1.0 0.3505676 1.0 0.9553021
-0.0007057227 0.12712981 1.0 -0.96044487
-1.0 -0.5814386 1.0 -0.99632776
rewards -0.5577037729369942
turbulence 16.950000762939453
trade: 3288
cost: 3856.648329679497
-0.64950013 -0.3051004 -1.0 0.78442216
-1.0 1.0 -1.0 0.80226326
-1.0 -0.48816204 1.0 -0.8590799
-1.0 1.0 -1.0 0.9954257
-0.21228257 1.0 1.0 0.87494373
-0.9995174 0.70886004 -1.0 0.97963643
0.3553459 1.0 1.0 0.8684876
0.34918165 -0.05094707 1.0 0.25927305
-0.188782 -0.30997664 1.0 -0.8457616
-1.0 1.0 -1.0 -0.36515534
1.0 1.0 1.0 -0.0023988485
-1.0 1.0 -1.0 -0.8689437
-0.61763096 1.0 1.0 0.06931496
1.0 0.93377507 1.0 -0.9696524
1.0 0.62884235 1.0 -0.9861156
1.0 0.4205044 1.0 0.82966423
1.0 1.0 1.0 0.985978
0.98871446 1.0 1.0 0.8224343
0.9241751 -0.88028216 -1.0 -0.9959033
1.0 -0.8335713 -1.0 -0.9164136
0.123468086 -0.26996946 -1.0 0.98267436
0.550071 1.0 -1.0 0.92944753
-1.0 -1.0 -1.0 -0.8903581
1.0 -1.0 -1.0 0.9932413
-0.31939605 -1.0 1.0 -0.57219267
1.0 -1.0 -1.0 -0.9610719
1.0 -0.8209164 1.0 0.552654
0.559923 1.0 1.0 -0.9684647
-1.0 -0.41451207 1.0 -0.9936305
rewards 1.0951888813537547
turbulence 16.690000534057617
trade: 3307
cost: 3859.719526670464
0.0138885975 -0.56482 -1.0 0.8496704
```

```
-1.0 -0.096971706 -1.0 0.3548708
-1.0 1.0 1.0 -0.95315796
-0.60243714 0.042806387 -1.0 0.9811964
0.111608 -0.5345487 1.0 0.9887459
-0.53204465 0.7688793 -1.0 0.5986552
-0.370664 0.39425385 1.0 0.9777863
1.0 1.0 1.0 -0.8469238
0.6565602 -0.8862527 1.0 -0.8141544
-1.0 -0.5571393 -1.0 -0.70504165
1.0 0.35192233 1.0 -0.722995
-1.0 0.4362564 -1.0 -0.7810607
-0.1756624 -0.4492198 1.0 0.29523706
1.0 0.49382037 1.0 -0.9792822
1.0 0.9152682 1.0 -0.9638041
1.0 -0.33376908 1.0 0.78398573
0.4353071 0.2911362 1.0 0.95462835
1.0 0.37512398 1.0 0.98499465
1.0 1.0 -1.0 -0.99712247
1.0 -0.6099795 -1.0 -0.93693423
-0.54869306 -1.0 -1.0 0.92673373
0.39533436 -1.0 -1.0 0.5839933
-1.0 -1.0 -1.0 -0.9224281
1.0 1.0 -1.0 0.9978337
0.7747814 -0.06967622 1.0 -0.7659273
1.0 1.0 -1.0 -0.9162943
1.0 0.7575615 1.0 0.5563412
0.9618636 -1.0 1.0 -0.9338267
-1.0 0.18139833 1.0 -0.97843
rewards 0.08445468595160638
turbulence 16.90999984741211
trade: 3324
cost: 3873.7216898288807
-1.0 -1.0 -1.0 0.9729849
-1.0 0.98248464 -1.0 0.9254682
-0.20034242 0.77593493 1.0 -0.96742755
-1.0 0.11740124 -1.0 0.9861047
-0.43016443 1.0 1.0 0.9532454
-0.34717202 1.0 -1.0 0.71964
0.40446633 0.73471403 1.0 0.9769919
-0.8794155 -0.67274237 1.0 -0.4121492
-0.30080912 -1.0 1.0 -0.97045135
-1.0 -0.029527575 -1.0 -0.7790775
1.0 -1.0 1.0 0.4175284
-1.0 0.6649833 -1.0 -0.9743781
1.0 -1.0 1.0 0.21036053
1.0 1.0 1.0 -0.938786
1.0 -1.0 1.0 -0.9843778
0.4870062 -1.0 1.0 0.69050384
```

```
-0.12351382 -0.24796888 1.0 0.97339535
-1.0 -0.7337707 1.0 0.97868085
1.0 1.0 -1.0 -0.6981921
1.0 1.0 -1.0 -0.82771885
-1.0 -1.0 -1.0 0.97464085
-0.7046948 1.0 -1.0 0.9736606
-1.0 1.0 -1.0 -0.9071903
1.0 1.0 -1.0 0.9911605
0.5792852 -0.4428565 1.0 -0.92692584
1.0 -0.64867055 -1.0 -0.88345397
1.0 0.08850755 1.0 -0.030907214
1.0 1.0 1.0 -0.95044553
-1.0 -1.0 1.0 -0.9936
rewards -0.1359077343971236
turbulence 16.649999618530273
trade: 3341
cost: 3896.438560167321
0.7712753 -1.0 -1.0 0.93719447
-1.0 0.13795416 -1.0 0.7070054
-1.0 -1.0 1.0 -0.079007685
-1.0 0.41996455 -1.0 0.9833758
0.43380222 -0.4506919 1.0 0.9706793
0.14249122 -0.21897385 -1.0 0.9461596
0.1632964 0.8658411 1.0 0.9246557
1.0 -0.80108184 1.0 -0.74234974
-1.0 -0.82953244 1.0 -0.9544614
-1.0 -1.0 -1.0 -0.5297445
1.0 1.0 1.0 -0.51995695
-1.0 1.0 -1.0 -0.97820634
-0.7476082 0.51857495 1.0 0.7642405
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1.0 -1.0 1.0 -0.98957056
1.0 0.19835833 1.0 0.9023423
1.0 1.0 1.0 0.9929061
1.0 -0.9956559 1.0 0.39344835
0.7414084 -1.0 -1.0 -0.9440118
1.0 -0.4656619 -1.0 -0.94198054
1.0 1.0 -1.0 0.97882867
1.0 0.7599586 -1.0 0.48086023
-1.0 -0.014208466 -1.0 -0.7819514
1.0 -0.20992011 -1.0 0.99630606
-1.0 1.0 1.0 -0.9233991
1.0 -0.7492312 -1.0 -0.5749604
1.0 1.0 1.0 0.7709192
-0.97180235 1.0 1.0 -0.9750861
-1.0 -0.700689 1.0 -0.980078
rewards 0.5360948448181153
turbulence 16.989999771118164
```

```
trade: 3357
cost: 3896.438560167321
0.48447287 1.0 -1.0 0.99506545
-1.0 1.0 -1.0 0.7921648
-1.0 0.8390926 1.0 -0.025334895
-1.0 1.0 -1.0 0.9740555
-0.4164647 0.07404463 1.0 0.9637675
-1.0 1.0 -1.0 0.98033345
1.0 -1.0 1.0 0.9341606
1.0 0.09854618 1.0 -0.041302502
-0.9856923 1.0 1.0 -0.9666694
-1.0 0.27703148 -1.0 -0.63802403
1.0 -1.0 1.0 -0.08977252
-1.0 0.43163377 -1.0 -0.95832515
0.49625933 0.8322248 1.0 0.28539407
1.0 -1.0 1.0 -0.9492184
1.0 0.27196848 1.0 -0.9956441
1.0 1.0 1.0 0.69756436
-0.656837 -1.0 1.0 0.96378267
1.0 -1.0 1.0 0.9686351
1.0 0.5484114 -1.0 -0.9838561
1.0 0.63640296 -1.0 -0.17740792
-0.40300345 -0.6836523 -1.0 0.9829495
-1.0 1.0 -1.0 0.9032817
-1.0 0.40178505 -1.0 -0.904949
1.0 1.0 -1.0 0.9987979
-0.294182 1.0 1.0 -0.67932487
1.0 -0.53894466 -1.0 -0.5856997
1.0 1.0 1.0 0.95158505
-0.28479898 0.9968591 1.0 -0.8955724
-1.0 0.13208851 1.0 -0.97663116
rewards 0.39858825606079773
turbulence 16.56999969482422
trade: 3373
cost: 3906.4547002735226
-1.0 0.75345224 -1.0 0.98893607
-1.0 0.94902647 -1.0 0.32655084
-1.0 -1.0 1.0 -0.20064712
-1.0 -1.0 -1.0 0.96606755
-1.0 0.14218771 1.0 0.9511759
-1.0 0.2738756 -1.0 0.95018816
0.9129808 0.8699168 1.0 0.95784414
0.33174646 -0.63156927 1.0 -0.026564777
1.0 -0.38587895 1.0 -0.80523384
-1.0 -1.0 -1.0 -0.7857926
1.0 0.49076402 1.0 -0.4191482
-1.0 -0.16649438 -1.0 -0.8232319
1.0 -1.0 1.0 0.89200306
```

```
1.0 -0.56529033 1.0 -0.9682197
1.0 -0.9925507 1.0 -0.9814409
1.0 0.53805697 1.0 0.8878753
1.0 -0.7884339 1.0 0.9757104
1.0 -1.0 1.0 0.90864897
0.52298594 0.35561067 -1.0 -0.97101
1.0 0.065780096 -1.0 -0.9707207
0.5426907 0.5021229 -1.0 0.8797225
1.0 -0.1894411 -1.0 0.9731195
-1.0 -0.7483034 -1.0 -0.78011847
0.65958357 0.5995658 -1.0 0.9419551
-1.0 -1.0 1.0 -0.807352
1.0 0.8994124 -1.0 -0.85850185
1.0 0.17721306 1.0 0.78033125
0.5955355 -0.18228185 1.0 -0.8502673
-1.0 -0.42998543 1.0 -0.9944186
rewards 0.992034574766527
turbulence 16.25
trade: 3388
cost: 3921.5066424274532
0.56054676 1.0 -1.0 0.96716285
-1.0 1.0 -1.0 0.9635242
-1.0 1.0 1.0 -0.91170245
-1.0 0.18572721 -1.0 0.97972536
-0.34098533 1.0 1.0 0.67283857
-1.0 0.54083747 -1.0 0.923949
1.0 1.0 1.0 0.974138
0.46035516 -0.4642367 1.0 -0.9582531
-1.0 1.0 1.0 -0.7601982
-1.0 -1.0 -1.0 -0.05075258
1.0 0.700278 1.0 0.44415832
-1.0 0.34895825 -1.0 -0.98511505
1.0 0.6696425 1.0 0.7999835
1.0 -0.4320929 1.0 -0.8724305
1.0 -1.0 1.0 -0.99430317
1.0 0.11402072 1.0 0.73928213
1.0 -0.6335273 1.0 0.9685967
0.99306476 -1.0 1.0 0.9559002
0.011318445 1.0 -1.0 -0.9346742
1.0 -0.36536238 -1.0 -0.9409383
0.164021 -1.0 -1.0 0.99196815
0.21434039 0.24469823 -1.0 0.92090154
-1.0 0.06027335 -1.0 -0.95296156
1.0 0.7250213 -1.0 0.8931099
0.5922869 1.0 1.0 -0.9523318
1.0 -0.18245545 -1.0 -0.9335735
1.0 -1.0 1.0 0.8193116
0.03260819 1.0 1.0 -0.96503824
```

```
-0.86488676 -0.16023244 1.0 -0.94060385
rewards -0.9987053817749024
turbulence 17.290000915527344
trade: 3405
cost: 3921.5066424274532
-1.0 -0.22968413 -1.0 0.9896326
-1.0 1.0 -1.0 0.83841896
-1.0 1.0 1.0 -0.6722594
-1.0 1.0 -1.0 0.98111534
-0.6069247 -0.56149536 1.0 0.48436415
-1.0 -0.10377079 -1.0 0.90308785
-0.2950318 -0.3327667 1.0 0.9281218
-0.48495007 1.0 1.0 -0.79002255
-0.4402066 0.33036667 1.0 -0.9822904
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1.0 1.0 1.0 0.7317834
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1.0 -0.17428744 1.0 0.9632213
1.0 -0.75946367 1.0 -0.8714981
1.0 -1.0 1.0 -0.8890987
1.0 -0.83612204 1.0 0.8953562
-0.4349283 1.0 1.0 0.98253846
1.0 0.18298922 1.0 0.9119046
1.0 0.897429 -1.0 -0.88370705
1.0 1.0 -1.0 -0.81601053
1.0 -1.0 -1.0 0.99632263
0.46171975 0.66389394 -1.0 0.9824599
-1.0 0.29252112 -1.0 -0.7067014
1.0 0.4931271 -1.0 0.99858904
-0.670445 1.0 1.0 -0.9864354
1.0 -1.0 -1.0 -0.96206087
0.52875924 0.25803927 1.0 0.45510066
-0.4535603 1.0 1.0 -0.95739925
-1.0 0.14674383 1.0 -0.9517782
rewards -1.0472699059227015
turbulence 18.68000030517578
trade: 3420
cost: 3928.817331140527
-0.14153582 0.7547366 -1.0 0.92106473
-1.0 -0.17756249 -1.0 0.78308654
-0.7860787 0.94155157 1.0 -0.83737326
-1.0 1.0 -1.0 0.9584327
-0.567976 1.0 1.0 0.28230143
-0.8289337 -1.0 -1.0 0.9039099
1.0 1.0 1.0 0.9649391
1.0 1.0 1.0 -0.40650886
-0.13824081 -1.0 1.0 -0.72014356
-1.0 0.47511256 -1.0 0.43344617
```

```
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1.0 0.04748115 1.0 -0.90886235
1.0 1.0 1.0 0.84084964
0.34027874 0.3575453 1.0 0.9576745
0.5693894 0.13677543 1.0 0.79056525
1.0 -1.0 -1.0 -0.9478456
1.0 0.5696769 -1.0 -0.95746833
-1.0 -0.2602375 -1.0 0.98449004
-0.0033006668 1.0 -1.0 0.9809669
-1.0 -0.43466341 -1.0 -0.9456055
1.0 1.0 -1.0 0.9704337
-0.3787439 0.7580205 1.0 -0.8206379
1.0 -0.112971686 -1.0 -0.39210212
1.0 0.2031896 1.0 0.53645325
0.335794 0.44336048 1.0 -0.990572
-0.40257895 -0.57419527 1.0 -0.7806799
rewards 1.6060793271995617
turbulence 17.5
trade: 3437
cost: 3944.9110372943965
-0.34614182 -0.84022176 -1.0 0.9608102
-1.0 -0.95065653 -1.0 0.18088055
-1.0 0.2592625 1.0 -0.8907941
-1.0 0.9486916 -1.0 0.9388685
-0.35576448 -0.45876104 1.0 0.8101194
-1.0 -0.73684597 -1.0 0.3297875
1.0 0.6684095 1.0 0.9777093
0.52437645 1.0 1.0 0.22403169
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-1.0 0.35068756 -1.0 -0.53430694
1.0 -0.20776683 1.0 0.870564
-1.0 -0.338064 -1.0 -0.9878563
1.0 0.433267 1.0 -0.395383
1.0 -0.22498417 1.0 -0.9925149
1.0 -1.0 1.0 -0.98323816
0.6091459 0.18444732 1.0 0.93556595
0.94594586 -0.42537555 1.0 0.99900675
1.0 -1.0 1.0 0.98933625
0.9568137 -1.0 -1.0 -0.894175
1.0 1.0 -1.0 -0.94191873
1.0 1.0 -1.0 0.9526222
-1.0 0.827806 -1.0 0.9916105
-1.0 -0.52269435 -1.0 -0.9201294
1.0 1.0 -1.0 0.9897773
-0.7885604 0.009688929 1.0 -0.95193326
```

```
1.0 0.60162264 -1.0 -0.2121883
1.0 0.6049131 1.0 0.51528096
0.52800095 -1.0 1.0 -0.9779006
-0.63805926 1.0 1.0 -0.9658931
rewards -1.4671500399291981
turbulence 18.709999084472656
trade: 3451
cost: 3951.2101006794064
-0.6239737 -0.22279388 -1.0 0.99161327
-1.0 -1.0 -1.0 0.9379808
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-1.0 -1.0 -1.0 0.9718461
1.0 0.5073906 1.0 0.9411832
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1.0 0.95157117 1.0 -0.72135293
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-1.0 -0.09999584 -1.0 -0.53164005
1.0 -0.26913226 1.0 0.68182015
-0.94981074 0.80879736 -1.0 -0.88602054
1.0 0.53378004 1.0 0.24678802
1.0 0.42213318 1.0 -0.9853471
1.0 0.95567626 1.0 -0.95536
1.0 -1.0 1.0 0.7870593
-1.0 0.5791446 1.0 0.95876324
1.0 -1.0 1.0 0.99422586
-1.0 1.0 -1.0 -0.9597837
1.0 -0.42751998 -1.0 -0.9367701
1.0 -1.0 -1.0 0.98829985
0.35705855 1.0 -1.0 0.9861374
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1.0 0.76063955 -1.0 0.99232876
-1.0 0.07206341 1.0 -0.9953229
1.0 0.006526853 -1.0 -0.7442181
1.0 -1.0 1.0 0.92748725
1.0 -0.27815282 1.0 -0.9505197
-1.0 -1.0 1.0 -0.9495854
rewards 1.6353582906311146
turbulence 17.329999923706055
trade: 3468
cost: 3967.8406533832635
-1.0 0.00835079 -1.0 0.9349754
-1.0 -0.06733777 -1.0 0.8506267
-1.0 -0.38235244 1.0 0.00950253
-1.0 0.21424563 -1.0 0.991534
0.69374883 1.0 1.0 0.898607
-1.0 0.4491858 -1.0 0.99416137
1.0 -0.022902578 1.0 0.95447385
```

```
1.0 0.66401136 1.0 -0.68918604
1.0 1.0 1.0 -0.8939128
-1.0 -0.41547093 -1.0 0.3646109
1.0 0.63194364 1.0 -0.7638476
-1.0 -0.39767593 -1.0 -0.81029487
1.0 1.0 1.0 0.24237299
1.0 1.0 1.0 -0.93504155
1.0 1.0 1.0 -0.9031767
1.0 -0.5019721 1.0 0.8930118
1.0 -1.0 1.0 0.992666
1.0 0.71150327 1.0 0.9497653
0.27479315 -1.0 -1.0 -0.9759724
1.0 -1.0 -1.0 -0.2531494
-0.87196386 -0.7454623 -1.0 0.9589585
1.0 1.0 -1.0 0.93732
-1.0 -0.39319068 -1.0 -0.9763059
1.0 -0.5367217 -1.0 0.98498774
-0.45948815 0.3343787 1.0 -0.6444992
1.0 1.0 -1.0 -0.9905445
1.0 -0.847451 1.0 0.7777184
-0.10997749 0.13562715 1.0 -0.95734775
-0.94214094 -1.0 1.0 -0.7292857
rewards -0.5069845578887966
turbulence 17.639999389648438
trade: 3486
cost: 3979.586790742883
-0.4550712 -0.10227972 -1.0 0.84518707
-1.0 1.0 -1.0 0.46584857
-1.0 1.0 1.0 -0.37791872
-1.0 0.062365532 -1.0 0.97112274
-1.0 -1.0 1.0 0.9301933
-1.0 -0.24354699 -1.0 0.9800892
-0.5782821 -0.31528455 1.0 0.8919853
0.18605447 -0.47075814 1.0 -0.81575245
-0.2758423 -0.18495795 1.0 -0.9145518
-1.0 0.36100593 -1.0 -0.7939655
1.0 -0.5113706 1.0 0.7088243
-1.0 1.0 -1.0 -0.9869707
-1.0 -0.3191664 1.0 -0.10536593
1.0 0.21020089 1.0 -0.949507
1.0 0.13309939 1.0 -0.669279
1.0 0.14673194 1.0 0.97502697
1.0 1.0 1.0 0.9639609
1.0 1.0 1.0 0.93458927
1.0 1.0 -1.0 -0.98142475
1.0 -1.0 -1.0 -0.9741749
1.0 -0.32514498 -1.0 0.9406073
-1.0 0.71561074 -1.0 0.9884505
```

```
-0.9858861 0.18968734 -1.0 -0.980618
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-1.0 1.0 1.0 -0.89572734
1.0 -1.0 -1.0 -0.9229235
1.0 0.47989792 1.0 0.92479134
1.0 -1.0 1.0 -0.87380874
-1.0 -0.5891294 1.0 -0.98522997
rewards -0.016032501904293894
turbulence 17.559999465942383
trade: 3502
cost: 3981.8258226947873
-1.0 -0.28730962 -1.0 0.97915614
-1.0 1.0 -1.0 0.45224392
-1.0 -0.34935248 1.0 -0.9351654
-0.8897263 -0.1882012 -1.0 0.9915507
0.22173566 -1.0 1.0 0.95664
-1.0 -0.44110683 -1.0 0.9527304
1.0 0.48911947 1.0 0.911579
-1.0 0.7663167 1.0 -0.83739436
-1.0 0.99634224 1.0 -0.27208984
-1.0 -1.0 -1.0 -0.67691654
1.0 1.0 1.0 0.6071429
-1.0 -0.18205334 -1.0 -0.95936143
1.0 0.78663796 1.0 -0.66984534
1.0 1.0 1.0 -0.9864834
1.0 -1.0 1.0 -0.89180726
1.0 0.120830595 1.0 0.66065645
0.83772415 -1.0 1.0 0.9846506
-0.70510125 0.7814913 1.0 0.8650789
1.0 1.0 -1.0 -0.88934237
1.0 0.35910875 -1.0 -0.7762671
-0.27867165 -1.0 -1.0 0.9741056
-0.5112312 0.386239 -1.0 0.8933108
-1.0 1.0 -1.0 -0.96906155
1.0 1.0 -1.0 0.97655153
0.20471027 -1.0 1.0 -0.9130043
1.0 -0.6248901 -1.0 -0.9681193
1.0 -0.12285206 1.0 0.11751795
-0.6137262 1.0 1.0 -0.9649651
-1.0 -0.5274992 1.0 -0.96065897
rewards -1.2267750745079016
turbulence 17.280000686645508
trade: 3517
cost: 4003.925707941064
-1.0 -1.0 -1.0 0.6901276
-1.0 1.0 -1.0 0.9535005
-0.5061109 0.47960952 1.0 0.17232215
-1.0 0.39307505 -1.0 0.9933295
```

```
-0.079689756 -1.0 1.0 0.7089653
-1.0 1.0 -1.0 0.9066181
-1.0 0.24820152 1.0 0.97594
1.0 0.15350312 1.0 -0.79882216
0.114245005 -0.38285416 1.0 -0.8825209
-1.0 -0.6065809 -1.0 -0.51221204
1.0 0.5024425 1.0 -0.024027586
-1.0 0.8089985 -1.0 -0.9752688
1.0 1.0 1.0 0.8499253
1.0 1.0 1.0 -0.9820636
1.0 -0.47210795 1.0 -0.9634158
1.0 1.0 1.0 0.4812069
1.0 -1.0 1.0 0.97930765
1.0 -0.89184856 1.0 0.95210147
0.51746905 0.41799572 -1.0 -0.9926162
1.0 -0.5888119 -1.0 -0.9040631
0.04213871 1.0 -1.0 0.9856398
-0.98933566 1.0 -1.0 0.6821238
-1.0 0.9711865 -1.0 -0.97924924
1.0 0.9309243 -1.0 0.9866674
-0.091795444 0.58623785 1.0 -0.7793662
1.0 1.0 -1.0 -0.98705786
1.0 -0.4453306 1.0 0.76527476
-1.0 0.71909475 1.0 -0.9395071
-1.0 1.0 1.0 -0.9909271
rewards 0.6784312924312428
turbulence 17.610000610351562
trade: 3535
cost: 4011.8231145916075
-1.0 0.5630901 -1.0 0.94309783
-1.0 -0.666806 -1.0 0.7421601
-1.0 0.65841705 1.0 -0.550444
-0.8774301 0.57933646 -1.0 0.9309472
-0.2512542 -0.7350888 1.0 0.6327051
-1.0 1.0 -1.0 0.92816687
1.0 0.48063642 1.0 0.96957684
1.0 -0.41636887 1.0 -0.8452506
0.042992793 -0.769303 1.0 -0.9873499
-1.0 1.0 -1.0 -0.17431843
1.0 0.3386786 1.0 -0.02939713
-1.0 0.5039959 -1.0 -0.90211433
0.61123836 -1.0 1.0 0.8539665
1.0 0.7519467 1.0 -0.95847094
1.0 -1.0 1.0 -0.9480115
1.0 1.0 1.0 0.8576002
0.36423695 0.18226445 1.0 0.99385047
1.0 -1.0 1.0 0.89437926
1.0 -1.0 -1.0 -0.95300394
```

```
1.0 0.39617956 -1.0 -0.9128341
-0.7541263 0.22367723 -1.0 0.9855205
0.66928434 -0.07618056 -1.0 0.9713905
-1.0 -1.0 -1.0 -0.97981006
1.0 0.95567465 -1.0 0.953125
-1.0 -0.10377012 1.0 -0.58720624
1.0 1.0 -1.0 -0.62044096
1.0 -1.0 1.0 0.9575082
1.0 -0.25546378 1.0 -0.952935
-0.84512305 1.0 1.0 -0.9666393
rewards -0.5743505081176759
turbulence 18.61000061035156
trade: 3550
cost: 4011.8231145916075
-1.0 0.4116331 -1.0 0.99028206
-1.0 -0.039494887 -1.0 0.9590552
-1.0 1.0 1.0 -0.85547835
-1.0 0.7065353 -1.0 0.93102
-0.2927608 1.0 1.0 0.97637427
-1.0 0.6274009 -1.0 0.9560492
1.0 1.0 1.0 0.95074964
1.0 -0.35027766 1.0 0.37369287
0.46732384 1.0 1.0 -0.9174486
-1.0 0.4686879 -1.0 -0.46882796
1.0 -0.95017874 1.0 0.9711549
-1.0 0.32583505 -1.0 -0.9125766
0.9558269 1.0 1.0 0.81857693
1.0 -0.91969323 1.0 -0.9573252
1.0 0.03426984 1.0 -0.93054557
1.0 -0.4074431 1.0 0.8807237
0.37497848 -0.22272418 1.0 0.9913882
1.0 0.6074119 1.0 0.8953483
1.0 0.86652946 -1.0 -0.89541805
1.0 -0.11457227 -1.0 -0.87837654
0.7097955 0.4837091 -1.0 0.9945972
-0.050341293 1.0 -1.0 0.9865205
-1.0 0.30011833 -1.0 -0.97850156
1.0 0.71513754 -1.0 0.97136354
1.0 1.0 1.0 -0.88291144
1.0 1.0 -1.0 -0.9834071
1.0 -0.6882249 1.0 0.8711426
-1.0 0.81047827 1.0 -0.9827046
-1.0 0.682863 1.0 -0.97612333
rewards 0.6851989491134649
turbulence 18.309999465942383
trade: 3569
cost: 4012.0496459484193
-1.0 -1.0 -1.0 0.82123613
```

```
-1.0 1.0 -1.0 0.9531393
-1.0 1.0 1.0 -0.94263124
-1.0 -0.67313135 -1.0 0.97979045
0.18370414 1.0 1.0 0.52833045
-0.7213048 -1.0 -1.0 0.9468782
1.0 0.79962164 1.0 0.9911164
1.0 -1.0 1.0 -0.60480547
0.40189093 -0.83654267 1.0 -0.83620524
-1.0 0.64130026 -1.0 -0.3154254
1.0 -1.0 1.0 0.6234641
-1.0 -1.0 -1.0 -0.9622643
0.60374343 0.61546254 1.0 0.9846605
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1.0 -1.0 1.0 -0.98377687
1.0 1.0 1.0 0.80255914
1.0 0.22865564 1.0 0.9678602
0.03845942 -0.5249586 1.0 0.92189777
1.0 -1.0 -1.0 -0.9597409
1.0 0.28500104 -1.0 -0.9922341
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-1.0 0.17898726 -1.0 -0.8423692
1.0 0.78863907 -1.0 0.98667467
-0.38010728 -0.21829994 1.0 -0.81021714
1.0 0.45251495 -1.0 -0.7582089
1.0 0.9981468 1.0 0.86414194
-0.34587288 1.0 1.0 -0.9234086
-0.52302694 1.0 1.0 -0.9553901
rewards 0.36056984273225534
turbulence 19.479999542236328
trade: 3583
cost: 4037.4970545024967
-1.0 -1.0 -1.0 0.98622453
-1.0 -0.78834593 -1.0 0.95984244
-0.40493822 0.46603084 1.0 -0.40865588
-1.0 -1.0 -1.0 0.9858296
-0.99264324 1.0 1.0 0.71763563
0.118177414 1.0 -1.0 0.6220225
1.0 1.0 1.0 0.85527706
1.0 -1.0 1.0 0.11818683
-0.67731994 0.5633737 1.0 -0.9418328
-1.0 -0.9414395 -1.0 0.11008382
1.0 -0.26126996 1.0 0.1889683
-1.0 -1.0 -1.0 -0.7877403
0.77232337 1.0 1.0 0.94852495
1.0 1.0 1.0 -0.90772647
1.0 -1.0 1.0 -0.8205055
1.0 0.64091337 1.0 -0.16984195
```

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-0.9996306 -1.0 1.0 0.9512441
0.90780354 -0.6083802 1.0 0.7937777
1.0 -1.0 -1.0 -0.96273565
1.0 -1.0 -1.0 -0.875755
1.0 1.0 -1.0 0.9828584
-0.2292304 1.0 -1.0 0.69494605
-0.8062842 -0.030857772 -1.0 -0.9964175
1.0 0.5613813 -1.0 0.956836
0.64244366 -0.82955307 1.0 -0.94188875
1.0 0.637643 -1.0 -0.8776565
1.0 -0.20205832 1.0 0.71219933
-0.10209429 0.115354 1.0 -0.7553712
-1.0 -0.7394605 1.0 -0.98252934
rewards 0.7543225678512361
turbulence 19.149999618530277
trade: 3599
cost: 4057.177721357355
0.46977925 -1.0 -1.0 0.9198191
-1.0 -0.7731524 -1.0 0.96989465
-1.0 0.41868258 1.0 0.7243769
-1.0 0.09221907 -1.0 0.946149
-0.39143592 1.0 1.0 0.8511723
-1.0 -0.563864 -1.0 0.9683757
0.5925479 0.112341 1.0 0.976436
1.0 1.0 1.0 0.121394634
0.775224 1.0 1.0 -0.7752776
-1.0 -0.6583856 -1.0 -0.15759617
1.0 -0.9399609 1.0 0.25115263
-1.0 1.0 -1.0 -0.9772235
1.0 -0.06268872 1.0 -0.7130151
1.0 0.20911476 1.0 -0.99118537
1.0 -1.0 1.0 -0.97605294
1.0 -1.0 1.0 -0.21039915
1.0 1.0 1.0 0.94739795
1.0 -1.0 1.0 0.98800445
1.0 -0.43447027 -1.0 -0.9017623
1.0 0.6915301 -1.0 -0.87549806
0.19567573 1.0 -1.0 0.9493519
0.2812845 -0.29826167 -1.0 0.9016628
-1.0 -0.70174545 -1.0 -0.97762316
1.0 0.58760214 -1.0 0.99338436
-0.5781529 1.0 1.0 -0.7564819
1.0 0.99459326 -1.0 -0.98468953
1.0 1.0 1.0 0.08703017
0.0706871 0.62114894 1.0 -0.69691634
-1.0 0.99990565 1.0 -0.9888366
rewards 1.198490435520187
turbulence 18.38999938964844
```

```
trade: 3617
cost: 4063.5954105281926
-1.0 -1.0 -1.0 0.8902919
-1.0 1.0 -1.0 0.8575965
-1.0 0.37241152 1.0 -0.23234123
-0.82923865 1.0 -1.0 0.97761154
-1.0 0.06989904 1.0 0.4077103
-1.0 -0.2400234 -1.0 0.92266655
1.0 1.0 1.0 0.9697902
1.0 -0.2740356 1.0 -0.82824624
0.052588098 1.0 1.0 -0.9186919
-1.0 0.44107097 -1.0 -0.901357
1.0 0.25464544 1.0 0.07598734
-0.7207775 0.81277984 -1.0 -0.867809
1.0 0.91259557 1.0 0.71635616
1.0 0.0036922395 1.0 -0.8862905
1.0 -0.8653075 1.0 -0.9726151
1.0 -0.41137156 1.0 0.44280863
1.0 -1.0 1.0 0.98489475
1.0 -1.0 1.0 0.9610133
1.0 1.0 -1.0 -0.928214
1.0 0.58732617 -1.0 -0.9851791
-0.46957648 -1.0 -1.0 0.98779523
0.44397107 1.0 -1.0 0.97403634
-1.0 -0.67031854 -1.0 -0.4403385
1.0 -0.9301344 -1.0 0.99575496
1.0 1.0 1.0 -0.99117506
1.0 -1.0 -1.0 -0.83154917
1.0 -0.42901704 1.0 0.74237776
0.4192297 0.6202196 1.0 -0.9689328
-1.0 1.0 1.0 -0.967986
rewards 1.4242720637267923
turbulence 16.690000534057617
trade: 3635
cost: 4084.945039983759
0.9551114 1.0 -1.0 0.9578886
-1.0 -0.21963544 -1.0 0.82218814
-0.8128222 -1.0 1.0 -0.66753304
-1.0 -0.4542821 -1.0 0.9595095
-0.030451268 -0.8483067 1.0 0.5658189
0.11457181 -0.56978273 -1.0 0.96223927
1.0 0.43358743 1.0 0.94669676
1.0 -0.31107384 1.0 -0.67952764
0.14567636 -0.06397166 1.0 -0.81650376
-1.0 -0.9440297 -1.0 -0.33265978
1.0 1.0 1.0 0.07610381
-1.0 1.0 -1.0 -0.7623026
0.5929949 1.0 1.0 0.40611315
```

```
1.0 0.7322842 1.0 -0.98828936
1.0 0.49855173 1.0 -0.9453475
1.0 1.0 1.0 0.5938015
-0.48600864 -0.044656903 1.0 0.9813373
1.0 1.0 1.0 0.9291378
1.0 -0.8047977 -1.0 -0.9929148
1.0 -0.27231932 -1.0 -0.9216106
0.4896956 1.0 -1.0 0.9786942
0.16323912 -0.2691211 -1.0 0.924495
-1.0 1.0 -1.0 -0.8671212
1.0 -0.11856812 -1.0 0.9805312
-1.0 -0.3634395 1.0 -0.37590528
1.0 -1.0 -1.0 -0.78990215
1.0 -1.0 1.0 0.43949795
0.9744338 -0.10673982 1.0 -0.9950947
-1.0 -1.0 1.0 -0.97121185
rewards -0.26236976952818225
turbulence 19.65999984741211
trade: 3651
cost: 4091.5037391414744
-0.2979527 0.049037367 -1.0 0.9966763
-1.0 -0.3315787 -1.0 -0.03375566
-0.7306893 -0.44308567 1.0 -0.8056174
-1.0 0.36814678 -1.0 0.9930583
-1.0 -1.0 1.0 0.6083187
-1.0 1.0 -1.0 0.53032994
1.0 -0.48757625 1.0 0.95542765
0.6322028 0.19277714 1.0 -0.77485925
1.0 -1.0 1.0 -0.88779193
-1.0 1.0 -1.0 -0.66943944
1.0 0.24092966 1.0 0.81396365
-1.0 -1.0 -1.0 -0.8669764
1.0 0.33441794 1.0 0.58755875
1.0 -0.4274802 1.0 -0.76883817
1.0 -1.0 1.0 -0.90353024
0.93982923 0.3044981 1.0 0.7730243
1.0 -1.0 1.0 0.9694669
1.0 1.0 1.0 0.78600514
1.0 1.0 -1.0 -0.98094875
1.0 1.0 -1.0 -0.85933393
0.011622101 -0.71461546 -1.0 0.99345565
-0.85896647 -0.089671254 -1.0 0.901283
-1.0 -0.10462345 -1.0 -0.66650736
1.0 1.0 -1.0 0.98833156
-1.0 -0.6167512 1.0 -0.9703135
1.0 0.637947 -1.0 -0.9872578
1.0 0.22736982 1.0 0.27837646
0.961223 -0.7567512 1.0 -0.9755625
```

```
-1.0 -1.0 1.0 -0.9626957
rewards -2.1853778046116
turbulence 21.84000015258789
trade: 3666
cost: 4093.6239330844983
-1.0 0.4008766 -1.0 0.8396499
-1.0 -0.053003967 -1.0 0.47524023
-1.0 0.71162224 1.0 -0.8637699
-1.0 -0.31793082 -1.0 0.9887371
1.0 0.5364169 1.0 0.9206419
-1.0 -0.6648691 -1.0 0.90061116
0.69628674 0.64943933 1.0 0.96827435
1.0 -1.0 1.0 -0.15335238
-0.48105866 0.6103546 1.0 -0.92881036
-1.0 0.17499259 -1.0 -0.3729769
1.0 1.0 1.0 0.30264354
-1.0 1.0 -1.0 -0.9754678
1.0 -1.0 1.0 0.18836021
1.0 0.46083313 1.0 -0.9690401
1.0 1.0 1.0 -0.94556093
1.0 -0.29291335 1.0 0.7801435
0.81994987 0.10692266 1.0 0.98981106
1.0 -1.0 1.0 0.97200775
1.0 0.047401175 -1.0 -0.9828347
1.0 -0.15223497 -1.0 -0.99171644
-1.0 -1.0 -1.0 0.94394016
-0.31649333 0.47055084 -1.0 0.5686015
-1.0 -0.4981277 -1.0 -0.9592319
1.0 0.688445 -1.0 0.8598938
1.0 -0.13605037 1.0 -0.93059695
1.0 -1.0 -1.0 -0.8896375
1.0 -0.23189929 1.0 0.8815665
0.408085 1.0 1.0 -0.98569065
-1.0 -0.88970244 1.0 -0.9811047
rewards -2.6978613642249956
turbulence 27.59000015258789
trade: 3681
cost: 4108.105441850672
-0.672862 1.0 -1.0 0.97013664
-1.0 -1.0 -1.0 0.38557744
-1.0 -0.7950705 1.0 -0.80746704
-1.0 1.0 -1.0 0.9587176
-1.0 0.751198 1.0 0.5889404
-1.0 -1.0 -1.0 0.9441929
0.35967684 1.0 1.0 0.751878
1.0 0.47579592 1.0 0.60234046
-0.36335182 1.0 1.0 -0.8179009
-1.0 1.0 -1.0 -0.5904257
```

```
1.0 0.45614243 1.0 -0.035873413
-1.0 -0.22775538 -1.0 -0.9670338
1.0 -0.9877386 1.0 0.90418935
1.0 -0.61672133 1.0 -0.97643274
1.0 -1.0 1.0 -0.8343133
1.0 0.26485533 1.0 0.36880314
1.0 -1.0 1.0 0.982368
-0.6257181 0.98334515 1.0 0.97621346
0.042846918 -1.0 -1.0 -0.5621803
1.0 1.0 -1.0 -0.8644887
0.5112852 0.34068334 -1.0 0.9918566
1.0 0.17359474 -1.0 0.99883556
-1.0 0.57242095 -1.0 -0.91849524
1.0 -0.6108124 -1.0 0.9839556
-1.0 -0.37216586 1.0 -0.82911855
1.0 -1.0 -1.0 -0.8845404
1.0 0.2848706 1.0 0.55551255
-1.0 -0.3114101 1.0 -0.7822235
-0.3504821 0.25228932 1.0 -0.98316634
rewards 2.3595918787971373
turbulence 23.1299991607666
trade: 3696
cost: 4108.200745370874
0.73587966 0.13600871 -1.0 0.88437116
-1.0 0.22238588 -1.0 0.91120696
-1.0 -0.9480972 1.0 -0.87113225
-0.8715378 -0.7194885 -1.0 0.92027795
-0.12151518 -1.0 1.0 0.7560365
-1.0 0.69021195 -1.0 0.87362623
-0.65602136 -0.21020621 1.0 0.98384273
1.0 0.87121296 1.0 -0.63507247
-1.0 1.0 1.0 -0.38894993
-1.0 -0.16792016 -1.0 -0.06847572
1.0 -1.0 1.0 0.64421964
-1.0 -0.15788376 -1.0 -0.9704891
0.9990453 1.0 1.0 -0.22026932
1.0 -0.7339082 1.0 -0.92923814
1.0 -1.0 1.0 -0.9464791
0.9124912 -1.0 1.0 0.87274456
1.0 -1.0 1.0 0.98073816
1.0 -0.49551684 1.0 0.9456819
1.0 -0.3286686 -1.0 -0.5317261
1.0 -0.13071059 -1.0 -0.86991745
0.14229904 -0.82946604 -1.0 0.9902934
1.0 1.0 -1.0 0.9550371
-1.0 -1.0 -1.0 -0.9629922
1.0 -0.36372927 -1.0 0.9891112
-1.0 1.0 1.0 -0.86593294
```

```
1.0 -0.5528833 -1.0 -0.450534
1.0 0.14859694 1.0 -0.4282136
-0.6323038 -0.6131036 1.0 -0.9200487
-0.69597304 0.3601041 1.0 -0.95689964
rewards 2.140288402557373
turbulence 18.809999465942383
trade: 3711
cost: 4108.200745370874
-0.8541039 -0.57934856 -1.0 0.9730183
-1.0 -0.426296 -1.0 0.92953897
-0.7117574 0.3605141 1.0 -0.30105108
-0.84340465 -1.0 -1.0 0.9806299
-1.0 -0.7888994 1.0 0.7196398
-1.0 1.0 -1.0 0.89965296
1.0 1.0 1.0 0.97717047
1.0 -1.0 1.0 -0.8243928
1.0 1.0 1.0 -0.86906856
-1.0 1.0 -1.0 -0.8874034
1.0 -1.0 1.0 0.8840332
-0.8165114 -1.0 -1.0 -0.92352855
-0.91255164 1.0 1.0 0.7520603
1.0 1.0 1.0 -0.98651785
1.0 -0.5599848 1.0 -0.5223165
1.0 0.06836349 1.0 0.9441242
1.0 0.21689242 1.0 0.9514241
1.0 1.0 1.0 0.98014665
1.0 0.64502865 -1.0 -0.9283405
1.0 -1.0 -1.0 -0.93201184
-0.49268812 -1.0 -1.0 0.9756119
1.0 -0.21538955 -1.0 0.97114706
-1.0 -0.3277768 -1.0 -0.94934815
1.0 0.6862486 -1.0 0.94207525
-1.0 0.067304894 1.0 -0.70308906
1.0 0.12531386 -1.0 -0.9678012
1.0 -0.054403335 1.0 0.8411553
0.2988515 -0.34238544 1.0 -0.9887541
-1.0 -0.46100324 1.0 -0.9751756
rewards -0.06070608782728669
turbulence 19.71999931335449
trade: 3726
cost: 4126.5294192066285
-0.70328236 -0.8560337 -1.0 0.92712545
-1.0 -0.19080281 -1.0 -0.36644316
-0.39830983 0.89885414 1.0 -0.8076867
-0.14075112 -1.0 -1.0 0.97791064
-0.16193514 1.0 1.0 0.9827428
-1.0 0.9556722 -1.0 0.9802636
-0.10135245 0.35859054 1.0 0.7665055
```

```
1.0 -0.10031942 1.0 -0.2593003
0.37114683 0.084866956 1.0 -0.9818442
-1.0 -1.0 -1.0 -0.62254643
1.0 -1.0 1.0 0.1047796
-1.0 -1.0 -1.0 -0.9254625
0.81959814 1.0 1.0 0.6064285
1.0 1.0 1.0 -0.98369503
1.0 -1.0 1.0 -0.9658795
1.0 -0.71740603 1.0 0.77388835
0.5890987 -1.0 1.0 0.97754693
0.9144957 -1.0 1.0 0.94235134
1.0 0.9444309 -1.0 -0.9679754
1.0 -0.72315866 -1.0 -0.91394454
1.0 -0.26305187 -1.0 0.94049215
0.5226501 0.29666066 -1.0 0.9373524
-1.0 -0.10175075 -1.0 -0.94559336
1.0 -0.13459668 -1.0 0.9979688
-0.9143046 -1.0 1.0 -0.29495794
1.0 -0.11554849 -1.0 -0.9792117
1.0 0.35741472 1.0 -0.24573755
0.100968435 -0.94553804 1.0 -0.7930382
-1.0 0.5108603 1.0 -0.9573869
rewards -1.8801678296108266
turbulence 21.34000015258789
trade: 3741
cost: 4132.74851350213
0.76950383 -0.40685716 -1.0 0.41853607
-1.0 1.0 -1.0 0.92060375
-1.0 1.0 1.0 -0.12936443
-0.3767352 -0.9989022 -1.0 0.9642601
-0.1178091 -1.0 1.0 0.9055244
-1.0 -1.0 -1.0 0.28615105
0.6286472 0.7389183 1.0 0.9437455
1.0 -0.7714938 1.0 -0.599641
-1.0 0.6886576 1.0 -0.9007261
-1.0 0.19020137 -1.0 0.21063268
1.0 0.24456802 1.0 -0.53538495
-1.0 -1.0 -1.0 -0.9501651
1.0 -0.15327895 1.0 0.36755037
1.0 -0.47311342 1.0 -0.98466045
1.0 0.86057377 1.0 -0.928404
1.0 -0.9389014 1.0 0.77755284
1.0 -0.08769983 1.0 0.9812602
1.0 -1.0 1.0 0.94828486
0.7993917 1.0 -1.0 -0.99056756
1.0 0.39135343 -1.0 -0.93250144
-0.56008106 0.4752863 -1.0 0.99182737
3.707409e-05 1.0 -1.0 0.9851041
```

```
-0.80985403 -1.0 -1.0 -0.8928125
1.0 1.0 -1.0 0.9904988
0.37196916 1.0 1.0 -0.9367199
1.0 -0.19485128 -1.0 -0.91364604
1.0 1.0 1.0 -0.04430139
0.54304487 -0.70343685 1.0 -0.97314876
-1.0 1.0 1.0 -0.9730173
rewards -0.8120254530139966
turbulence 22.18000030517578
trade: 3758
cost: 4133.075232973108
-1.0 1.0 -1.0 0.9388114
-1.0 0.34094143 -1.0 0.6675042
-1.0 1.0 1.0 0.19919062
-1.0 -1.0 -1.0 0.8942176
0.5754322 1.0 1.0 0.2550398
-1.0 0.41192794 -1.0 0.9349046
1.0 1.0 1.0 0.7128737
1.0 0.51891184 1.0 -0.8964491
-0.34816295 0.50988555 1.0 -0.95578784
-1.0 0.903227 -1.0 -0.49983555
1.0 1.0 1.0 0.46126914
-1.0 1.0 -1.0 -0.97287375
1.0 1.0 1.0 0.9467387
1.0 1.0 1.0 -0.9786048
1.0 -0.9912023 1.0 -0.9864757
1.0 -0.03488937 1.0 0.8999529
1.0 -1.0 1.0 0.979918
0.7818918 -0.3194806 1.0 0.96874094
1.0 -1.0 -1.0 -0.9941117
1.0 0.7889495 -1.0 -0.9633151
0.94451344 1.0 -1.0 0.98565984
1.0 1.0 -1.0 0.9863273
-1.0 -0.20915188 -1.0 -0.93936515
1.0 -1.0 -1.0 0.91961694
-1.0 0.54715383 1.0 -0.8217967
1.0 1.0 -1.0 -0.7993981
1.0 1.0 1.0 0.86991835
-0.4891098 0.26761764 1.0 -0.88981575
-1.0 0.5033549 1.0 -0.9890555
rewards 0.9217704833984376
turbulence 20.670000076293945
trade: 3775
cost: 4133.075232973108
0.74799454 0.6406989 -1.0 0.98129344
-1.0 0.84380263 -1.0 0.7573886
-1.0 1.0 1.0 0.6212909
0.33008933 -1.0 -1.0 0.9771496
```

```
-1.0 -0.85411865 1.0 0.94925404
-1.0 0.8456847 -1.0 0.99104977
1.0 0.07199074 1.0 0.8619094
1.0 -0.30039042 1.0 -0.80393565
0.51702446 1.0 1.0 -0.8717704
-1.0 -0.49565428 -1.0 -0.16789258
1.0 -0.6935539 1.0 -0.6542746
-1.0 0.53845197 -1.0 -0.9770052
1.0 0.67363757 1.0 0.64991164
1.0 1.0 1.0 -0.9791255
1.0 -1.0 1.0 -0.8635903
1.0 1.0 1.0 0.96008706
1.0 0.42044505 1.0 0.9855921
0.252473 1.0 1.0 0.9799671
1.0 -0.41803926 -1.0 -0.9505404
1.0 0.51662874 -1.0 -0.8419774
0.5530054 -1.0 -1.0 0.9396821
-0.058257937 -1.0 -1.0 0.970839
-1.0 -0.04560727 -1.0 -0.6098505
1.0 0.57719386 -1.0 0.92852616
0.5229676 1.0 1.0 -0.8249285
1.0 1.0 -1.0 -0.77635276
1.0 1.0 1.0 0.111298084
-0.53160465 0.1697649 1.0 -0.9746786
-1.0 1.0 1.0 -0.9819209
rewards 0.07534757362061646
turbulence 20.149999618530277
trade: 3793
cost: 4139.820604249963
0.13027859 -1.0 -1.0 0.7976737
-1.0 0.95568496 -1.0 0.8909024
-1.0 -1.0 1.0 -0.69619703
-1.0 -1.0 -1.0 0.96289825
1.0 1.0 1.0 0.91674733
-0.46685016 -0.40153268 -1.0 0.934706
1.0 0.13488722 1.0 0.9480003
0.3599887 0.104408935 1.0 -0.09266871
-0.49938136 -0.4395128 1.0 -0.9396904
-1.0 0.5432748 -1.0 -0.53514445
1.0 -0.0011998117 1.0 -0.92135316
-1.0 1.0 -1.0 -0.59374493
1.0 -0.73154056 1.0 -0.21745336
1.0 -1.0 1.0 -0.9339929
1.0 -0.36565846 1.0 -0.954138
1.0 -1.0 1.0 0.91893923
-0.060931087 -0.5126648 1.0 0.95786846
0.60891044 0.20211634 1.0 0.95207787
-0.12254989 0.119564295 -1.0 -0.9775188
```

```
1.0 -0.218653 -1.0 -0.9025811
1.0 0.83996564 -1.0 0.9626372
-0.84114146 0.86027765 -1.0 0.9130539
-1.0 -1.0 -1.0 -0.93910843
1.0 0.104887426 -1.0 0.9926548
-0.75742257 -1.0 1.0 -0.98862743
1.0 -0.64338547 -1.0 -0.8193593
1.0 1.0 1.0 0.929883
-1.0 -0.9175972 1.0 -0.9954447
-0.20666456 -1.0 1.0 -0.95864624
rewards 0.9568020591689973
turbulence 18.399999618530277
trade: 3806
cost: 4146.052206010828
0.007439971 0.13729808 -1.0 0.87758243
-1.0 -0.079084456 -1.0 0.81422234
-0.88000274 1.0 1.0 -0.97481644
-1.0 1.0 -1.0 0.98694897
-0.19505632 1.0 1.0 0.92987525
-1.0 1.0 -1.0 0.99218535
1.0 1.0 1.0 0.781924
1.0 1.0 1.0 -0.92073435
-0.08057084 -1.0 1.0 -0.951842
-1.0 -1.0 -1.0 0.42902637
1.0 -0.94094175 1.0 0.24346209
-1.0 -0.5438154 -1.0 -0.9785939
1.0 -0.6739049 1.0 -0.64782035
1.0 -1.0 1.0 -0.943192
1.0 -1.0 1.0 -0.9285911
1.0 -1.0 1.0 0.9097887
0.5090182 -0.94680786 1.0 0.94198453
1.0 1.0 1.0 0.92504346
1.0 0.33182365 -1.0 -0.9927436
1.0 0.2990572 -1.0 -0.962334
-0.6140403 -1.0 -1.0 0.97050786
0.38956246 0.024463952 -1.0 0.92737305
-1.0 0.6608623 -1.0 -0.9552747
1.0 -0.4830911 -1.0 0.78406596
-1.0 1.0 1.0 -0.9526656
1.0 0.97236305 -1.0 -0.98318344
1.0 1.0 1.0 0.89981866
1.0 1.0 1.0 -0.97337186
-1.0 -0.35620445 1.0 -0.99406195
rewards -0.8365050620666472
turbulence 18.84000015258789
trade: 3821
cost: 4159.794702135095
-0.68445075 1.0 -1.0 0.96243143
```

```
-1.0 -0.037279427 -1.0 0.8652935
-0.7414222 0.77412564 1.0 0.6725576
-1.0 1.0 -1.0 0.8773627
0.054411955 -0.6902845 1.0 0.6792759
-0.5294307 0.19533493 -1.0 0.92132926
1.0 0.50036454 1.0 0.5003303
1.0 0.31327516 1.0 -0.08756113
-1.0 -0.3244129 1.0 -0.8592826
-1.0 -1.0 -1.0 -0.5238734
1.0 -0.3071087 1.0 0.10317671
-1.0 1.0 -1.0 -0.9541265
0.8694146 -1.0 1.0 0.9108596
1.0 -0.7645717 1.0 -0.9895194
1.0 -0.79622865 1.0 -0.9500427
1.0 -1.0 1.0 0.7749593
1.0 0.9229601 1.0 0.9925877
1.0 -0.92850035 1.0 0.7366487
0.40347528 0.4585336 -1.0 -0.9931171
1.0 -1.0 -1.0 -0.9825749
-0.36955577 1.0 -1.0 0.9763124
-0.62700695 -0.5127092 -1.0 0.92973435
-1.0 -1.0 -1.0 -0.95501363
1.0 0.004803568 -1.0 0.9957688
0.050131917 1.0 1.0 -0.89622617
1.0 0.86367404 -1.0 -0.9071344
1.0 -1.0 1.0 0.18245614
-0.8796426 0.5854299 1.0 -0.98700994
-1.0 -0.61080325 1.0 -0.98994714
rewards 0.5582956713577267
turbulence 17.360000610351562
trade: 3839
cost: 4164.348486604698
0.35546052 -0.80616546 -1.0 0.5920701
-1.0 0.8853358 -1.0 0.28048587
-1.0 0.653144 1.0 -0.7710205
-0.62364984 0.13650256 -1.0 0.99835455
0.76924616 0.8987089 1.0 0.8000932
-1.0 0.48487115 -1.0 0.9782064
1.0 0.9987495 1.0 0.993817
0.7512565 0.5935643 1.0 -0.9164409
-1.0 -0.842557 1.0 -0.9637093
-1.0 -0.5252777 -1.0 0.71580684
1.0 0.12617329 1.0 -0.31038988
-1.0 0.5015817 -1.0 -0.9893405
1.0 0.17218322 1.0 0.35076177
1.0 0.51893926 1.0 -0.91570157
1.0 1.0 1.0 -0.93159527
1.0 0.97317874 1.0 0.91815114
```

```
1.0 0.20805731 1.0 0.9997841
1.0 -1.0 1.0 0.91790533
1.0 0.23525217 -1.0 -0.87575746
1.0 0.2470746 -1.0 -0.9622272
0.67368275 1.0 -1.0 0.96589756
0.6981882 1.0 -1.0 0.9894588
-1.0 0.114833415 -1.0 -0.983305
1.0 -1.0 -1.0 0.93559
-1.0 -0.328512 1.0 -0.93722224
1.0 -1.0 -1.0 -0.46502012
1.0 -0.4408294 1.0 0.36072326
1.0 -0.032667607 1.0 -0.9620921
-1.0 -0.47338098 1.0 -0.9308803
rewards 0.9807056877136231
turbulence 16.739999771118164
trade: 3857
cost: 4164.348486604698
0.26865137 0.05989322 -1.0 0.93567324
-1.0 0.9539876 -1.0 0.958786
-1.0 -1.0 1.0 -0.11434269
-1.0 1.0 -1.0 0.989802
1.0 -1.0 1.0 0.71513724
-0.3455305 0.871813 -1.0 0.9951203
0.31858295 0.8202478 1.0 0.9939883
1.0 0.7287216 1.0 -0.9467261
1.0 0.026095442 1.0 -0.9411807
-1.0 0.019131586 -1.0 -0.53118974
1.0 0.7280693 1.0 0.68970335
-1.0 -0.8889825 -1.0 -0.9773715
-0.19180846 -1.0 1.0 0.3818587
1.0 1.0 1.0 -0.9843823
1.0 0.25449097 1.0 -0.9978017
1.0 0.043172166 1.0 0.49492717
1.0 -0.8034741 1.0 0.9891739
1.0 -0.2836809 1.0 0.96203315
1.0 -0.6825775 -1.0 -0.9736338
1.0 -0.4191214 -1.0 -0.94168836
1.0 0.4314394 -1.0 0.92723346
0.43017232 0.70252186 -1.0 0.9047724
-1.0 -1.0 -1.0 -0.9459439
1.0 -0.1833418 -1.0 0.9846077
-1.0 0.21126366 1.0 -0.6392057
1.0 0.81350034 -1.0 -0.81784046
1.0 1.0 1.0 0.95287585
-1.0 -0.45780364 1.0 -0.9891127
-1.0 -1.0 1.0 -0.9957022
rewards 0.15910173645019532
turbulence 16.760000228881836
```

```
trade: 3876
cost: 4164.348486604698
-1.0 -1.0 -1.0 0.96098685
-1.0 -1.0 -1.0 0.7030033
-1.0 -1.0 1.0 -0.13047016
-0.5350661 1.0 -1.0 0.986218
0.4837435 -0.20965682 1.0 0.99008083
-1.0 -1.0 -1.0 0.9682801
0.5723325 -1.0 1.0 0.9972923
1.0 -0.9474786 1.0 -0.7411678
-0.7571955 -1.0 1.0 -0.84668094
-1.0 1.0 -1.0 0.06391168
1.0 -0.18328354 1.0 0.86231136
-1.0 0.8824178 -1.0 -0.96973443
1.0 -1.0 1.0 0.7618425
1.0 1.0 1.0 -0.9879066
1.0 -0.7756077 1.0 -0.9858295
1.0 1.0 1.0 0.914726
1.0 -0.9309484 1.0 0.99208546
1.0 1.0 1.0 0.089769244
-1.0 -0.029938947 -1.0 -0.88678014
1.0 0.7257035 -1.0 -0.9705992
-1.0 1.0 -1.0 0.9899006
-0.65761065 1.0 -1.0 0.8710519
-1.0 -0.77785397 -1.0 -0.89731574
1.0 0.5540113 -1.0 0.9648633
1.0 1.0 1.0 -0.93544716
1.0 1.0 -1.0 -0.93222517
1.0 -1.0 1.0 0.92199016
0.8975752 0.5959734 1.0 -0.94974065
-1.0 0.5050081 1.0 -0.88806796
rewards 0.08558214365462773
turbulence 17.899999618530273
trade: 3894
cost: 4186.004463235863
-1.0 1.0 -1.0 0.8775115
-1.0 1.0 -1.0 0.79382
-1.0 -0.54219246 1.0 -0.73195326
-1.0 -0.3729335 -1.0 0.9510515
0.14977682 0.70477235 1.0 0.87094235
-0.07771146 0.8806917 -1.0 0.9900762
1.0 -1.0 1.0 0.9540657
0.6272189 -1.0 1.0 -0.79395103
-0.2836064 0.92767507 1.0 -0.86507297
-1.0 0.6801189 -1.0 -0.7593777
1.0 -1.0 1.0 0.93561816
-1.0 -0.923385 -1.0 -0.96840227
1.0 0.22812486 1.0 0.9777645
```

```
1.0 1.0 1.0 -0.9724942
1.0 -0.013173997 1.0 -0.9962083
1.0 1.0 1.0 0.9560096
1.0 1.0 1.0 0.994254
-0.64472175 1.0 1.0 0.90820575
-0.1183753 1.0 -1.0 -0.9662994
1.0 -1.0 -1.0 -0.869357
1.0 -0.8689244 -1.0 0.971395
-0.3605947 0.062062472 -1.0 0.9715289
-1.0 -0.32398495 -1.0 -0.92982274
1.0 -1.0 -1.0 0.98765564
0.31413922 1.0 1.0 -0.9342253
1.0 1.0 -1.0 -0.79818714
1.0 0.12773564 1.0 0.6898835
0.29898 0.14262666 1.0 -0.9843565
-1.0 -0.8097846 1.0 -0.98605746
rewards -0.1316537666320801
turbulence 17.479999542236328
trade: 3911
cost: 4186.004463235863
-1.0 -1.0 -1.0 0.8169627
-1.0 0.05977936 -1.0 0.58666706
-1.0 -1.0 1.0 -0.8175353
-1.0 1.0 -1.0 0.97799873
0.16218747 -0.63112134 1.0 0.9295224
-1.0 -0.3525475 -1.0 0.9154643
1.0 1.0 1.0 0.8335999
1.0 -1.0 1.0 -0.42616528
-1.0 1.0 1.0 -0.6350026
-1.0 0.1563772 -1.0 -0.615366
1.0 0.65244263 1.0 0.79533744
-1.0 0.4445195 -1.0 -0.9175759
1.0 1.0 1.0 0.9300338
1.0 0.26037422 1.0 -0.9388156
1.0 -0.9486508 1.0 -0.98421514
1.0 -1.0 1.0 0.31550956
1.0 -0.0041224062 1.0 0.9981508
-0.60625744 1.0 1.0 0.98903906
1.0 0.9098609 -1.0 -0.7695121
1.0 0.6118328 -1.0 -0.985566
-1.0 1.0 -1.0 0.91862214
1.0 -0.13562478 -1.0 0.9263878
-0.936303 -0.11681187 -1.0 -0.8340527
1.0 0.21646237 -1.0 0.91105413
-1.0 -0.94433475 1.0 -0.9268315
1.0 -1.0 -1.0 -0.78454465
1.0 -1.0 1.0 0.80522156
-0.12714094 -0.1741834 1.0 -0.946076
```

```
-1.0 -0.4894035 1.0 -0.9693154
rewards 0.1467128966690041
turbulence 18.040000915527344
trade: 3927
cost: 4193.908203760156
-0.6835475 1.0 -1.0 0.9094528
-1.0 -0.017968625 -1.0 0.45744753
-1.0 -1.0 1.0 -0.3637411
-1.0 -0.31771147 -1.0 0.95144284
1.0 -0.3823077 1.0 0.49642932
-1.0 -0.4320789 -1.0 0.997571
1.0 0.7785231 1.0 0.877504
1.0 -0.5312286 1.0 -0.320414
-1.0 -0.27574506 1.0 -0.9685395
-1.0 -0.5323862 -1.0 -0.07111049
1.0 -1.0 1.0 -0.9778724
-1.0 0.74469435 -1.0 -0.9775233
1.0 0.50761306 1.0 -0.29762763
1.0 -0.08352402 1.0 -0.9260719
1.0 0.51825947 1.0 -0.86715055
1.0 0.65279496 1.0 0.36490238
1.0 -0.51953584 1.0 0.9597906
1.0 1.0 1.0 0.9221616
1.0 -1.0 -1.0 -0.9221932
1.0 -1.0 -1.0 -0.90640724
-0.95685905 -1.0 -1.0 0.9840158
-0.13375878 -0.9011191 -1.0 0.9928322
-1.0 0.49383113 -1.0 -0.9908107
1.0 0.4230414 -1.0 0.9876126
-1.0 -1.0 1.0 -0.85013443
0.64280343 1.0 -1.0 -0.9461298
1.0 -0.58112085 1.0 0.8521011
-0.39395607 -0.6997017 1.0 -0.91438526
-1.0 -1.0 1.0 -0.981947
rewards 0.318503711558925
turbulence 16.420000076293945
trade: 3941
cost: 4221.249712133415
-0.8832084 0.9639262 -1.0 0.9730147
-1.0 1.0 -1.0 0.110224366
-1.0 -1.0 1.0 -0.40450656
-1.0 1.0 -1.0 0.9554646
-1.0 -0.46915537 1.0 0.99216175
-1.0 -0.23524728 -1.0 0.9814203
0.74245834 -0.13726002 1.0 0.48473585
1.0 0.1327366 1.0 -0.605876
0.6319818 1.0 1.0 -0.54152155
-0.09149408 1.0 -1.0 -0.5709864
```

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1.0 -1.0 1.0 -0.5158583
-1.0 0.48138422 -1.0 -0.955407
1.0 -1.0 1.0 0.391613
1.0 -1.0 1.0 -0.98130786
1.0 1.0 1.0 -0.9798465
1.0 1.0 1.0 0.8357003
1.0 1.0 1.0 0.9955821
1.0 -1.0 1.0 0.85442185
-0.9112389 0.6478469 -1.0 -0.9696914
1.0 -0.7388756 -1.0 -0.9598326
-0.20226184 -1.0 -1.0 0.98445725
1.0 0.7217089 -1.0 0.97724354
-1.0 1.0 -1.0 -0.984961
1.0 -0.09421864 -1.0 0.9832357
-0.5725694 0.52054244 1.0 -0.97376966
1.0 1.0 -1.0 -0.96263844
1.0 -0.91899633 1.0 0.51988125
1.0 1.0 1.0 -0.9571113
-0.9303564 -1.0 1.0 -0.9950558
rewards -0.9144249528160087
turbulence 16.420000076293945
trade: 3958
cost: 4234.516612424858
-0.7430515 -1.0 -1.0 0.9906695
-1.0 -1.0 -1.0 0.8212532
-1.0 -0.2840905 1.0 0.21527815
-0.8380544 -1.0 -1.0 0.96800494
0.98199785 -0.6088946 1.0 0.66642404
0.34064555 -1.0 -1.0 0.99139524
0.36068845 0.49474114 1.0 0.89657974
1.0 -1.0 1.0 -0.77776307
0.018943414 0.7587743 1.0 -0.88697314
-1.0 -1.0 -1.0 0.2888447
1.0 1.0 1.0 -0.8441752
-1.0 1.0 -1.0 -0.8926473
1.0 1.0 1.0 0.976357
1.0 1.0 1.0 -0.913235
1.0 -0.8024582 1.0 -0.95817333
1.0 1.0 1.0 0.8853016
0.6808971 -0.11758177 1.0 0.98644745
1.0 0.28602335 1.0 0.98670006
0.7214455 -0.23112537 -1.0 -0.98287994
1.0 1.0 -1.0 -0.9865352
1.0 -0.80638105 -1.0 0.99372864
0.320829 -1.0 -1.0 0.70381176
-1.0 -1.0 -1.0 -0.87489647
1.0 0.09532395 -1.0 0.98043025
-1.0 -1.0 1.0 -0.5613383
```

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1.0 -1.0 -1.0 -0.8604094
1.0 1.0 1.0 0.7950698
-1.0 1.0 1.0 -0.9671298
-0.39561462 1.0 1.0 -0.982303
rewards -0.2479753942386713
turbulence 17.06999969482422
trade: 3975
cost: 4242.236573488243
-1.0 0.9615561 -1.0 0.94793415
-1.0 -0.5224184 -1.0 0.6486956
-1.0 -0.5416064 1.0 -0.7375802
-1.0 0.3027546 -1.0 0.99688315
1.0 -1.0 1.0 0.728022
-1.0 -1.0 -1.0 0.93575644
1.0 -0.8830468 1.0 0.9931245
1.0 -0.06596613 1.0 -0.72981423
0.09163693 -0.877468 1.0 -0.9498612
-1.0 0.46294898 -1.0 -0.7168523
1.0 -1.0 1.0 -0.32570165
-1.0 1.0 -1.0 -0.8265674
1.0 1.0 1.0 0.4456873
1.0 0.13247828 1.0 -0.88382065
1.0 0.12857437 1.0 -0.976913
1.0 0.08976062 1.0 0.8804972
0.23365086 1.0 1.0 0.9951782
1.0 -0.8080139 1.0 0.96273637
-0.6826298 0.6414526 -1.0 -0.9592279
1.0 0.76486284 -1.0 -0.9238141
-1.0 -1.0 -1.0 0.95480585
-1.0 1.0 -1.0 0.9859705
-1.0 -1.0 -1.0 -0.91379285
1.0 1.0 -1.0 0.9580116
-0.5517279 -0.9879004 1.0 -0.82671887
1.0 -0.9698513 -1.0 -0.914259
1.0 0.43751734 1.0 0.9309411
0.16928342 0.2791314 1.0 -0.9831498
-1.0 0.17339706 1.0 -0.99651295
rewards -1.4053970046566102
turbulence 17.889999389648438
trade: 3991
cost: 4264.620819883355
0.505177 -0.24085939 -1.0 0.8746228
-1.0 0.07638323 -1.0 0.8692832
-0.66077733 -1.0 1.0 -0.17171276
-1.0 1.0 -1.0 0.78742576
-0.015657322 0.6283494 1.0 0.96211696
-1.0 -0.47677702 -1.0 0.8673613
1.0 1.0 1.0 0.788466
```

```
0.11119497 -1.0 1.0 -0.5910024
0.043168835 1.0 1.0 -0.63462937
-1.0 -0.9135614 -1.0 0.29289532
1.0 1.0 1.0 -0.9356713
-1.0 0.7433959 -1.0 -0.95871437
1.0 -0.46303645 1.0 -0.44654262
1.0 0.36484855 1.0 -0.9769235
1.0 -0.7405833 1.0 -0.97867763
1.0 1.0 1.0 0.95129144
1.0 1.0 1.0 0.9782698
0.6544142 0.4024058 1.0 0.9408777
1.0 1.0 -1.0 -0.802671
1.0 -1.0 -1.0 -0.772709
0.7682919 0.9145846 -1.0 0.88926077
1.0 0.5724016 -1.0 0.98143506
-1.0 1.0 -1.0 -0.85952324
1.0 -0.39493796 -1.0 0.95198584
-1.0 0.25381592 1.0 -0.86129224
1.0 -0.4732115 -1.0 -0.88523316
1.0 0.49960345 1.0 0.53634477
-0.90167767 -0.88145554 1.0 -0.86349994
-1.0 -1.0 1.0 -0.99046004
rewards -0.7374330932617188
turbulence 16.100000381469727
trade: 4006
cost: 4264.620819883355
-1.0 -0.44832772 -1.0 0.96972036
-0.44927323 1.0 -1.0 0.560053
-1.0 -1.0 1.0 -0.75058126
-1.0 -1.0 -1.0 0.981303
0.9642492 -1.0 1.0 0.5353695
-1.0 -1.0 -1.0 0.9810746
-0.14292502 -0.23840886 1.0 0.7185929
1.0 0.503647 1.0 -0.26805556
-1.0 0.1666239 1.0 -0.13714373
-1.0 -0.51019335 -1.0 -0.85772955
1.0 0.561553 1.0 0.15768456
-1.0 -1.0 -1.0 -0.85367346
1.0 1.0 1.0 0.8389517
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1.0 0.5125509 1.0 0.9421692
0.7688765 -1.0 1.0 0.9610336
1.0 0.2596671 1.0 0.88157296
-0.124112844 1.0 -1.0 -0.9111113
1.0 0.20629261 -1.0 -0.9802582
0.8143916 -0.3770886 -1.0 0.9849224
1.0 -1.0 -1.0 0.99501586
```

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-1.0 -0.6526259 -1.0 -0.9806288
1.0 1.0 -1.0 0.98414266
-1.0 -1.0 1.0 -0.80262417
1.0 1.0 -1.0 -0.69326043
1.0 0.049627215 1.0 0.77682424
-1.0 -0.033441067 1.0 -0.9851676
-0.5761436 0.22183153 1.0 -0.7541075
rewards -0.03298769834325649
turbulence 15.649999618530272
trade: 4022
cost: 4283.736713991174
-0.33463 0.113556504 -1.0 0.9556382
-1.0 -0.42576575 -1.0 0.6462734
-1.0 0.45097318 1.0 -0.89187443
-1.0 -1.0 -1.0 0.95505476
-1.0 -1.0 1.0 0.97095454
-1.0 -0.41927502 -1.0 0.9598166
1.0 1.0 1.0 0.9372301
1.0 0.087985754 1.0 -0.9837201
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-1.0 -1.0 -1.0 -0.924707
1.0 -1.0 1.0 0.4029776
-1.0 -1.0 -1.0 -0.9112772
0.5787562 1.0 1.0 -0.4369825
1.0 -1.0 1.0 -0.841395
1.0 -1.0 1.0 -0.98518455
1.0 1.0 1.0 0.7953167
0.5565575 -0.44292885 1.0 0.9726875
1.0 0.40822345 1.0 0.4780978
1.0 0.8734809 -1.0 -0.9607212
1.0 0.47756276 -1.0 -0.5942445
1.0 -0.3614674 -1.0 0.9690423
-0.16070637 0.14439806 -1.0 0.97038317
-0.9294138 1.0 -1.0 -0.64351773
1.0 -0.6901077 -1.0 0.97574615
-1.0 -0.80113244 1.0 -0.94973004
1.0 0.23419316 -1.0 -0.97166854
1.0 0.24862891 1.0 0.81433594
-1.0 -0.79773617 1.0 -0.89077055
-1.0 -1.0 1.0 -0.9132928
rewards -0.6544142240764806
turbulence 16.389999389648438
trade: 4037
cost: 4290.780188428888
-1.0 -1.0 -1.0 0.8988495
-1.0 1.0 -1.0 0.6047747
-1.0 -0.5894578 1.0 -0.32221514
-1.0 0.9834003 -1.0 0.99034643
```

```
-1.0 0.79058737 1.0 0.95526385
-0.31346405 1.0 -1.0 0.9675267
0.39297426 0.6529323 1.0 0.4605676
1.0 0.07595119 1.0 -0.59413016
1.0 -1.0 1.0 -0.19566971
-1.0 -0.05561702 -1.0 -0.02489239
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-1.0 1.0 -1.0 -0.886137
0.84776336 1.0 1.0 0.13782382
1.0 -0.5176244 1.0 -0.9051258
1.0 -0.5610594 1.0 -0.8853768
0.73658025 0.5048286 1.0 0.80275524
1.0 -0.8861097 1.0 0.99734116
1.0 -0.24556261 1.0 0.98083115
1.0 -1.0 -1.0 -0.85977614
1.0 -0.6421684 -1.0 -0.94789237
-0.057573184 -0.9754527 -1.0 0.9898391
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-1.0 1.0 -1.0 -0.55085796
1.0 -0.2844462 -1.0 0.9833653
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1.0 -1.0 -1.0 -0.8811569
1.0 -0.6867701 1.0 0.8259058
-0.24996002 1.0 1.0 -0.73582923
-1.0 -1.0 1.0 -0.9649232
rewards -0.0077414753372082494
turbulence 17.020000457763672
trade: 4052
cost: 4318.166438383112
1.0 0.74446404 -1.0 0.78609705
-1.0 0.60901093 -1.0 0.9596379
-1.0 -0.14818394 1.0 -0.8891047
-1.0 -1.0 -1.0 0.95219016
0.10609643 -1.0 1.0 0.9790969
-0.35698295 0.12317097 -1.0 0.97195435
1.0 0.9816753 1.0 0.9531226
1.0 -0.8775568 1.0 0.4263811
1.0 0.6897497 1.0 -0.7752254
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1.0 0.82622916 1.0 0.78481054
-1.0 -1.0 -1.0 -0.7946789
-1.0 -1.0 1.0 -0.765382
1.0 0.3548274 1.0 -0.95417297
1.0 1.0 1.0 -0.9594876
1.0 1.0 1.0 0.84772563
0.60683084 1.0 1.0 0.9413979
1.0 -1.0 1.0 0.8112829
0.9641577 0.34144124 -1.0 -0.9880301
```

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1.0 -0.5344038 -1.0 -0.9851284
1.0 1.0 -1.0 0.96699905
0.3069575 -1.0 -1.0 0.84086514
-1.0 -1.0 -1.0 -0.95273036
1.0 -0.58902144 -1.0 0.99253535
-1.0 -0.5902996 1.0 -0.90984696
1.0 -0.75202316 -1.0 -0.96959543
1.0 -0.43992403 1.0 0.8944528
-0.7681575 1.0 1.0 -0.9437381
-1.0 1.0 1.0 -0.99789566
rewards -0.9427693295105128
turbulence 18.149999618530277
trade: 4070
cost: 4332.917549039851
-1.0 -0.35377565 -1.0 0.6779889
-1.0 1.0 -1.0 0.6248932
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-1.0 -1.0 -1.0 0.97322786
0.8583743 -0.5049751 1.0 0.98073006
-1.0 1.0 -1.0 0.9975815
1.0 -1.0 1.0 0.97927594
1.0 -0.12782435 1.0 -0.7978965
0.5816399 -0.13243882 1.0 -0.98149407
-1.0 -0.50748706 -1.0 -0.68034184
1.0 1.0 1.0 -0.98835063
-1.0 0.43035156 -1.0 -0.92870563
1.0 1.0 1.0 0.50754476
1.0 0.032159954 1.0 -0.9032677
1.0 1.0 1.0 -0.95609397
1.0 1.0 1.0 -0.14816046
0.40841573 -0.26496896 1.0 0.9304199
1.0 1.0 1.0 0.9216002
1.0 0.12090655 -1.0 -0.9560804
1.0 0.40607008 -1.0 -0.9005758
-0.6510986 -0.46583915 -1.0 0.98400116
-0.19754425 -0.40281662 -1.0 0.9427533
-1.0 -0.45461288 -1.0 -0.9276538
1.0 1.0 -1.0 0.95115554
-1.0 -0.18440215 1.0 -0.8562954
1.0 -1.0 -1.0 -0.8562568
1.0 0.02772817 1.0 0.69169855
-0.38418168 0.40875357 1.0 -0.93056744
-1.0 -1.0 1.0 -0.8617865
rewards -2.1560198112315967
turbulence 17.75
trade: 4087
cost: 4360.008487436306
-0.07717657 0.9362238 -1.0 0.96857643
```

```
1.0 -1.0 -1.0 0.4150585
-1.0 0.24825633 1.0 -0.5921021
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-1.0 -0.20907533 -1.0 0.98244905
1.0 1.0 1.0 0.9914695
1.0 -0.63689524 1.0 0.21226919
-0.78619075 -1.0 1.0 -0.97562486
-1.0 -0.51632047 -1.0 -0.5845645
1.0 1.0 1.0 -0.94251096
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0.30126202 0.16406092 1.0 -0.05438924
1.0 -1.0 1.0 -0.97079676
1.0 -0.5007412 1.0 -0.972716
1.0 -0.27943966 1.0 0.7825589
1.0 -0.28585157 1.0 0.97476125
0.774268 -1.0 1.0 0.92112947
1.0 0.8005441 -1.0 -0.99291134
1.0 -1.0 -1.0 -0.90815735
1.0 -0.5748986 -1.0 0.9820471
-1.0 0.41382992 -1.0 0.8852377
-1.0 -1.0 -1.0 -0.88248885
1.0 -0.3174593 -1.0 0.99819124
-0.99778116 -0.5247922 1.0 -0.90421647
1.0 0.5787622 -1.0 -0.9802191
1.0 -0.5442991 1.0 0.93463755
0.87853646 -0.8288315 1.0 -0.9155917
-1.0 -0.9001282 1.0 -0.99392307
rewards -2.178080736843869
turbulence 20.700000762939453
trade: 4103
cost: 4365.704749002467
-0.72700864 -0.12438694 -1.0 0.9872174
-1.0 -1.0 -1.0 0.89677167
-1.0 0.7601648 1.0 -0.89058053
-1.0 1.0 -1.0 0.99367523
0.93317586 -1.0 1.0 0.8552301
-1.0 0.91340095 -1.0 0.5907872
1.0 0.699332 1.0 0.9976251
0.6405926 -1.0 1.0 -0.818366
0.13962899 -1.0 1.0 -0.9463341
-1.0 1.0 -1.0 -0.7351297
1.0 1.0 1.0 0.39064014
-1.0 0.24992302 -1.0 -0.9109508
1.0 1.0 1.0 -0.8296042
1.0 1.0 1.0 -0.9694855
1.0 -1.0 1.0 -0.99851304
1.0 -0.6317277 1.0 0.87325716
```

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1.0 0.08911613 1.0 0.79313695
1.0 -0.454108 1.0 0.99544
1.0 -1.0 -1.0 -0.93462193
1.0 0.021738112 -1.0 -0.8161032
0.19375843 -1.0 -1.0 0.9455668
0.8162622 -1.0 -1.0 0.98049116
-1.0 0.45254228 -1.0 -0.63681144
1.0 1.0 -1.0 0.5858389
-0.7307349 0.75708187 1.0 -0.85963583
0.5997286 -1.0 -1.0 -0.9280253
1.0 -1.0 1.0 0.65828633
-1.0 0.063919574 1.0 -0.97223353
-1.0 0.20800874 1.0 -0.9983993
rewards 2.5807972776592245
turbulence 17.889999389648438
trade: 4118
cost: 4367.73614568902
1.0 1.0 -1.0 0.6420157
-1.0 0.9443317 -1.0 0.8679135
-1.0 -0.5327895 1.0 -0.4472152
-1.0 -1.0 -1.0 0.9555292
-1.0 -1.0 1.0 0.9347944
-1.0 1.0 -1.0 0.96192837
1.0 0.35755458 1.0 0.9497987
0.21763122 0.79687935 1.0 -0.6270174
0.21841168 0.09389695 1.0 -0.33420223
-1.0 0.08853592 -1.0 0.14858317
1.0 0.20481831 1.0 -0.7481456
-1.0 -1.0 -1.0 -0.98130554
1.0 -0.23290932 1.0 0.4812392
1.0 0.40431923 1.0 -0.9698039
1.0 0.6292058 1.0 -0.97089034
1.0 0.95320994 1.0 0.6402068
1.0 -0.60496455 1.0 0.92839813
1.0 -0.05913675 1.0 0.99025595
1.0 0.1132085 -1.0 -0.8760377
1.0 0.2827419 -1.0 -0.86601806
-0.17215204 0.5157802 -1.0 0.99374104
-0.4045985 0.0045896694 -1.0 0.77365196
-1.0 -0.59733623 -1.0 -0.63950384
1.0 -1.0 -1.0 0.96537817
-0.7186267 0.6103394 1.0 -0.77561533
1.0 -1.0 -1.0 -0.96560055
1.0 -0.8336298 1.0 0.65791905
1.0 0.44743347 1.0 -0.9784358
-0.7422663 1.0 1.0 -0.9943154
rewards 0.4956881886886433
turbulence 16.65999984741211
```

```
trade: 4139
cost: 4369.724963453302
-1.0 1.0 -1.0 0.9304712
-1.0 -0.82147706 -1.0 0.84890866
-1.0 1.0 1.0 -0.78673816
-1.0 -1.0 -1.0 0.991817
-0.88236314 -0.070952326 1.0 0.9595567
-1.0 1.0 -1.0 0.93975973
0.889029 0.5808848 1.0 0.70584977
1.0 -0.31763136 1.0 0.42186642
-0.36464489 -0.97265905 1.0 -0.7440721
-1.0 -0.2857307 -1.0 -0.20777285
1.0 -0.11306664 1.0 -0.9490293
-1.0 0.48633778 -1.0 -0.9542165
-0.5004724 -0.22120932 1.0 0.12006664
1.0 -0.56785357 1.0 -0.9934275
1.0 0.8388684 1.0 -0.9906745
1.0 0.0371266 1.0 0.9407338
0.2622376 -1.0 1.0 0.9767797
0.22725499 -0.791004 1.0 0.992512
0.3486377 0.72374713 -1.0 -0.9679499
1.0 -1.0 -1.0 -0.9457302
1.0 -1.0 -1.0 0.79821086
-1.0 -0.5329615 -1.0 0.5673435
-1.0 -0.3347316 -1.0 -0.92534566
1.0 -1.0 -1.0 0.9916425
0.519201 0.2325446 1.0 -0.90914184
1.0 0.59409124 -1.0 -0.86430496
1.0 -1.0 1.0 0.19465983
-1.0 0.6429385 1.0 -0.96991706
-1.0 -1.0 1.0 -0.99520177
rewards -0.08393616092910525
turbulence 16.31999969482422
trade: 4156
cost: 4374.9419804592235
-1.0 0.2730791 -1.0 0.99940705
-1.0 -1.0 -1.0 0.73278606
-0.7264105 -0.7178495 1.0 0.36157012
-1.0 1.0 -1.0 0.98901176
-1.0 -0.8879703 1.0 0.9379355
-1.0 0.85000163 -1.0 0.99728465
1.0 -0.17239293 1.0 0.94656634
1.0 0.73297983 1.0 -0.23140061
-0.37873983 1.0 1.0 -0.87340367
-1.0 0.016164333 -1.0 -0.019665241
1.0 1.0 1.0 -0.63895965
-1.0 -1.0 -1.0 -0.98064727
1.0 -1.0 1.0 0.7423918
```

```
1.0 1.0 1.0 -0.99070036
1.0 0.23942868 1.0 -0.9929717
1.0 0.5917412 1.0 0.9429374
1.0 0.8767189 1.0 0.9964615
1.0 0.22673473 1.0 0.99648464
-0.21697438 -0.44281787 -1.0 -0.87619185
1.0 -0.6631216 -1.0 -0.9508974
-1.0 -0.36877233 -1.0 0.97275627
-1.0 -1.0 -1.0 0.66358006
-1.0 -0.19656603 -1.0 -0.9136609
1.0 -0.62441516 -1.0 0.98695445
0.65019983 0.5835581 1.0 -0.55473137
1.0 -1.0 -1.0 -0.92603266
1.0 -0.38715395 1.0 0.5240233
0.32863095 -0.40945023 1.0 -0.9983209
-1.0 0.3888247 1.0 -0.978332
rewards 1.4610406187789982
turbulence 15.970000267028809
trade: 4175
cost: 4390.542071661006
0.24597895 -1.0 -1.0 0.9897392
-1.0 -0.2985882 -1.0 0.83472407
-1.0 -0.04033804 1.0 -0.91521835
-1.0 -1.0 -1.0 0.9825567
1.0 0.87954247 1.0 0.92032766
-1.0 1.0 -1.0 0.9865129
0.6424136 1.0 1.0 0.83696723
0.962181 -0.8552689 1.0 -0.7554808
0.46862024 -0.7631207 1.0 -0.95435494
-1.0 0.5866565 -1.0 -0.64081526
1.0 0.0002457127 1.0 0.086277485
-1.0 1.0 -1.0 -0.97033715
1.0 1.0 1.0 0.6129602
1.0 0.89288443 1.0 -0.9901022
1.0 1.0 1.0 -0.93354553
1.0 0.5576295 1.0 0.82675385
0.8600625 0.022117019 1.0 0.78795505
1.0 -0.053938508 1.0 0.8816514
1.0 -0.11557096 -1.0 -0.99092716
1.0 -1.0 -1.0 -0.95128
-0.05281982 1.0 -1.0 0.98907995
-0.068809316 1.0 -1.0 0.9581983
-1.0 -0.5185701 -1.0 -0.9283218
1.0 0.67831993 -1.0 0.9565482
-1.0 0.29647377 1.0 -0.6054607
1.0 0.31019518 -1.0 -0.7783547
1.0 -0.73473734 1.0 0.70497894
-0.25762883 1.0 1.0 -0.98580706
```

```
-1.0 -0.2424601 1.0 -0.89975446
rewards 3.061836610412598
turbulence 15.619999885559082
trade: 4190
cost: 4390.542071661006
-0.86454797 -1.0 -1.0 0.77420735
-1.0 1.0 -1.0 0.9171243
-1.0 -0.87636 1.0 0.52004445
-0.9781755 -0.19086196 -1.0 0.98484087
-1.0 0.50267476 1.0 0.9034369
-1.0 0.71346784 -1.0 0.9569142
0.5686008 0.3671548 1.0 0.9751942
0.05583477 -0.09821544 1.0 -0.7355288
0.055070203 0.12747264 1.0 -0.9684888
-1.0 0.9441748 -1.0 0.20222759
1.0 0.06171834 1.0 0.3112309
-1.0 -1.0 -1.0 -0.9944207
1.0 1.0 1.0 -0.7017754
1.0 0.6391242 1.0 -0.9737862
1.0 0.12606578 1.0 -0.9790689
1.0 1.0 1.0 0.9089148
1.0 -0.59594744 1.0 0.94760466
1.0 0.9685535 1.0 0.9710417
1.0 -0.98062545 -1.0 -0.97350734
1.0 0.61226773 -1.0 -0.8565209
1.0 -0.12068086 -1.0 0.89496946
-0.68723255 0.17096289 -1.0 0.9696177
-1.0 0.06728056 -1.0 -0.81245136
1.0 0.1182729 -1.0 0.93198586
-1.0 0.85076255 1.0 -0.6444633
1.0 -0.9192565 -1.0 -0.96670467
1.0 1.0 1.0 0.47616744
-0.32270503 -0.90177727 1.0 -0.9854937
-1.0 -0.53559566 1.0 -0.9964493
rewards -0.7401486333908048
turbulence 15.760000228881836
trade: 4209
cost: 4398.13374461938
0.73237956 -1.0 -1.0 0.4318124
-1.0 0.13346055 -1.0 0.8057556
-1.0 0.6200619 1.0 -0.8922648
-1.0 -1.0 -1.0 0.99329233
1.0 1.0 1.0 0.93167865
0.3530724 -0.4749869 -1.0 0.9843782
0.54480314 0.11448434 1.0 0.9824383
1.0 -1.0 1.0 -0.9051528
1.0 -1.0 1.0 -0.9281046
-1.0 -1.0 -1.0 0.08385694
```

```
1.0 -0.5585492 1.0 -0.4753483
-1.0 -0.09238163 -1.0 -0.9937623
1.0 -1.0 1.0 -0.94472116
1.0 0.70485544 1.0 -0.95263195
1.0 -1.0 1.0 -0.9846581
1.0 1.0 1.0 0.7315141
0.29553837 0.7660745 1.0 0.9947059
1.0 -0.6362318 1.0 0.89816153
1.0 0.5283621 -1.0 -0.97988194
1.0 -1.0 -1.0 -0.9011008
-0.039047003 0.3182513 -1.0 0.9023609
1.0 -0.90135854 -1.0 0.54391813
-1.0 -0.6584121 -1.0 -0.8699539
1.0 0.1414119 -1.0 0.9719553
1.0 -0.96602035 1.0 -0.93835944
1.0 0.92824584 -1.0 -0.94203883
1.0 -1.0 1.0 0.5345812
0.13951702 1.0 1.0 -0.996652
-1.0 0.15438268 1.0 -0.98140347
rewards 0.5703418785095216
turbulence 16.020000457763672
trade: 4223
cost: 4398.13374461938
0.60878193 -0.8082891 -1.0 0.9500425
-1.0 -0.38875735 -1.0 0.7924392
-0.40729833 -0.9643221 1.0 -0.9745289
-1.0 -0.42860135 -1.0 0.9864366
-1.0 0.6410678 1.0 0.9586369
-0.81950223 -0.18070042 -1.0 0.9979764
1.0 -1.0 1.0 0.4421891
1.0 -0.18449517 1.0 -0.8826955
0.11122712 -1.0 1.0 -0.93992424
-1.0 -1.0 -1.0 -0.028509438
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-1.0 0.06633846 -1.0 -0.9935617
1.0 0.061439183 1.0 -0.38927388
1.0 1.0 1.0 -0.97117937
1.0 0.16467012 1.0 -0.9963716
1.0 1.0 1.0 0.9522283
1.0 -0.40099072 1.0 0.9780531
0.7287679 0.4449849 1.0 0.87882066
1.0 0.6029274 -1.0 -0.846047
1.0 0.08844216 -1.0 -0.9140204
1.0 1.0 -1.0 0.8527069
-0.5780724 -0.42826986 -1.0 0.9737351
-1.0 -0.6709902 -1.0 -0.950603
1.0 1.0 -1.0 0.85930896
-0.19250962 -0.4473674 1.0 -0.85146284
```

```
1.0 0.234703 -1.0 -0.9346008
1.0 0.008669436 1.0 0.84905255
-1.0 0.55636436 1.0 -0.86849326
-1.0 -0.7973094 1.0 -0.9965557
rewards 0.18010164102516138
turbulence 15.829999923706056
trade: 4237
cost: 4407.646890642178
-1.0 -0.13055255 -1.0 0.9759946
0.5593436 -1.0 -1.0 0.9516425
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-0.9009284 0.04738608 -1.0 0.9951432
-1.0 0.27188286 1.0 0.99338984
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1.0 1.0 1.0 0.1131866
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1.0 1.0 1.0 0.21782339
-1.0 1.0 -1.0 -0.9745178
1.0 1.0 1.0 0.14269412
1.0 0.77320325 1.0 -0.97067904
1.0 0.4090156 1.0 -0.9953726
1.0 0.33800918 1.0 0.88939834
1.0 0.9617782 1.0 0.8870052
1.0 0.94382906 1.0 0.9956279
1.0 -0.6099669 -1.0 -0.80168575
1.0 1.0 -1.0 -0.8900172
-0.6278384 0.010032073 -1.0 0.98087764
-1.0 -0.7091226 -1.0 0.9629526
-1.0 1.0 -1.0 -0.69932497
1.0 1.0 -1.0 0.98175097
0.81662625 -1.0 1.0 -0.96890616
1.0 -0.65292245 -1.0 -0.95470387
1.0 -0.48843002 1.0 0.8979806
-0.30443814 0.010081917 1.0 -0.9549437
-1.0 -1.0 1.0 -0.9683204
rewards 1.3025470406017268
turbulence 15.479999542236328
trade: 4255
cost: 4422.414948980343
-0.39421046 0.14055908 -1.0 0.99475396
-1.0 -1.0 -1.0 0.7195685
-1.0 1.0 1.0 -0.9027801
-0.80535626 1.0 -1.0 0.96977925
1.0 1.0 1.0 0.9857973
-1.0 0.5017349 -1.0 0.9943011
1.0 0.9016678 1.0 0.88142955
```

```
1.0 -0.383296 1.0 -0.39772022
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-1.0 1.0 -1.0 -0.5544956
1.0 -0.63822377 1.0 0.25792646
-0.7850468 -0.64209795 -1.0 -0.7660973
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1.0 0.5906045 1.0 -0.96637046
1.0 -0.62770075 1.0 -0.9734777
1.0 1.0 1.0 0.946043
1.0 -0.6298988 1.0 0.8934022
-0.1902057 1.0 1.0 0.99737
0.75593114 0.07965032 -1.0 -0.96252114
1.0 1.0 -1.0 -0.9629799
0.6614678 -0.9846463 -1.0 0.8876333
0.66492474 0.6497845 -1.0 0.99838614
-1.0 -1.0 -1.0 -0.72075176
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1.0 -0.22214274 -1.0 -0.92787766
1.0 0.696999 1.0 0.7783582
0.49632922 -0.19131586 1.0 -0.99556947
-1.0 -0.5595045 1.0 -0.99508643
rewards 0.7410830234527588
turbulence 15.06999969482422
trade: 4269
cost: 4422.414948980343
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-1.0 -0.47746813 -1.0 0.9880147
-1.0 -0.37910998 1.0 0.74542856
-1.0 -0.00096848607 -1.0 0.9617777
1.0 1.0 1.0 0.7355766
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1.0 1.0 1.0 -0.28527826
-1.0 1.0 -1.0 -0.9335453
1.0 0.9044549 1.0 -0.37935233
1.0 -0.20133784 1.0 -0.9872984
1.0 0.6228465 1.0 -0.99131155
1.0 -0.61243093 1.0 0.7695111
1.0 1.0 1.0 0.9710003
1.0 0.3527708 1.0 0.99071
1.0 0.58110446 -1.0 -0.9295846
1.0 0.5516467 -1.0 -0.93152213
0.77870953 -0.44183877 -1.0 0.9378059
-1.0 1.0 -1.0 0.8555815
```

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-1.0 -0.8706081 -1.0 -0.874995
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-1.0 1.0 1.0 -0.98032874
1.0 0.9774413 -1.0 -0.9060167
1.0 -1.0 1.0 0.7267518
1.0 1.0 1.0 -0.9798853
-1.0 -1.0 1.0 -0.9957366
rewards -0.6848899396766676
turbulence 16.440000534057617
trade: 4287
cost: 4437.473082929621
-0.20949209 -1.0 -1.0 0.9803307
-1.0 0.64428335 -1.0 0.90551424
-1.0 -0.11958465 1.0 -0.7386685
0.4205699 -1.0 -1.0 0.97134626
-0.61342835 0.22251928 1.0 0.99662924
-0.8588221 0.08035171 -1.0 0.38258624
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1.0 -0.25336933 1.0 -0.9299431
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-1.0 0.79371333 -1.0 -0.609421
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-0.41886377 -0.045537606 -1.0 -0.9681027
1.0 1.0 1.0 0.81215
1.0 -0.03174147 1.0 -0.9881871
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1.0 0.4824906 1.0 0.9085901
1.0 -1.0 1.0 0.973408
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-0.9101558 0.43100736 -1.0 0.72396064
-1.0 0.44015205 -1.0 -0.7325742
1.0 0.10502902 -1.0 0.9802413
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1.0 0.6565651 -1.0 -0.9002947
1.0 0.9943476 1.0 -0.23106503
0.5627292 -1.0 1.0 -0.9814609
-1.0 1.0 1.0 -0.979423
rewards 0.8624975326705957
turbulence 16.200000762939453
trade: 4302
cost: 4459.197688322078
-1.0 0.3248108 -1.0 0.92352223
-1.0 -0.358993 -1.0 0.9411764
-0.8897702 1.0 1.0 -0.43013036
-1.0 1.0 -1.0 0.9823022
```

```
1.0 1.0 1.0 0.99546766
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1.0 1.0 1.0 -0.9872348
1.0 1.0 1.0 0.8988321
1.0 -1.0 1.0 0.9956424
1.0 -1.0 1.0 0.86165416
1.0 0.8195331 -1.0 -0.8288329
1.0 0.5943012 -1.0 -0.9756721
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-1.0 0.60571605 -1.0 0.98438
-1.0 0.38796988 -1.0 -0.96899295
1.0 -1.0 -1.0 0.7223166
0.4049682 -1.0 1.0 -0.9428988
1.0 1.0 -1.0 -0.9536018
1.0 -0.6964787 1.0 0.81126726
-1.0 0.5171299 1.0 -0.85803676
-1.0 -1.0 1.0 -0.93739384
rewards -1.7549625185859623
turbulence 19.0
trade: 4317
cost: 4474.001314275752
-0.65293777 -0.43513522 -1.0 0.9499686
-0.8216504 -0.46035933 -1.0 0.67320025
-1.0 0.44510728 1.0 -0.2459721
-1.0 -1.0 -1.0 0.9837719
-1.0 1.0 1.0 0.8427386
0.05696416 -0.6922097 -1.0 0.99395156
-0.52564037 1.0 1.0 0.86183405
0.5099515 -0.56994224 1.0 -0.1737107
-1.0 -0.07387391 1.0 -0.9757969
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1.0 -1.0 1.0 -0.38296342
-1.0 0.97125554 -1.0 -0.950791
1.0 1.0 1.0 0.76374876
1.0 0.11342323 1.0 -0.9846213
1.0 1.0 1.0 -0.9606526
1.0 0.6913513 1.0 0.92868185
0.8434213 0.926446 1.0 0.9830189
0.5562419 1.0 1.0 0.988292
-0.5057479 0.5779761 -1.0 -0.9824995
```

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1.0 1.0 -1.0 -0.98374844
1.0 -1.0 -1.0 0.98483765
0.55373216 -1.0 -1.0 0.9632945
-1.0 0.7257165 -1.0 -0.7596693
1.0 -0.58899206 -1.0 0.9858372
0.95367694 0.19114915 1.0 -0.9861395
1.0 -1.0 -1.0 -0.78649175
1.0 0.3005729 1.0 0.5556594
0.9648607 -1.0 1.0 -0.8361723
-1.0 -1.0 1.0 -0.9917141
rewards 2.600737270915974
turbulence 16.18000030517578
trade: 4333
cost: 4492.420116651544
-1.0 -1.0 -1.0 0.9942316
-1.0 -0.7206788 -1.0 0.9603207
-1.0 1.0 1.0 -0.8501145
-1.0 0.15322533 -1.0 0.9970343
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-1.0 1.0 -1.0 0.95122695
1.0 1.0 1.0 0.7281445
1.0 -1.0 1.0 -0.8867769
0.3539483 -1.0 1.0 -0.8862214
-1.0 -0.99527264 -1.0 -0.48620093
1.0 0.11060343 1.0 -0.9666504
-1.0 -1.0 -1.0 -0.98884743
1.0 0.32726523 1.0 0.96931005
1.0 -0.589244 1.0 -0.966704
1.0 0.7313049 1.0 -0.99684554
1.0 1.0 1.0 0.9454074
1.0 -0.30431753 1.0 0.9939711
1.0 1.0 1.0 0.99508643
1.0 0.037179768 -1.0 -0.99691
1.0 0.12690029 -1.0 -0.9790365
0.54941756 1.0 -1.0 0.90850806
0.14737293 -1.0 -1.0 0.9907222
-1.0 1.0 -1.0 -0.5587617
1.0 -1.0 -1.0 0.97501516
-0.32513148 -0.12883492 1.0 -0.7371942
1.0 0.54390717 -1.0 -0.92867756
1.0 0.53432584 1.0 0.7250651
-0.90762156 -0.70239216 1.0 -0.9932604
-1.0 0.12479791 1.0 -0.8930909
rewards 0.4608757524791872
turbulence 16.170000076293945
trade: 4349
cost: 4501.13248245431
-0.33456242 -0.7823663 -1.0 0.96062803
```

```
-0.94043016 1.0 -1.0 0.77842593
-1.0 0.72968477 1.0 -0.3982265
-1.0 -0.38084757 -1.0 0.97981656
-1.0 -0.991112 1.0 0.95564675
-0.5386559 -0.35668677 -1.0 0.4696343
1.0 -0.21263394 1.0 0.9687526
1.0 -0.24155055 1.0 -0.7763755
0.8191499 -0.48270673 1.0 -0.98086774
-1.0 -0.6084011 -1.0 0.49220395
1.0 -0.43170375 1.0 0.11447632
-1.0 -0.79946095 -1.0 -0.98258495
1.0 -0.033484675 1.0 -0.019794464
1.0 -0.5124861 1.0 -0.99362856
1.0 -1.0 1.0 -0.97882265
1.0 -0.43304533 1.0 0.9646125
0.40409607 -0.12992531 1.0 0.96882427
0.82086056 -0.9357034 1.0 0.82098794
0.7429418 -0.34109277 -1.0 -0.8046261
1.0 0.113949865 -1.0 -0.97554713
-0.17830963 -0.7359494 -1.0 0.99787474
0.118026435 1.0 -1.0 0.8160186
-1.0 -0.7814462 -1.0 -0.7095201
1.0 1.0 -1.0 0.99769163
-0.020514011 -0.04044375 1.0 -0.95202
1.0 -0.66735 -1.0 -0.81297535
1.0 -1.0 1.0 0.74987066
1.0 0.548646 1.0 -0.9246198
-1.0 -1.0 1.0 -0.992799
rewards -0.5519361598388758
turbulence 17.1200008392334
trade: 4364
cost: 4532.257615388881
-0.4090463 -0.68502605 -1.0 0.9325824
-1.0 1.0 -1.0 0.68990207
-1.0 0.89832944 1.0 0.2599721
-0.69348085 -0.9508699 -1.0 0.9936843
-1.0 0.38915944 1.0 0.8896476
-1.0 1.0 -1.0 0.9729184
-0.209589 1.0 1.0 0.91310716
0.71658814 1.0 1.0 -0.70328104
-1.0 0.5449978 1.0 -0.648682
-1.0 -0.09188076 -1.0 0.019601941
1.0 -1.0 1.0 0.851398
-0.9215951 -1.0 -1.0 -0.94556046
0.6322538 -0.2305705 1.0 0.81500196
1.0 1.0 1.0 -0.99263686
1.0 -1.0 1.0 -0.9595561
1.0 -1.0 1.0 0.8828486
```

```
-0.9522016 1.0 1.0 0.9963212
-0.10890436 -0.07064754 1.0 0.98981285
-0.68803096 -0.054761693 -1.0 -0.9766177
1.0 -0.8281493 -1.0 -0.96747124
1.0 1.0 -1.0 0.9950986
0.015440151 -1.0 -1.0 0.9943404
-1.0 -1.0 -1.0 -0.4925655
1.0 1.0 -1.0 0.9864105
0.206837 1.0 1.0 -0.9343646
1.0 1.0 -1.0 -0.7543373
1.0 0.31145272 1.0 0.32828796
-0.4736458 0.80688393 1.0 -0.9680813
-1.0 1.0 1.0 -0.9953841
rewards 0.4738865952331573
turbulence 16.329999923706055
trade: 4383
cost: 4550.267528993618
-0.57782423 -1.0 -1.0 0.9553082
-1.0 1.0 -1.0 0.8940698
-1.0 -0.98109627 1.0 -0.89496267
-1.0 0.98604333 -1.0 0.8360833
-0.84559083 0.03195808 1.0 0.9695096
0.7939098 1.0 -1.0 0.9706867
1.0 -1.0 1.0 0.96878004
1.0 -1.0 1.0 -0.9363789
0.20262796 1.0 1.0 -0.9215888
-1.0 1.0 -1.0 -0.43194807
1.0 -0.73968524 1.0 0.3740524
-1.0 0.3897977 -1.0 -0.9844552
0.117045045 -0.99228793 1.0 -0.7155938
1.0 -0.54974866 1.0 -0.95659465
1.0 -0.8497885 1.0 -0.858343
1.0 1.0 1.0 0.61649144
0.92225933 -1.0 1.0 0.988924
0.63116115 1.0 1.0 0.9477787
1.0 1.0 -1.0 -0.99718094
1.0 -1.0 -1.0 -0.95629466
-1.0 -1.0 -1.0 0.9481946
1.0 1.0 -1.0 0.81119
-1.0 -0.18081284 -1.0 -0.83966434
1.0 -1.0 -1.0 0.9489474
-0.43262145 -0.20837043 1.0 -0.6317203
1.0 1.0 -1.0 -0.6797585
1.0 -1.0 1.0 0.23814082
0.032869346 1.0 1.0 -0.9741176
-1.0 1.0 1.0 -0.9897246
rewards 0.20458894537810704
turbulence 17.010000228881836
```

```
trade: 4400
cost: 4570.362160295498
-0.8591471 -0.99946463 -1.0 0.9502337
-1.0 0.12573905 -1.0 0.48394918
-1.0 1.0 1.0 -0.15455633
-1.0 -0.015085265 -1.0 0.9732666
0.35948187 0.6355485 1.0 0.90924644
-1.0 1.0 -1.0 0.9710746
0.8881197 -1.0 1.0 0.8634374
1.0 -1.0 1.0 -0.92112947
-0.5281065 0.8732453 1.0 -0.9685227
-1.0 0.45079792 -1.0 -0.53519934
1.0 1.0 1.0 -0.8958538
-1.0 1.0 -1.0 -0.9445981
1.0 0.027786285 1.0 0.49564505
1.0 1.0 1.0 -0.97316754
1.0 1.0 1.0 -0.94182605
1.0 1.0 1.0 0.7758963
1.0 0.39658606 1.0 0.8280928
1.0 -1.0 1.0 0.9968145
1.0 0.018017579 -1.0 -0.95886225
1.0 0.017602831 -1.0 -0.9689639
0.7673927 -0.8390106 -1.0 0.9932647
0.7512337 -0.719453 -1.0 0.77354896
-1.0 0.5980083 -1.0 -0.83813316
1.0 -0.046424508 -1.0 0.9648609
1.0 1.0 1.0 -0.9506011
1.0 1.0 -1.0 -0.9344851
1.0 0.6932181 1.0 0.7403958
1.0 0.83130014 1.0 -0.9836146
-1.0 -0.5245449 1.0 -0.9958442
rewards -0.597919522871403
turbulence 18.450000762939453
trade: 4418
cost: 4573.4479567890285
0.6959337 -0.07616983 -1.0 0.91542387
-1.0 1.0 -1.0 0.64243114
-1.0 -1.0 1.0 -0.9081078
-1.0 0.80376536 -1.0 0.9587958
1.0 -0.74075097 1.0 0.79897785
-0.6138757 -1.0 -1.0 0.6903459
1.0 1.0 1.0 0.96621954
1.0 0.7033957 1.0 0.1272713
-0.398113 0.9303322 1.0 -0.9498943
-1.0 1.0 -1.0 -0.32705903
0.89950275 -1.0 1.0 0.455554
-1.0 -0.47455037 -1.0 -0.90063965
1.0 -1.0 1.0 -0.03133273
```

```
1.0 -0.8123992 1.0 -0.95643884
1.0 -1.0 1.0 -0.98417944
1.0 0.5967357 1.0 0.9672903
0.90202063 -0.56131476 1.0 0.93246794
0.27596283 -0.45368326 1.0 0.98821783
1.0 -0.11814071 -1.0 -0.907031
1.0 1.0 -1.0 -0.9274719
1.0 -0.7019931 -1.0 0.96288383
0.5322677 1.0 -1.0 0.9900459
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1.0 1.0 -1.0 0.9903152
0.697092 0.0069274753 1.0 -0.9595766
1.0 0.734988 -1.0 -0.836313
1.0 -0.37730017 1.0 0.8920318
0.5872183 0.30781963 1.0 -0.9959787
-1.0 0.70975566 1.0 -0.96961415
rewards -3.2354312669036913
turbulence 22.5
trade: 4435
cost: 4586.779993043911
-1.0 0.29228947 -1.0 0.32101226
-1.0 0.23647049 -1.0 0.98522997
-1.0 0.3556062 1.0 -0.9870375
-1.0 1.0 -1.0 0.97099924
-1.0 -0.93032515 1.0 0.9725863
-1.0 0.93743384 -1.0 0.9669403
0.40460712 -1.0 1.0 0.37122834
1.0 -1.0 1.0 -0.08692998
-1.0 -0.9425317 1.0 -0.64352286
-1.0 -0.22501162 -1.0 0.08159375
1.0 1.0 1.0 0.8032843
-1.0 1.0 -1.0 -0.98325926
1.0 0.673311 1.0 -0.81325805
1.0 0.5019598 1.0 -0.9453438
1.0 -0.3732435 1.0 -0.99562055
1.0 0.7042981 1.0 0.8813827
1.0 0.14246687 1.0 0.71201766
1.0 1.0 1.0 0.9785501
-1.0 -0.47039098 -1.0 -0.9621214
1.0 -1.0 -1.0 -0.98892677
-1.0 -1.0 -1.0 0.96994734
-1.0 1.0 -1.0 0.6773906
-1.0 1.0 -1.0 -0.73601174
1.0 -0.20074207 -1.0 0.98266363
-1.0 -0.38550895 1.0 -0.8153208
1.0 -0.15845272 -1.0 -0.9472977
1.0 -0.76095444 1.0 0.6673889
-0.58199376 0.25616 1.0 -0.99591666
```

```
-1.0 -1.0 1.0 -0.9855125
rewards 1.2114304391235347
turbulence 19.729999542236328
trade: 4451
cost: 4603.0919081134925
1.0 -0.78649485 -1.0 0.85842395
-1.0 -0.4832775 -1.0 0.67143464
-0.9145032 -1.0 1.0 -0.77561396
-1.0 -0.10267895 -1.0 0.99246514
0.5336818 -1.0 1.0 0.9101887
-1.0 0.086181045 -1.0 0.47048783
1.0 -0.66183007 1.0 0.08268356
1.0 1.0 1.0 -0.17341864
0.9674747 0.08642699 1.0 -0.90958107
-1.0 -1.0 -1.0 -0.33222246
1.0 -0.42018217 1.0 -0.08308375
-1.0 0.32692394 -1.0 -0.991738
0.23780799 -0.40947482 1.0 0.8231001
1.0 -0.038584143 1.0 -0.9435555
1.0 0.71429193 1.0 -0.961914
1.0 -1.0 1.0 0.92406964
-0.8016609 -0.15692373 1.0 0.86284757
1.0 1.0 1.0 0.9445386
1.0 1.0 -1.0 -0.95219404
1.0 -1.0 -1.0 -0.9611353
1.0 -0.45306084 -1.0 0.9913049
0.16545472 1.0 -1.0 0.978559
-1.0 1.0 -1.0 -0.68708867
1.0 1.0 -1.0 0.97608054
0.3821308 0.3056868 1.0 -0.8960309
1.0 -1.0 -1.0 -0.89254004
1.0 0.7263191 1.0 0.8222594
-0.28432772 -1.0 1.0 -0.9788568
-1.0 1.0 1.0 -0.9728282
rewards 1.1964204890709138
turbulence 17.90999984741211
trade: 4469
cost: 4614.749322092069
-1.0 -0.101049796 -1.0 0.9782057
-1.0 -0.44304818 -1.0 0.34077954
-1.0 -0.46745813 1.0 -0.7364783
-1.0 0.5236233 -1.0 0.991843
-0.018711008 0.7621745 1.0 0.9748553
-1.0 1.0 -1.0 0.90052295
1.0 1.0 1.0 0.8681983
0.76180595 -0.26284042 1.0 0.10439825
0.51774365 -1.0 1.0 -0.97095597
-1.0 -1.0 -1.0 -0.87656057
```

```
1.0 -0.29300934 1.0 0.11422658
-1.0 0.66688234 -1.0 -0.9938473
0.05423987 1.0 1.0 -0.5121716
1.0 1.0 1.0 -0.96449864
1.0 -1.0 1.0 -0.9658981
1.0 -0.08586252 1.0 0.94515157
1.0 -0.206162 1.0 0.9913001
-0.1500678 1.0 1.0 0.962952
1.0 -1.0 -1.0 -0.9762998
1.0 -0.3588793 -1.0 -0.87274784
0.29057157 -0.8345699 -1.0 0.92688274
0.90729344 0.6311532 -1.0 0.9908211
-1.0 1.0 -1.0 -0.9520553
1.0 -0.97564423 -1.0 0.9922682
-1.0 0.17463201 1.0 -0.8120816
1.0 -0.25150865 -1.0 -0.9223591
1.0 1.0 1.0 0.89780927
-0.15195882 -0.4377141 1.0 -0.94522125
-1.0 -0.4571108 1.0 -0.98381126
rewards -0.7852058864883613
turbulence 17.690000534057617
trade: 4486
cost: 4622.766469446195
0.4765061 0.49470094 -1.0 0.97799134
-1.0 0.60190254 -1.0 0.93899274
-1.0 -1.0 1.0 0.5602797
-0.7246274 0.05329585 -1.0 0.9872503
1.0 -1.0 1.0 0.9371972
-1.0 0.26869625 -1.0 0.9923829
1.0 1.0 1.0 0.9715407
1.0 -0.34199885 1.0 -0.6692037
1.0 0.8388322 1.0 -0.93815905
-1.0 1.0 -1.0 -0.2205745
1.0 0.68145674 1.0 -0.78204226
-1.0 1.0 -1.0 -0.85687345
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1.0 -0.6721927 1.0 -0.9681471
1.0 0.06241961 1.0 -0.99767965
1.0 0.019036442 1.0 0.8915783
0.20306927 0.06791291 1.0 0.9781891
1.0 0.8160873 1.0 0.9851432
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1.0 -1.0 -1.0 -0.6763208
-0.25856405 0.8162948 -1.0 0.9747319
-0.012539893 -0.7842369 -1.0 0.9996383
-1.0 -0.7303982 -1.0 -0.80990964
1.0 1.0 -1.0 0.9914973
-1.0 -0.14460029 1.0 -0.8530071
```

```
1.0 0.00090674683 -1.0 -0.8736922
1.0 0.4725365 1.0 0.49749827
1.0 0.2585314 1.0 -0.9619053
-1.0 0.4080455 1.0 -0.89322424
rewards 0.9266962503936841
turbulence 17.200000762939453
trade: 4504
cost: 4629.528956354155
-0.84415716 0.10596892 -1.0 0.80933
-0.073054075 0.94030154 -1.0 0.85656345
0.5900934 1.0 1.0 -0.9287567
0.4295342 -0.30344447 -1.0 0.9944999
-1.0 -1.0 1.0 0.93408895
-1.0 0.07709871 -1.0 0.75867784
1.0 -0.97464705 1.0 0.61320853
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0.74908817 -0.28898513 1.0 -0.95838356
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1.0 0.83469236 1.0 -0.96510875
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1.0 1.0 1.0 0.97345924
0.03848529 0.15464878 1.0 0.9846709
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1.0 1.0 -1.0 -0.8277872
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0.81562424 0.29347885 1.0 -0.9728007
1.0 1.0 -1.0 -0.9419691
1.0 -1.0 1.0 0.9687748
-0.5659012 1.0 1.0 -0.9551596
-1.0 1.0 1.0 -0.97833776
rewards 0.3697750396728516
turbulence 17.579999923706055
trade: 4522
cost: 4629.528956354155
-1.0 -0.3534859 -1.0 0.98891926
-1.0 -1.0 -1.0 0.11005521
-1.0 0.92396396 1.0 0.3274393
-1.0 -0.59014815 -1.0 0.9576545
-0.29320893 1.0 1.0 0.7879355
-1.0 -1.0 -1.0 0.52963066
1.0 1.0 1.0 0.8805022
```

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-0.13967192 -0.6602607 1.0 0.79495513
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-1.0 1.0 -1.0 -0.7676722
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1.0 1.0 1.0 -0.98669493
1.0 -0.78493214 1.0 -0.76922137
1.0 0.28658476 1.0 0.82756007
0.20303917 0.4425243 1.0 0.91035986
1.0 0.9556464 1.0 0.68381536
0.68948096 -1.0 -1.0 -0.9246996
1.0 -0.8476419 -1.0 -0.9713369
-1.0 0.84290755 -1.0 0.9653077
-0.77241945 1.0 -1.0 0.97661805
-1.0 -0.14323948 -1.0 -0.9015751
1.0 1.0 -1.0 0.99478114
-0.31180584 -1.0 1.0 -0.70546424
1.0 -0.9518523 -1.0 -0.91183525
1.0 1.0 1.0 0.8182974
-0.95110804 0.04426083 1.0 -0.9968814
-1.0 -0.74208057 1.0 -0.85525954
rewards -0.1333848347045947
turbulence 19.36000061035156
trade: 4539
cost: 4651.873984613432
-1.0 0.85393834 -1.0 0.9936824
-1.0 0.27238625 -1.0 -0.1367212
-1.0 -0.781331 1.0 -0.74924564
-1.0 0.15517363 -1.0 0.97264194
-0.02759793 -1.0 1.0 0.88048935
-1.0 0.3844356 -1.0 0.6071484
0.15484905 0.9309454 1.0 0.85979784
1.0 0.30882958 1.0 -0.75211513
0.10623425 0.8897465 1.0 -0.98305
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1.0 0.44397372 1.0 -0.96111834
1.0 0.88683236 1.0 0.90215886
1.0 -0.725557 1.0 0.98118925
1.0 1.0 1.0 0.9749398
0.9293278 1.0 -1.0 -0.966189
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-1.0 -0.109152794 -1.0 0.987509
```

```
-1.0 -1.0 -1.0 -0.5904146
1.0 -0.65498614 -1.0 0.9407103
-1.0 -1.0 1.0 -0.82052356
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1.0 1.0 1.0 0.3984095
-0.80975676 1.0 1.0 -0.91493374
-1.0 0.03829798 1.0 -0.85535854
rewards -0.8133457258361858
turbulence 18.309999465942383
trade: 4557
cost: 4655.087529596342
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-1.0 -1.0 -1.0 0.62759876
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-1.0 -1.0 -1.0 0.9843404
0.21939588 -1.0 1.0 0.74230075
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1.0 1.0 1.0 -0.953374
-1.0 -1.0 -1.0 -0.9666857
1.0 1.0 1.0 0.9948877
1.0 0.9855913 1.0 -0.9798897
1.0 -1.0 1.0 -0.76486105
1.0 -0.14540097 1.0 0.7328038
1.0 -0.2409836 1.0 0.99627984
1.0 -0.45961893 1.0 0.80301976
0.33028078 0.058542773 -1.0 -0.99240005
1.0 -0.19498833 -1.0 -0.72187173
0.93047625 1.0 -1.0 0.9638226
-1.0 -0.054675072 -1.0 0.9572506
-1.0 -0.3965713 -1.0 -0.9023009
1.0 -0.57450175 -1.0 0.87021995
-0.47673374 -1.0 1.0 -0.93838876
1.0 -0.80959046 -1.0 -0.87153655
1.0 0.44519377 1.0 0.6810851
0.4240979 0.2619835 1.0 -0.82174635
-1.0 0.01625076 1.0 -0.9796219
rewards 1.238433996508806
turbulence 17.700000762939453
trade: 4572
cost: 4665.685751153959
-1.0 1.0 -1.0 0.9865036
-1.0 -1.0 -1.0 0.23933601
-1.0 0.7490828 1.0 -0.20152336
-1.0 -0.7139231 -1.0 0.9851185
```

```
-1.0 -1.0 1.0 0.9603374
-1.0 -1.0 -1.0 0.98843217
-0.15277743 1.0 1.0 0.95758915
0.24532032 1.0 1.0 -0.5804709
-0.79261416 -0.4633464 1.0 -0.9371668
-1.0 -0.7909923 -1.0 0.014121532
1.0 -0.029162563 1.0 -0.70020974
-1.0 -1.0 -1.0 -0.95123637
1.0 0.972608 1.0 0.870347
1.0 0.30488858 1.0 -0.98539585
1.0 -1.0 1.0 -0.9651234
1.0 -1.0 1.0 0.9086001
1.0 -1.0 1.0 0.9563885
0.61894447 0.7509396 1.0 0.9315407
0.6966416 -1.0 -1.0 -0.93707395
1.0 -0.21458198 -1.0 -0.9789242
0.9314264 0.77672267 -1.0 0.8150152
0.70207524 0.36500934 -1.0 0.40318155
-1.0 -0.5743805 -1.0 -0.8139528
1.0 1.0 -1.0 0.9855194
-0.4640833 0.10238533 1.0 -0.91528535
1.0 0.8880101 -1.0 -0.35618943
1.0 0.29204676 1.0 0.16149414
0.27136046 -1.0 1.0 -0.3664459
-1.0 -0.77830696 1.0 -0.99888146
rewards -0.6508048500061036
turbulence 18.239999771118164
trade: 4585
cost: 4665.685751153959
-0.058173478 -1.0 -1.0 0.9988586
-1.0 -0.3287803 -1.0 0.41696727
-1.0 0.4160251 1.0 -0.083458066
-1.0 0.36956775 -1.0 0.9805968
0.9203463 -0.0458566 1.0 0.8390926
0.11165702 -0.6006199 -1.0 0.7977153
0.4080857 0.175123 1.0 0.98265195
0.17912936 0.49464178 1.0 0.20001447
1.0 0.5798284 1.0 -0.9614979
-1.0 0.05582437 -1.0 -0.9464497
1.0 1.0 1.0 0.4383061
0.29864335 1.0 -1.0 -0.9882128
-0.027209282 0.40177348 1.0 -0.31137323
1.0 -0.4012112 1.0 -0.9151357
1.0 -1.0 1.0 -0.95277786
1.0 0.07970619 1.0 0.8607044
-0.72867024 -0.32024387 1.0 0.99523973
-1.0 -0.4260861 1.0 0.98725677
0.3119849 0.28616422 -1.0 -0.99225014
```

```
1.0 -0.01156355 -1.0 -0.7553834
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0.023764223 0.87007135 -1.0 0.9190707
-1.0 -0.16216686 -1.0 -0.97399205
1.0 -0.31594032 -1.0 0.9931512
-1.0 1.0 1.0 -0.88183856
1.0 0.93127555 -1.0 -0.93653727
1.0 -1.0 1.0 0.9901
0.36907762 0.8567326 1.0 -0.91825193
-1.0 1.0 1.0 -0.83759356
rewards -0.08029556888123043
turbulence 19.459999084472656
trade: 4601
cost: 4677.652372888579
-1.0 -1.0 -1.0 0.9638094
-1.0 1.0 -1.0 0.6027818
-1.0 0.14118356 1.0 -0.7206729
-1.0 0.095704764 -1.0 0.8977077
0.038614836 -0.24448416 1.0 0.71359944
-1.0 -1.0 -1.0 0.9595089
1.0 1.0 1.0 0.97557425
1.0 -0.95180523 1.0 -0.48487818
-0.88598806 1.0 1.0 -0.96345955
-1.0 0.012268379 -1.0 -0.060320437
1.0 0.16287524 1.0 -0.8893391
-1.0 0.32562393 -1.0 -0.92814165
1.0 1.0 1.0 0.34335423
1.0 -1.0 1.0 -0.96166253
1.0 0.31532085 1.0 -0.9229188
1.0 1.0 1.0 0.65273297
0.28872204 -0.5636033 1.0 0.95849
1.0 0.57753706 1.0 0.9806032
0.55714285 1.0 -1.0 -0.97980666
1.0 -1.0 -1.0 -0.9788554
0.41927576 1.0 -1.0 0.9476203
-0.81700736 -0.6355841 -1.0 0.9397001
-1.0 -1.0 -1.0 -0.8796463
1.0 -1.0 -1.0 0.9306383
-1.0 -0.37648988 1.0 -0.6929085
1.0 -0.53049564 -1.0 -0.94083166
1.0 1.0 1.0 0.34900033
-1.0 1.0 1.0 -0.90155417
-1.0 0.6623465 1.0 -0.98406637
rewards 1.4353860243637115
turbulence 18.040000915527344
trade: 4616
cost: 4690.537620279325
-1.0 0.13263127 -1.0 0.99168694
```

```
-0.48189485 1.0 -1.0 0.86548686
-1.0 0.4350787 1.0 -0.87818563
-1.0 0.5476196 -1.0 0.9817138
0.58274376 1.0 1.0 0.9600667
-1.0 0.39605325 -1.0 0.9893447
1.0 1.0 1.0 0.97561
1.0 -0.6272917 1.0 -0.077996075
1.0 1.0 1.0 -0.9767396
-1.0 0.0062362775 -1.0 0.09482145
1.0 1.0 1.0 0.27457893
-1.0 -0.94361216 -1.0 -0.9574281
1.0 0.31919998 1.0 0.73539484
1.0 0.6194269 1.0 -0.91237444
1.0 -0.94178414 1.0 -0.99366826
1.0 0.99312687 1.0 0.9078678
1.0 1.0 1.0 0.9781604
1.0 0.061313376 1.0 0.9488597
1.0 0.7265406 -1.0 -0.9929415
1.0 1.0 -1.0 -0.9421099
0.10222736 1.0 -1.0 0.97785866
0.58714443 1.0 -1.0 0.98310924
-1.0 -1.0 -1.0 -0.9210738
1.0 -1.0 -1.0 0.9245837
0.9988306 0.38058287 1.0 -0.91964436
1.0 -1.0 -1.0 -0.8672847
1.0 1.0 1.0 -0.0071824193
-0.9041414 0.18873318 1.0 -0.98203754
-1.0 0.16319719 1.0 -0.9958671
rewards -0.9233761070251465
turbulence 17.969999313354492
trade: 4635
cost: 4690.537620279325
-1.0 -1.0 -1.0 0.9502022
-1.0 -0.42391372 -1.0 0.7273319
-1.0 -0.98611224 1.0 -0.4746536
-1.0 0.8966288 -1.0 0.9828459
0.16106614 1.0 1.0 0.6757159
-1.0 -1.0 -1.0 0.7014291
1.0 -0.7742508 1.0 0.9291363
0.6512588 -1.0 1.0 -0.02908057
-0.6795913 -0.032097727 1.0 -0.8714106
-1.0 -0.8806053 -1.0 -0.5581436
1.0 1.0 1.0 0.98646975
-1.0 1.0 -1.0 -0.9873593
1.0 -0.10149747 1.0 0.81729865
1.0 -1.0 1.0 -0.9297156
1.0 -1.0 1.0 -0.9728318
1.0 1.0 1.0 0.8032546
```

```
1.0 0.82151955 1.0 0.9990498
0.89904964 0.7511482 1.0 0.3277421
0.60922086 -0.38924843 -1.0 -0.99505496
1.0 -0.073422246 -1.0 -0.93982285
-0.09963134 -1.0 -1.0 0.90730906
1.0 0.105430156 -1.0 0.9826393
-1.0 -1.0 -1.0 -0.91602015
1.0 1.0 -1.0 0.9092711
-0.36359325 -0.21504141 1.0 -0.9651077
1.0 0.4009331 -1.0 -0.8002747
1.0 0.3611165 1.0 0.832098
0.4110635 -0.03807974 1.0 -0.9555517
-1.0 0.060090244 1.0 -0.96212834
rewards 1.309681530410005
turbulence 17.280000686645508
trade: 4647
cost: 4705.145358476652
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-1.0 1.0 -1.0 0.8956394
-1.0 0.93988913 1.0 0.7084614
-0.61358523 1.0 -1.0 0.9822993
0.12471791 -1.0 1.0 0.935488
-1.0 -1.0 -1.0 0.8554485
-0.65760434 1.0 1.0 0.88317347
1.0 -0.5337716 1.0 -0.3203193
-0.16603942 1.0 1.0 -0.99584365
-1.0 0.221474 -1.0 -0.824998
1.0 -0.47479156 1.0 -0.4244628
-1.0 -1.0 -1.0 -0.98363864
1.0 0.0038058534 1.0 0.059782267
1.0 -0.4731801 1.0 -0.8294612
1.0 -0.09111582 1.0 -0.9551433
1.0 1.0 1.0 0.92948663
0.40306073 0.43324098 1.0 0.9901614
1.0 -0.5457742 1.0 0.99426913
0.9232377 0.38715237 -1.0 -0.95249224
1.0 0.25388008 -1.0 -0.8938385
-0.6561463 -1.0 -1.0 0.948354
0.07420933 0.90468824 -1.0 0.9617281
-1.0 -1.0 -1.0 -0.9576026
1.0 -0.2547339 -1.0 0.96328235
-0.22626844 1.0 1.0 -0.88531494
1.0 -1.0 -1.0 -0.9443776
1.0 0.67197895 1.0 0.98524284
-1.0 0.306322 1.0 -0.80417526
-1.0 0.0829888 1.0 -0.99147147
rewards 0.9770540165786632
turbulence 16.149999618530273
```

```
trade: 4661
cost: 4721.0153718280935
-0.37229413 -1.0 -1.0 0.83476555
-0.67201185 0.4930361 -1.0 0.85655856
-1.0 0.849206 1.0 0.069287896
-1.0 0.7168135 -1.0 0.99381495
1.0 0.8539982 1.0 0.8003967
-1.0 0.27764517 -1.0 0.9606087
0.7025579 -0.03843391 1.0 0.9870055
1.0 0.39331514 1.0 -0.47655898
0.35514665 1.0 1.0 -0.9703663
-1.0 -0.56631833 -1.0 -0.28648227
1.0 0.7738001 1.0 0.73346424
-1.0 -1.0 -1.0 -0.89361656
1.0 1.0 1.0 0.9224076
1.0 0.314663 1.0 -0.93353343
1.0 1.0 1.0 -0.98607
1.0 -1.0 1.0 0.84979534
0.97612774 0.1597726 1.0 0.991869
0.71387374 1.0 1.0 0.9473393
0.8814621 1.0 -1.0 -0.98295593
1.0 -1.0 -1.0 -0.83565307
-1.0 1.0 -1.0 0.9465742
0.27667043 0.32661402 -1.0 0.92784095
-1.0 0.5969492 -1.0 -0.9023543
1.0 0.17215633 -1.0 0.9975815
-1.0 -0.8500021 1.0 -0.8914424
1.0 0.84002644 -1.0 -0.9756203
1.0 1.0 1.0 0.57392013
1.0 -1.0 1.0 -0.9676157
-1.0 -1.0 1.0 -0.93329525
rewards -0.037214966201782225
turbulence 16.719999313354492
trade: 4680
cost: 4721.0153718280935
-1.0 0.12237236 -1.0 0.6934972
-1.0 -0.70481753 -1.0 0.22033298
-1.0 0.054549053 1.0 -0.48600656
-1.0 -1.0 -1.0 0.9574276
1.0 -0.95386237 1.0 0.99291897
-1.0 1.0 -1.0 0.8599982
0.18577135 -1.0 1.0 0.9248619
1.0 -1.0 1.0 -0.77694345
0.92073107 0.3864049 1.0 -0.93462026
-1.0 1.0 -1.0 -0.30823076
1.0 1.0 1.0 0.3249557
-1.0 -0.6312723 -1.0 -0.9732766
1.0 -1.0 1.0 0.7348788
```

```
1.0 -0.9412004 1.0 -0.99275625
1.0 1.0 1.0 -0.9927621
1.0 -0.41079244 1.0 0.84443605
1.0 -1.0 1.0 0.9861144
1.0 1.0 1.0 0.69604754
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1.0 1.0 -1.0 -0.9721967
-0.4896173 -0.46309382 -1.0 0.97207236
-1.0 1.0 -1.0 0.9654372
-1.0 -1.0 -1.0 -0.9119312
1.0 0.6581067 -1.0 0.91990983
-1.0 0.82753986 1.0 -0.98848623
1.0 0.29588807 -1.0 -0.90015256
0.66219974 -0.55386347 1.0 0.5882082
-0.57094175 0.030973434 1.0 -0.8241182
-1.0 0.0067171454 1.0 -0.97896403
rewards 0.8547038286522032
turbulence 16.790000915527344
trade: 4696
cost: 4743.439480020537
-0.2020505 0.26547292 -1.0 0.97990537
-1.0 0.53015506 -1.0 0.9444419
-1.0 -0.6416888 1.0 -0.9621619
-1.0 -0.49931848 -1.0 0.993731
-0.31984815 1.0 1.0 0.29954338
0.7255044 1.0 -1.0 0.93905616
1.0 -0.39244527 1.0 0.9831662
1.0 -1.0 1.0 -0.699696
1.0 0.20702371 1.0 -0.82257956
-1.0 0.056813523 -1.0 -0.12944686
1.0 -0.81879354 1.0 -0.6643312
-1.0 1.0 -1.0 -0.9796108
1.0 -1.0 1.0 0.6288688
1.0 -1.0 1.0 -0.9645171
1.0 -0.4052955 1.0 -0.9614208
1.0 0.47444087 1.0 0.9790268
0.8275756 -0.69049424 1.0 0.99833274
1.0 -1.0 1.0 0.932292
1.0 -0.43370986 -1.0 -0.9484991
1.0 1.0 -1.0 -0.99665767
-0.24856362 0.43767112 -1.0 0.99027956
0.65261453 -0.3585609 -1.0 0.9872763
-1.0 -1.0 -1.0 -0.80873233
1.0 1.0 -1.0 0.96199024
-1.0 -1.0 1.0 -0.9744052
1.0 -0.05243548 -1.0 -0.5759361
1.0 -1.0 1.0 0.97795415
-0.4265276 1.0 1.0 -0.93967384
```

```
-1.0 0.61747074 1.0 -0.9836265
rewards 1.4781091653991725
turbulence 16.170000076293945
trade: 4711
cost: 4751.895601297392
-0.73671824 0.829373 -1.0 0.9827242
-1.0 0.27257183 -1.0 0.30346298
-1.0 1.0 1.0 -0.29650748
-1.0 1.0 -1.0 0.96226525
-1.0 -0.37946656 1.0 0.78283715
-0.56486255 1.0 -1.0 0.9764929
1.0 0.6257554 1.0 0.98538756
0.75112903 0.36655402 1.0 -0.18854147
0.48584652 -0.39269307 1.0 -0.91436535
-1.0 -0.15814441 -1.0 0.3542781
1.0 1.0 1.0 0.7233298
-1.0 1.0 -1.0 -0.7753947
1.0 -0.45386034 1.0 0.8677318
1.0 -0.7371434 1.0 -0.9737293
1.0 -1.0 1.0 -0.98283654
0.7955272 -0.20857838 1.0 0.97703123
0.49952424 0.769105 1.0 0.9927411
1.0 1.0 1.0 0.8674736
1.0 -0.8580514 -1.0 -0.992025
1.0 0.61943305 -1.0 -0.9738395
-1.0 -0.39163774 -1.0 0.98697555
-1.0 -0.95022285 -1.0 0.89927745
-1.0 0.4970827 -1.0 -0.80128443
1.0 0.66724586 -1.0 0.9899163
1.0 -0.89406466 1.0 -0.16342878
1.0 0.21889946 -1.0 -0.26708055
1.0 0.40730077 1.0 0.9421884
1.0 -0.08169451 1.0 -0.9423657
-1.0 0.30930996 1.0 -0.8322745
rewards 0.2082428435722366
turbulence 15.59000015258789
trade: 4727
cost: 4769.717131242766
-0.7812531 -0.87842417 -1.0 0.9383997
-1.0 0.9775449 -1.0 0.9308566
-1.0 0.48993298 1.0 -0.7787163
-1.0 -0.6849433 -1.0 0.9186796
-0.61802596 0.21082689 1.0 0.8544636
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1.0 0.6720322 1.0 0.7878194
0.8811552 -1.0 1.0 -0.19622481
0.8626512 -0.07878475 1.0 -0.8618715
-1.0 0.2107388 -1.0 -0.8375428
```

```
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-1.0 -1.0 -1.0 -0.8143793
1.0 1.0 1.0 0.42889452
1.0 1.0 1.0 -0.9297183
1.0 0.120127976 1.0 -0.9869813
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0.94049335 0.052522093 1.0 0.9962871
1.0 -0.87868786 1.0 0.97721744
1.0 0.19497854 -1.0 -0.98729926
1.0 -1.0 -1.0 -0.92537653
0.26006147 1.0 -1.0 0.98841715
1.0 1.0 -1.0 0.82755685
-0.8986604 0.11894816 -1.0 -0.799739
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-0.761414 0.05339005 1.0 -0.9777987
1.0 -0.44340992 -1.0 -0.98565704
1.0 0.23021117 1.0 0.64608634
-0.10793664 -1.0 1.0 -0.87292904
-1.0 -0.15390421 1.0 -0.9679528
rewards 0.13643698788564654
turbulence 15.449999809265137
trade: 4743
cost: 4792.624218481078
-0.80727214 0.13696247 -1.0 0.9268327
-1.0 -0.7777826 -1.0 0.8263129
-1.0 -0.08807823 1.0 -0.22379392
-1.0 0.39532578 -1.0 0.99317575
1.0 -0.8796785 1.0 0.59323335
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1.0 0.998752 1.0 0.9476652
1.0 0.13028169 1.0 -0.88138413
-0.15291563 -1.0 1.0 -0.7762141
-1.0 -0.18594034 -1.0 -0.9786689
1.0 -0.68910354 1.0 0.9664664
-1.0 -1.0 -1.0 -0.9253521
1.0 0.27505636 1.0 -0.24394739
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1.0 1.0 1.0 -0.98806196
1.0 0.115027815 1.0 0.85941935
1.0 -1.0 1.0 0.9695029
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1.0 1.0 -1.0 -0.9546073
1.0 -0.30056044 -1.0 -0.9616533
-1.0 1.0 -1.0 0.9939388
0.5865077 1.0 -1.0 0.9686663
-1.0 -0.86548555 -1.0 -0.8961304
1.0 1.0 -1.0 0.9898305
-1.0 1.0 1.0 -0.7327945
```

```
1.0 0.19218391 -1.0 -0.9591629
1.0 -0.604879 1.0 0.48324513
1.0 1.0 1.0 -0.8893458
-1.0 -1.0 1.0 -0.93851835
rewards 0.6445922439384507
turbulence 16.1200008392334
trade: 4761
cost: 4792.718434064879
-1.0 -1.0 -1.0 0.94790745
-1.0 -1.0 -1.0 0.88739157
-1.0 -1.0 1.0 -0.6413422
-1.0 0.8826629 -1.0 0.9751899
-0.3724125 0.23292747 1.0 0.7974405
-1.0 0.9651207 -1.0 0.95392656
1.0 -0.50891435 1.0 0.9962493
0.29232156 -0.79230577 1.0 -0.91126025
-1.0 0.48491222 1.0 -0.950619
-1.0 -1.0 -1.0 -0.9548401
1.0 1.0 1.0 0.28103924
-1.0 -1.0 -1.0 -0.7858794
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1.0 0.88901484 1.0 -0.95045626
1.0 1.0 1.0 -0.8813272
1.0 1.0 1.0 0.9810852
1.0 -1.0 1.0 0.9800472
1.0 0.96826875 1.0 0.78454804
1.0 -0.45195746 -1.0 -0.9834453
1.0 0.8556252 -1.0 -0.77131045
0.39537132 -0.7080258 -1.0 0.97923815
0.8709867 1.0 -1.0 0.976297
-1.0 1.0 -1.0 -0.8218287
1.0 -0.96282357 -1.0 0.95767593
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1.0 -1.0 -1.0 -0.8863576
1.0 -0.38527304 1.0 0.12913978
-1.0 1.0 1.0 -0.8912571
-1.0 -0.1312455 1.0 -0.9202813
rewards -0.5279008811862906
turbulence 17.90999984741211
trade: 4778
cost: 4801.797421098721
-1.0 0.7731821 -1.0 0.96519876
-1.0 1.0 -1.0 0.9081309
0.62046003 -1.0 1.0 0.18384719
-1.0 -0.35376084 -1.0 0.99251485
-1.0 1.0 1.0 0.7786459
-1.0 -0.8429035 -1.0 0.9853082
0.27570838 -0.84065104 1.0 0.8956734
```

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1.0 0.5617575 1.0 0.44872546
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1.0 1.0 1.0 0.30984175
1.0 1.0 1.0 -0.9895743
1.0 1.0 1.0 -0.91347384
0.5759318 1.0 1.0 0.608274
0.8274578 0.22077426 1.0 0.9475714
0.6863381 0.1568308 1.0 0.9230517
1.0 0.3745119 -1.0 -0.9375441
1.0 0.26886225 -1.0 -0.6616316
0.77279 -1.0 -1.0 0.9834449
-1.0 0.80422264 -1.0 0.96035266
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1.0 0.011875927 -1.0 0.9894353
-1.0 0.46821547 1.0 -0.5892622
1.0 0.5210105 -1.0 -0.9415583
1.0 0.24893008 1.0 0.5671692
0.88335645 -1.0 1.0 -0.99725634
-1.0 -0.29085648 1.0 -0.76981413
rewards -1.1153349282424898
turbulence 21.56999969482422
trade: 4796
cost: 4807.979463380826
-1.0 -1.0 -1.0 0.8958975
-0.92545617 1.0 -1.0 0.43502617
-1.0 1.0 1.0 0.446684
-1.0 1.0 -1.0 0.86946833
0.907458 -1.0 1.0 0.9353726
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1.0 -0.5716695 1.0 -0.98718816
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0.2715752 0.98154974 1.0 0.9768481
0.7421764 0.46911907 1.0 0.9937308
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1.0 0.84516996 -1.0 -0.9236246
1.0 1.0 -1.0 0.9768573
-1.0 -0.72994125 -1.0 0.9688028
```

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-1.0 1.0 -1.0 -0.990876
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0.6061317 -1.0 1.0 -0.86585855
1.0 0.7331697 -1.0 -0.7192446
1.0 -0.99553156 1.0 0.7434194
-1.0 -0.004240364 1.0 -0.95864683
-1.0 0.006112933 1.0 -0.9866536
rewards -0.11816645934905391
turbulence 21.670000076293945
trade: 4814
cost: 4817.523249223722
-1.0 -0.01244244 -1.0 0.9920572
-1.0 0.48519278 -1.0 0.7336273
-1.0 -0.2525758 1.0 0.6591183
-1.0 -0.82211924 -1.0 0.97679377
0.27771837 0.2864959 1.0 0.7681867
0.9055202 -0.6177371 -1.0 0.89733803
0.7947251 0.20040028 1.0 0.86784077
1.0 -0.23022206 1.0 0.520483
-1.0 0.84807825 1.0 -0.49618745
-1.0 1.0 -1.0 0.19210482
1.0 0.041901574 1.0 -0.19425762
-1.0 0.65034044 -1.0 -0.99221647
-1.0 -0.61226016 1.0 -0.23551816
1.0 -1.0 1.0 -0.9631615
1.0 1.0 1.0 -0.9863652
1.0 1.0 1.0 0.9381981
1.0 1.0 1.0 0.9550772
-0.27636135 -1.0 1.0 0.88292515
-0.017901301 -0.74238706 -1.0 -0.9853858
1.0 0.7797659 -1.0 -0.976914
0.40481818 0.8828725 -1.0 0.96695495
0.2803998 0.67188495 -1.0 0.9481628
-1.0 -1.0 -1.0 -0.8354799
1.0 -0.13769808 -1.0 0.9482275
0.2669887 0.9722325 1.0 -0.90689754
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1.0 1.0 1.0 0.9071052
1.0 -1.0 1.0 -0.95930016
-1.0 -0.8698763 1.0 -0.9943257
rewards 1.4899127181945602
turbulence 18.559999465942383
trade: 4832
cost: 4819.652960435879
-1.0 -0.45836508 -1.0 0.9159913
-1.0 1.0 -1.0 0.078092575
-1.0 -0.10115677 1.0 -0.9804353
-1.0 1.0 -1.0 0.9765841
```

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-0.6057623 -0.13359208 1.0 0.6755239
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1.0 1.0 1.0 0.9740858
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-1.0 1.0 -1.0 -0.2488544
1.0 0.37125885 1.0 -0.6834409
-1.0 0.5084292 -1.0 -0.7180328
1.0 -1.0 1.0 0.18164897
1.0 0.40974802 1.0 -0.9788225
1.0 -1.0 1.0 -0.792081
1.0 0.8044877 1.0 0.8393084
1.0 1.0 1.0 0.9254638
0.9165387 -1.0 1.0 0.9907931
1.0 -0.18129092 -1.0 -0.9782828
1.0 1.0 -1.0 -0.7644427
0.56982136 1.0 -1.0 0.995666
1.0 -1.0 -1.0 0.9399601
-1.0 1.0 -1.0 -0.6150634
1.0 0.46241206 -1.0 0.90475774
-0.9889853 0.09882772 1.0 -0.8346852
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1.0 -0.32464755 1.0 0.24071944
-0.120147735 -0.46625423 1.0 -0.9906599
-1.0 0.5871599 1.0 -0.99473315
rewards 0.5194424179077148
turbulence 17.149999618530273
trade: 4848
cost: 4819.652960435879
1.0 0.79484755 -1.0 0.75841117
-1.0 1.0 -1.0 0.90746856
-1.0 1.0 1.0 -0.65499675
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-1.0 -0.51728463 -1.0 0.826857
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1.0 0.067080215 1.0 -0.7609017
1.0 -0.7458925 1.0 -0.9375693
0.66332173 1.0 1.0 0.93993473
0.92723453 -0.39374104 1.0 0.9966124
0.83261 0.68740153 1.0 0.91681147
1.0 1.0 -1.0 -0.9892513
```

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1.0 -1.0 -1.0 -0.99027157
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1.0 1.0 1.0 0.7204381
-0.14834177 1.0 1.0 -0.9880147
-1.0 -0.37464187 1.0 -0.9527277
rewards 0.5576827487243805
turbulence 17.219999313354492
trade: 4863
cost: 4846.924155595792
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-1.0 1.0 -1.0 0.1789043
-1.0 1.0 1.0 -0.36476701
-1.0 -1.0 -1.0 0.99454355
1.0 -1.0 1.0 0.6449946
-1.0 1.0 -1.0 0.9015424
1.0 1.0 1.0 0.9859501
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-1.0 -1.0 -1.0 -0.93783885
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-1.0 -0.81607443 -1.0 -0.9685009
1.0 1.0 1.0 0.8766432
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1.0 1.0 1.0 0.8077091
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1.0 1.0 1.0 0.93737864
1.0 0.73649246 -1.0 -0.91164935
1.0 -0.59696794 -1.0 -0.9248432
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1.0 0.23524675 -1.0 0.99209523
-1.0 -1.0 -1.0 -0.8033755
1.0 1.0 -1.0 0.75230205
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1.0 -0.8074204 1.0 -0.026051521
-0.87702423 -0.9781182 1.0 -0.8241705
-1.0 -1.0 1.0 -0.84404284
rewards 1.0278856551963838
turbulence 16.790000915527344
trade: 4877
cost: 4847.143344446195
-0.9913755 -0.8095255 -1.0 0.9946946
```

```
-0.9954972 -0.99941915 -1.0 0.28553283
-0.90014064 1.0 1.0 0.3565917
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0.94396955 -0.8027165 1.0 0.90208864
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1.0 -1.0 1.0 0.12858403
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-1.0 -1.0 -1.0 -0.9135398
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-1.0 -0.42248923 -1.0 -0.89170986
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1.0 1.0 1.0 0.9852488
1.0 -1.0 1.0 0.95174265
0.15408349 -0.3450615 1.0 0.7130251
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1.0 0.7793577 -1.0 -0.9718238
0.32492298 -1.0 -1.0 0.9082794
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1.0 -1.0 -1.0 -0.7271548
1.0 -1.0 1.0 0.1610372
0.16833143 0.6233889 1.0 -0.98964953
-1.0 1.0 1.0 -0.8637699
rewards -1.9486391301887576
turbulence 18.84000015258789
trade: 4894
cost: 4847.682343782438
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-1.0 0.5333065 -1.0 -0.9739753
1.0 1.0 1.0 0.8682234
1.0 0.40354 1.0 -0.9413762
1.0 -1.0 1.0 -0.9785754
1.0 0.15215272 1.0 0.84859085
```

```
1.0 -0.90504646 1.0 0.9910281
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1.0 1.0 1.0 0.91232264
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-1.0 0.24191913 1.0 -0.9873917
rewards 1.1606437107795617
turbulence 16.389999389648438
trade: 4911
cost: 4855.893940515531
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-1.0 -1.0 -1.0 0.5338638
-1.0 0.33143023 1.0 -0.5043852
-1.0 -0.65269464 -1.0 0.98178446
0.51928705 0.7934164 1.0 0.8829887
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0.7791978 -0.3960927 1.0 0.76962197
1.0 1.0 1.0 -0.59021735
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-1.0 -1.0 -1.0 -0.9544798
1.0 0.3482189 1.0 0.9749917
1.0 0.34953153 1.0 -0.9404478
1.0 1.0 1.0 -0.9062289
1.0 0.6508335 1.0 0.22698939
-0.5756259 -0.39853033 1.0 0.97776663
0.6079582 -0.37513527 1.0 0.8494592
1.0 1.0 -1.0 -0.9972696
1.0 -0.14009885 -1.0 -0.9929122
-0.81253934 0.33576307 -1.0 0.9794805
-1.0 -0.14452901 -1.0 0.9747338
-1.0 -0.74066764 -1.0 -0.7953105
1.0 1.0 -1.0 0.9635718
-1.0 0.0899543 1.0 -0.976775
1.0 -1.0 -1.0 -0.79331005
1.0 -0.5249603 1.0 0.98490596
-0.8750258 1.0 1.0 -0.9547214
-1.0 0.28864226 1.0 -0.9943595
rewards -0.8476478617523099
turbulence 16.190000534057617
```

```
trade: 4927
cost: 4867.12367955972
-1.0 -0.85685456 -1.0 0.7841748
-1.0 1.0 -1.0 0.85014486
-1.0 -0.4003441 1.0 -0.93135446
-1.0 -1.0 -1.0 0.99598694
0.34798732 -1.0 1.0 0.9422381
-1.0 0.91679025 -1.0 0.9661646
0.963651 1.0 1.0 0.99101233
0.3116007 0.43812633 1.0 -0.8529279
0.19350377 0.7208121 1.0 -0.93529594
-1.0 1.0 -1.0 -0.44598925
1.0 0.19671258 1.0 -0.8255881
-1.0 -1.0 -1.0 -0.98047423
1.0 -0.95575905 1.0 0.9006947
1.0 1.0 1.0 -0.991523
1.0 0.6319904 1.0 -0.8537358
1.0 0.6743585 1.0 0.7008505
1.0 -1.0 1.0 0.9288819
0.6745346 -0.9059377 1.0 0.87282336
1.0 -1.0 -1.0 -0.94886434
1.0 0.25167102 -1.0 -0.9767355
0.7000412 0.3659427 -1.0 0.9487208
-0.744671 0.17823657 -1.0 0.90348136
-1.0 -1.0 -1.0 -0.9366456
1.0 1.0 -1.0 0.9491383
-1.0 1.0 1.0 -0.9256662
1.0 1.0 -1.0 -0.9762504
1.0 0.5717965 1.0 -0.016676784
-1.0 1.0 1.0 -0.942245
-1.0 0.74641407 1.0 -0.7855456
rewards -0.5207047897338868
turbulence 16.479999542236328
trade: 4944
cost: 4867.12367955972
-0.42492402 -1.0 -1.0 0.53824675
-0.881979 1.0 -1.0 0.82337034
-1.0 1.0 1.0 0.59487057
-1.0 0.02649112 -1.0 0.98468375
1.0 1.0 1.0 0.48327017
-1.0 -1.0 -1.0 0.9346678
-0.69142497 -1.0 1.0 0.7620158
0.39869368 1.0 1.0 -0.51677537
-1.0 1.0 1.0 -0.74517953
-1.0 0.51556283 -1.0 0.27669096
1.0 -1.0 1.0 -0.6542798
-1.0 -1.0 -1.0 -0.8442322
-0.0283252 0.057562165 1.0 0.7406199
```

```
1.0 -0.45032558 1.0 -0.9897112
1.0 -0.16768771 1.0 -0.75382745
1.0 0.99466324 1.0 0.3916185
1.0 -1.0 1.0 0.97774553
1.0 -0.2462382 1.0 0.9934845
1.0 1.0 -1.0 -0.9733183
1.0 -0.86673754 -1.0 -0.86344033
1.0 0.6058049 -1.0 0.9954848
-1.0 -1.0 -1.0 0.99344313
-1.0 -0.53342456 -1.0 -0.33628535
1.0 1.0 -1.0 0.9974079
-1.0 1.0 1.0 -0.7312748
1.0 -0.091028534 -1.0 -0.76298994
1.0 0.37267178 1.0 0.80875397
-0.40164697 0.1442982 1.0 -0.9899302
-1.0 1.0 1.0 -0.9903097
rewards -0.4122347815040499
turbulence 16.110000610351562
trade: 4959
cost: 4876.852758333218
-0.82276714 -0.15443842 -1.0 0.95407486
-1.0 -0.7197955 -1.0 0.94762754
-1.0 0.26863712 1.0 -0.58890605
-1.0 -0.21690315 -1.0 0.93349576
0.22513348 1.0 1.0 0.98548675
-1.0 1.0 -1.0 0.9666939
1.0 1.0 1.0 0.884972
1.0 -1.0 1.0 0.063341975
0.98689425 1.0 1.0 -0.8222651
-1.0 -0.7713543 -1.0 -0.743305
1.0 1.0 1.0 0.18227005
-1.0 0.21803361 -1.0 -0.95652485
0.31115198 1.0 1.0 0.112032175
1.0 -1.0 1.0 -0.9965028
1.0 -0.091664255 1.0 -0.9830155
1.0 0.20156465 1.0 0.92429066
0.97091734 -1.0 1.0 0.9543061
1.0 -0.36991796 1.0 0.95440555
1.0 -0.27564734 -1.0 -0.9385443
1.0 -1.0 -1.0 -0.9512316
0.7878509 0.8058896 -1.0 0.92135954
1.0 0.29899678 -1.0 0.942824
-0.90957594 -0.17661525 -1.0 -0.780897
1.0 0.14547224 -1.0 0.9805577
-1.0 1.0 1.0 -0.8040518
1.0 0.8572137 -1.0 -0.88354063
1.0 -0.07920149 1.0 0.5338168
0.5584628 1.0 1.0 -0.9462358
```

```
-1.0 -1.0 1.0 -0.90644425
rewards 0.5859055831630714
turbulence 16.40999984741211
trade: 4975
cost: 4881.627580846798
0.44055915 1.0 -1.0 0.9252106
-1.0 1.0 -1.0 0.35694528
-1.0 -0.95143604 1.0 -0.48662692
-1.0 1.0 -1.0 0.98319125
-0.57593435 0.46848875 1.0 -0.77285564
-1.0 0.7576245 -1.0 0.942032
0.88636744 -0.072570264 1.0 0.9508096
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rewards -0.5854300728797913
turbulence 16.40999984741211
trade: 4993
cost: 4930.38391801263
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-1.0 -1.0 -1.0 -0.4648428
```

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1.0 -0.2507313 1.0 0.7388263
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1.0 1.0 -1.0 -0.9496909
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rewards -1.1417095035354607
turbulence 18.13999938964844
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cost: 4936.910063749324
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-0.78320897 0.9370226 1.0 -0.6347681
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rewards -0.018868816579831766
turbulence 17.959999084472656
trade: 5026
cost: 4943.616398950588
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rewards 0.1028470788608538
turbulence 18.799999237060547
trade: 5044
cost: 4947.987842092525
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-1.0 -1.0 -1.0 0.9505224
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rewards -0.9038788617649116
turbulence 20.950000762939453
trade: 5062
cost: 4960.927716302883
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-0.74907076 1.0 -1.0 0.8883494
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rewards 0.8143544659805485
turbulence 19.3700008392334
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cost: 4971.41328034402
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turbulence 19.459999084472656
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-1.0 -1.0 1.0 0.08382237
-1.0 0.399328 -1.0 0.96979415
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rewards 1.002783269638056
turbulence 18.18000030517578
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cost: 5002.192766168605
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turbulence 18.690000534057617
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1.0 1.0 1.0 0.9068301
0.8396616 -1.0 1.0 -0.9899624
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rewards -1.218213591036224
turbulence 20.809999465942383
trade: 5150
cost: 5031.247528474818
-1.0 1.0 -1.0 0.9629251
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1.0 0.35657054 1.0 0.7821083
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rewards -3.270777949574287
turbulence 25.709999084472656
trade: 5164
cost: 5050.915574022302
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```

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rewards 0.12727022053834516
turbulence 24.36000061035156
trade: 5180
cost: 5068.472111925134
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-1.0 1.0 -1.0 0.82587576
-1.0 -0.046173707 1.0 -0.34375274
-1.0 -1.0 -1.0 0.9969702
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1.0 1.0 1.0 0.9205731
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rewards 1.5044901985168457
turbulence 20.8700008392334
```

```
trade: 5197
cost: 5068.472111925134
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-0.47742903 -0.09955984 1.0 0.9955268
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1.0 1.0 1.0 0.67295146
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0.55000484 -0.064541675 1.0 0.11639893
1.0 1.0 1.0 -0.9464276
1.0 -0.073029235 1.0 -0.9802519
1.0 1.0 1.0 0.50937057
1.0 0.05003059 1.0 0.9704912
-0.5133946 1.0 1.0 0.9310775
1.0 1.0 -1.0 -0.9923199
1.0 1.0 -1.0 -0.37689543
1.0 -1.0 -1.0 0.82292986
-0.43512654 1.0 -1.0 0.9540765
-1.0 0.26404595 -1.0 -0.66874063
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-1.0 -1.0 1.0 -0.9037392
1.0 1.0 -1.0 -0.3701557
1.0 0.5221182 1.0 0.9013543
-0.44523108 1.0 1.0 -0.9822535
-1.0 -1.0 1.0 -0.9727726
rewards 1.8798116156951759
turbulence 18.6299991607666
trade: 5212
cost: 5068.8811815662475
-0.8705518 -1.0 -1.0 0.9515047
-1.0 -0.6961868 -1.0 0.77075267
-1.0 -0.31520796 1.0 -0.5855075
-1.0 0.32406324 -1.0 0.9833083
-0.38989547 -0.9626557 1.0 0.97619724
-0.6649521 -0.43689796 -1.0 0.95154047
1.0 -1.0 1.0 0.8048148
1.0 0.13991135 1.0 -0.38798153
-0.6324594 -0.36683157 1.0 -0.8781878
-1.0 1.0 -1.0 -0.9666557
1.0 -1.0 1.0 -0.67678726
-1.0 -1.0 -1.0 -0.99511373
1.0 -0.82753843 1.0 0.83056927
```

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1.0 0.842239 1.0 -0.9806858
1.0 0.61513406 1.0 -0.9352037
1.0 0.1250562 1.0 0.62130916
1.0 -0.4911153 1.0 0.96387804
0.7242202 1.0 1.0 0.5316254
1.0 -0.32769465 -1.0 -0.9848411
1.0 -0.7477814 -1.0 -0.8803204
-1.0 -1.0 -1.0 0.97259223
-1.0 0.83188987 -1.0 0.8504269
-1.0 0.11760843 -1.0 -0.60438955
1.0 -0.01836896 -1.0 0.9815012
-0.33465382 -1.0 1.0 -0.97024906
1.0 0.5464925 -1.0 -0.78190863
1.0 -0.5637113 1.0 0.6969458
0.22437388 -1.0 1.0 -0.8158198
-1.0 -1.0 1.0 -0.88236326
rewards -1.1414536989486543
turbulence 17.75
trade: 5227
cost: 5094.891460542687
-0.6999515 -0.56998444 -1.0 0.97994184
-1.0 0.47086954 -1.0 0.8931664
-1.0 -1.0 1.0 -0.9771792
-1.0 0.41577253 -1.0 0.9843018
-0.68761396 1.0 1.0 0.85921216
-1.0 1.0 -1.0 0.9182358
1.0 -0.9777117 1.0 0.98621655
1.0 0.37616795 1.0 -0.55193645
0.24741659 1.0 1.0 -0.96825856
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-1.0 -0.5746209 -1.0 -0.9665305
1.0 0.8318016 1.0 0.8483871
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1.0 0.66382325 1.0 0.74359155
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0.8966105 0.7721926 1.0 0.99427974
1.0 0.38503045 -1.0 -0.99286926
1.0 1.0 -1.0 -0.710354
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-0.45538795 0.3434236 -1.0 0.94228625
-1.0 -1.0 -1.0 -0.89302045
1.0 1.0 -1.0 0.9958072
-0.48339224 1.0 1.0 -0.7891561
1.0 1.0 -1.0 -0.58605057
1.0 1.0 1.0 0.09692621
0.4549902 0.5881482 1.0 -0.94437957
```

```
-1.0 0.24500936 1.0 -0.9675491
rewards -0.14466286460876
turbulence 18.76000022888184
trade: 5245
cost: 5101.039069490441
-1.0 -1.0 -1.0 0.9339622
-1.0 -0.23428683 -1.0 0.804983
-1.0 1.0 1.0 -0.068125784
-1.0 1.0 -1.0 0.9399185
-1.0 -0.35196102 1.0 0.8198205
-0.102021694 1.0 -1.0 0.9848175
0.6671525 -0.1554529 1.0 0.994483
1.0 1.0 1.0 0.16980326
-1.0 0.28872517 1.0 -0.92882913
-1.0 0.36088377 -1.0 -0.9421942
1.0 -0.17401212 1.0 0.40130842
-1.0 0.21582696 -1.0 -0.7402218
1.0 -1.0 1.0 0.18400097
1.0 1.0 1.0 -0.95254636
1.0 -1.0 1.0 -0.9558002
1.0 1.0 1.0 0.94084215
1.0 0.0030743182 1.0 0.9711814
0.7629835 0.102724075 1.0 0.27416682
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1.0 0.28036952 -1.0 -0.95285594
-1.0 0.62722135 -1.0 0.98704505
-0.71780616 -0.73913753 -1.0 0.9815954
-1.0 -0.7703758 -1.0 -0.75929284
1.0 1.0 -1.0 0.9723134
0.41426337 -0.045444295 1.0 0.024725914
1.0 -0.50406647 -1.0 -0.9162523
1.0 -1.0 1.0 0.55017114
0.5881072 0.61507535 1.0 -0.971749
-0.44128513 -1.0 1.0 -0.83722734
rewards -2.406570092670829
turbulence 23.25
trade: 5262
cost: 5107.46592164422
-0.3872882 -1.0 -1.0 0.88041496
-0.9368657 1.0 -1.0 -0.57594466
-1.0 1.0 1.0 -0.35247016
0.029403925 0.05713758 -1.0 0.9906564
1.0 -0.32201725 1.0 0.71919787
-1.0 1.0 -1.0 0.9507481
1.0 1.0 1.0 0.97662497
-0.17100966 0.5738311 1.0 -0.1744237
0.5413284 -0.81391776 1.0 -0.96389115
-1.0 -1.0 -1.0 -0.8122512
```

```
1.0 0.61664504 1.0 0.5831938
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1.0 0.06718473 1.0 -0.9198052
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1.0 1.0 1.0 0.95156455
1.0 0.87580466 1.0 0.97840047
1.0 0.6926307 1.0 0.9862983
0.14644146 0.92531574 -1.0 -0.97240835
1.0 1.0 -1.0 -0.93098474
0.07578549 0.040093064 -1.0 0.9835664
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1.0 -1.0 -1.0 0.991851
1.0 1.0 1.0 -0.9327669
1.0 0.3835513 -1.0 -0.8630809
1.0 0.15110272 1.0 0.83462584
1.0 1.0 1.0 -0.98086774
-1.0 -1.0 1.0 -0.98877937
rewards 0.4759811755889794
turbulence 22.559999465942383
trade: 5279
cost: 5107.671923170098
-1.0 0.6867754 -1.0 0.9801227
-1.0 -1.0 -1.0 0.9222188
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0.1442368 1.0 1.0 0.9877275
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1.0 0.8332014 1.0 -0.8954476
1.0 1.0 1.0 0.77569664
1.0 0.08150807 1.0 0.99283874
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-1.0 -1.0 -1.0 -0.5923971
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1.0 0.23451102 1.0 0.23390245
```

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1.0 1.0 1.0 0.96303487
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-1.0 1.0 1.0 -0.98707914
rewards -2.2041945939319443
turbulence 23.13999938964844
trade: 5298
cost: 5108.156348970421
0.28861248 -1.0 -1.0 0.82914853
-1.0 1.0 -1.0 0.9786171
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-1.0 1.0 -1.0 0.9717293
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1.0 1.0 1.0 0.58390784
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1.0 1.0 -1.0 -0.95076823
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0.47305065 -1.0 -1.0 0.9814335
-1.0 0.54843044 -1.0 -0.92174715
1.0 0.311216 -1.0 0.84765303
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1.0 -0.43623883 1.0 0.6174333
-1.0 -0.5398579 1.0 -0.87689924
-1.0 0.4815848 1.0 -0.96398485
rewards 1.4837296923133778
turbulence 21.100000381469727
trade: 5315
cost: 5121.0967495975565
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-1.0 1.0 -1.0 0.9822295
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-1.0 -1.0 -1.0 0.9944997
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-1.0 0.9607835 -1.0 0.9064888
1.0 -1.0 1.0 0.9807384
```

```
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1.0 0.65328926 1.0 0.3852321
1.0 0.9140926 1.0 0.8027688
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1.0 1.0 -1.0 -0.939502
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rewards -0.9275989800750744
turbulence 22.959999084472656
trade: 5331
cost: 5139.7395731144015
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-1.0 1.0 -1.0 0.9754658
-1.0 0.98623145 1.0 0.9561064
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0.03020513 1.0 1.0 0.9692694
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-1.0 -1.0 -1.0 -0.37004602
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1.0 1.0 1.0 -0.98372346
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1.0 0.94358706 1.0 0.8951613
1.0 -1.0 1.0 0.7925674
1.0 0.80331725 1.0 0.98779297
1.0 -0.45716852 -1.0 -0.98668593
1.0 -1.0 -1.0 -0.94368595
1.0 -0.16871187 -1.0 0.993636
-0.028478041 -1.0 -1.0 0.9925916
```

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-1.0 0.2944064 -1.0 -0.84725606
1.0 0.14926098 -1.0 0.9929459
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1.0 1.0 1.0 0.5949707
0.39909548 1.0 1.0 -0.9703762
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rewards 1.7055249640487602
turbulence 21.299999237060547
trade: 5347
cost: 5155.507281869895
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1.0 0.8659223 1.0 0.8611462
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-1.0 0.05172914 1.0 0.4972793
1.0 0.7216995 1.0 -0.97174174
1.0 -1.0 1.0 -0.99601626
0.66108775 1.0 1.0 0.82308173
1.0 -0.38290638 1.0 0.9238677
1.0 0.48538074 1.0 0.99185586
0.50616515 -1.0 -1.0 -0.9810996
1.0 0.34786084 -1.0 -0.9753549
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0.7876825 -0.4532871 -1.0 0.3953936
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1.0 1.0 -1.0 0.99815345
-1.0 0.7330466 1.0 -0.5810598
1.0 -0.507309 -1.0 -0.9206806
1.0 0.36634076 1.0 -0.07871771
1.0 1.0 1.0 -0.9657705
1.0 0.29552382 1.0 -0.96521777
rewards 0.7033343924785732
turbulence 21.0
trade: 5363
cost: 5189.92676574517
-0.2060715 -0.3961123 -1.0 0.99420285
-1.0 0.41976076 -1.0 0.5993564
-1.0 0.76025146 1.0 -0.9881358
-1.0 1.0 -1.0 0.9534204
```

```
1.0 -1.0 1.0 0.9095725
-1.0 -1.0 -1.0 0.97595406
1.0 0.2220487 1.0 0.8937683
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1.0 -0.03525889 1.0 0.8705665
1.0 0.055246323 1.0 0.9972646
0.5273824 -0.89707565 1.0 0.90818954
1.0 0.39648646 -1.0 -0.9486538
1.0 -0.30784142 -1.0 -0.8861885
1.0 -0.8322794 -1.0 0.9599346
-1.0 1.0 -1.0 0.99675214
-1.0 1.0 -1.0 -0.9803942
1.0 -1.0 -1.0 0.9684069
-1.0 1.0 1.0 -0.57603896
1.0 0.32101327 -1.0 -0.86215955
1.0 1.0 1.0 0.67135
-1.0 1.0 1.0 -0.99061316
-1.0 -0.2951745 1.0 -0.9499844
rewards 1.915100344146346
turbulence 19.540000915527344
trade: 5381
cost: 5194.707484895714
-0.42147785 -0.0673925 -1.0 0.9519286
-1.0 0.39197373 -1.0 0.82859373
-1.0 -0.43098933 1.0 -0.71910655
-1.0 -1.0 -1.0 0.86657906
-0.5255539 1.0 1.0 0.9847529
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1.0 1.0 1.0 0.3314563
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1.0 0.60922813 1.0 -0.9661443
1.0 -0.2419568 1.0 -0.98781055
1.0 1.0 1.0 0.90482163
1.0 0.5716273 1.0 0.9778842
0.18530786 -0.7010298 1.0 0.93725705
1.0 -1.0 -1.0 -0.9678955
```

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-0.9947343 -1.0 -1.0 -0.93296385
1.0 1.0 -1.0 0.9787154
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1.0 -1.0 1.0 0.9642043
0.33887637 1.0 1.0 -0.9895936
-1.0 -0.9791645 1.0 -0.9333474
rewards 0.0963334959396394
turbulence 18.770000457763672
trade: 5395
cost: 5200.982308671958
-0.6042621 -1.0 -1.0 0.8289621
-0.8258457 0.9112636 -1.0 0.058993936
-1.0 1.0 1.0 -0.21539122
-1.0 -0.42761034 -1.0 0.94750357
-1.0 1.0 1.0 0.7475469
0.7811978 0.6082028 -1.0 0.9699606
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0.32143745 0.69092226 1.0 -0.85310525
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1.0 1.0 1.0 -0.43625188
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1.0 0.94178563 1.0 0.59982204
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1.0 -1.0 1.0 -0.99317855
1.0 1.0 1.0 0.95366716
0.10367429 -1.0 1.0 0.98160386
0.16755605 -0.9601496 1.0 0.9837582
1.0 1.0 -1.0 -0.86382735
1.0 1.0 -1.0 -0.9590303
1.0 -1.0 -1.0 0.96615696
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-1.0 0.8173908 -1.0 -0.9258534
1.0 0.82977784 -1.0 0.9684416
-1.0 0.4560431 1.0 -0.9036844
1.0 1.0 -1.0 -0.98334885
1.0 -1.0 1.0 0.98730063
-1.0 0.3731549 1.0 -0.9891237
-1.0 -0.10567704 1.0 -0.9828736
rewards -1.19843208667757
turbulence 20.0
trade: 5410
cost: 5202.3126549701765
-0.6110495 0.63566923 -1.0 0.9586643
```

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-1.0 0.14561406 -1.0 0.4682449
-1.0 -0.20134664 1.0 0.08981204
-1.0 0.90381706 -1.0 0.9868381
-0.567067 -0.16635084 1.0 0.54626656
-1.0 0.08475624 -1.0 0.93777955
1.0 1.0 1.0 0.78860164
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-1.0 -1.0 -1.0 -0.4251232
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1.0 1.0 1.0 -0.9612784
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1.0 1.0 1.0 0.9491807
1.0 -0.8908032 1.0 0.9090328
1.0 1.0 1.0 0.84294415
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1.0 0.087721854 -1.0 -0.88554627
0.9007816 1.0 -1.0 0.9706236
-1.0 -0.18531783 -1.0 0.9376879
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0.29458994 -0.01858867 1.0 -0.8221779
1.0 -0.6096817 -1.0 -0.9562898
1.0 1.0 1.0 0.94472027
0.86864036 0.3005855 1.0 -0.8837001
-1.0 0.72898364 1.0 -0.9959971
rewards -0.023859079721057788
turbulence 19.850000381469727
trade: 5428
cost: 5205.246526979454
-1.0 -0.48378897 -1.0 0.38620758
-1.0 -0.2121 -1.0 0.9214134
-1.0 1.0 1.0 0.46165943
-1.0 1.0 -1.0 0.9875283
1.0 0.60652953 1.0 0.89982486
-1.0 1.0 -1.0 0.9247918
0.95632744 0.25677204 1.0 0.99359787
0.2982198 1.0 1.0 0.15593135
-1.0 1.0 1.0 -0.9441285
-1.0 1.0 -1.0 0.027629852
1.0 0.025471497 1.0 0.25871527
-1.0 0.53982514 -1.0 -0.8597045
1.0 -0.7988502 1.0 0.72728026
1.0 -1.0 1.0 -0.97596276
1.0 0.7068527 1.0 -0.97170174
1.0 1.0 1.0 0.9808507
```

```
1.0 -1.0 1.0 0.88761663
0.7320295 0.5732194 1.0 0.920619
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1.0 1.0 -1.0 -0.956108
0.49121177 -0.7076089 -1.0 0.958145
-1.0 -0.05282484 -1.0 0.96326447
-1.0 -0.324008 -1.0 -0.795488
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-1.0 -1.0 1.0 -0.59970236
1.0 -0.773649 -1.0 -0.91452265
1.0 0.50367844 1.0 0.78262234
-0.5293812 1.0 1.0 -0.982137
-1.0 0.3073516 1.0 -0.97958475
rewards 0.26754345082931685
turbulence 18.63999938964844
trade: 5447
cost: 5211.706855112083
-1.0 -1.0 -1.0 0.9727155
-1.0 0.76671207 -1.0 0.9030802
-0.8808307 0.09339716 1.0 0.43486452
-1.0 -1.0 -1.0 0.9919238
-0.99435 0.35615766 1.0 0.9081994
-1.0 -1.0 -1.0 0.9761803
0.7080724 1.0 1.0 0.89644325
-0.018538117 1.0 1.0 -0.9467187
-0.5048895 -0.5502201 1.0 -0.9442475
-1.0 0.48596424 -1.0 -0.51099354
1.0 -0.5835792 1.0 0.73239136
-1.0 1.0 -1.0 -0.937063
-0.28048277 -0.7187046 1.0 -0.7056199
1.0 -0.2214517 1.0 -0.96544546
1.0 -0.6389303 1.0 -0.983612
1.0 -0.10548562 1.0 0.92323923
0.613408 -1.0 1.0 0.99083257
1.0 -0.46748415 1.0 0.9476603
1.0 1.0 -1.0 -0.513406
1.0 1.0 -1.0 -0.9027799
-0.16464216 -1.0 -1.0 0.9913883
-1.0 0.3821884 -1.0 0.8772342
-1.0 0.6675999 -1.0 -0.78121424
1.0 1.0 -1.0 0.9084474
-0.10788214 1.0 1.0 -0.8034106
1.0 1.0 -1.0 -0.9502792
1.0 1.0 1.0 0.616626
1.0 -0.018060088 1.0 -0.9678891
-1.0 -1.0 1.0 -0.94524044
rewards 1.458798028874211
turbulence 16.860000610351562
```

```
trade: 5461
cost: 5236.4563217716295
-1.0 -0.17453569 -1.0 0.99748635
-1.0 0.5509353 -1.0 0.80496323
-1.0 0.21117367 1.0 0.73386586
-1.0 -0.73478556 -1.0 0.9747535
0.32955003 0.14795077 1.0 0.8605832
-1.0 0.21907851 -1.0 0.95349455
1.0 0.20550695 1.0 0.97786283
0.71098906 -0.6342138 1.0 -0.8421248
0.008239329 1.0 1.0 -0.98607045
-1.0 -0.4322559 -1.0 -0.054446757
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-1.0 0.17886247 -1.0 -0.9745559
1.0 0.6313656 1.0 0.62754834
1.0 0.62119746 1.0 -0.9886507
1.0 -0.7572717 1.0 -0.9339925
1.0 1.0 1.0 0.8913443
0.41502696 -1.0 1.0 0.9848031
1.0 -1.0 1.0 0.9174293
1.0 -1.0 -1.0 -0.9720538
1.0 0.60895205 -1.0 -0.9650067
-0.8081236 1.0 -1.0 0.9786389
0.6335337 -1.0 -1.0 0.9952657
-1.0 -0.04115835 -1.0 -0.83750844
1.0 -1.0 -1.0 0.7146008
-1.0 -0.31129873 1.0 -0.80605364
1.0 -1.0 -1.0 -0.95069927
1.0 1.0 1.0 0.24759626
-0.35987335 1.0 1.0 -0.91542643
-1.0 1.0 1.0 -0.9826095
rewards 0.30678582725524906
turbulence 16.299999237060547
trade: 5477
cost: 5236.4563217716295
0.35478747 -1.0 -1.0 0.8949361
0.7008836 0.8832167 -1.0 0.95991683
0.7285019 -1.0 1.0 0.36476052
-1.0 -1.0 -1.0 0.9917226
0.33404338 0.52436155 1.0 0.60305357
-0.60792625 1.0 -1.0 0.96454954
1.0 -0.5169419 1.0 0.9677477
0.83726096 0.2696406 1.0 -0.5740559
-1.0 1.0 1.0 -0.89741164
-1.0 0.5190794 -1.0 -0.42400527
1.0 1.0 1.0 0.21503067
-1.0 1.0 -1.0 -0.9752825
1.0 0.30776057 1.0 0.7531868
```

```
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1.0 -1.0 1.0 0.8135778
1.0 0.6577921 1.0 0.97781897
0.261814 -0.59214854 1.0 0.98826146
1.0 0.4831682 -1.0 -0.92299366
1.0 1.0 -1.0 -0.971207
1.0 -0.8272278 -1.0 0.9921982
0.10651751 1.0 -1.0 0.62477756
-1.0 1.0 -1.0 -0.74499345
1.0 1.0 -1.0 0.9975977
0.82048124 -1.0 1.0 -0.93446434
1.0 1.0 -1.0 -0.9706684
1.0 0.0012790859 1.0 0.98772645
-1.0 -0.19478703 1.0 -0.9981073
-1.0 0.15559068 1.0 -0.9937077
rewards -0.7943122257232667
turbulence 16.309999465942383
trade: 5494
cost: 5236.4563217716295
-1.0 0.114292264 -1.0 0.9825082
-1.0 -0.78354967 -1.0 0.77104855
-1.0 0.1779657 1.0 -0.9864378
-1.0 1.0 -1.0 0.9945848
0.46504173 1.0 1.0 0.8998982
-1.0 0.7380313 -1.0 0.8995085
0.122074485 -0.5937091 1.0 0.9834572
-0.08235192 0.25912473 1.0 -0.61763525
0.11403492 -0.79137546 1.0 -0.9790972
-1.0 -0.054413363 -1.0 -0.619511
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1.0 0.41515866 1.0 0.20828462
1.0 -0.6074741 1.0 -0.9199292
1.0 -0.014738664 1.0 -0.9031776
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0.16962016 -0.6894889 1.0 0.920848
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-0.44318908 -0.00014276803 -1.0 0.9787891
-1.0 1.0 -1.0 0.965683
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1.0 0.41921505 -1.0 -0.87511307
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-0.54334265 -0.17371541 1.0 -0.98024786
```

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rewards 1.2157923737060512
turbulence 15.699999809265137
trade: 5509
cost: 5248.015090509423
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-1.0 1.0 1.0 -0.8839124
-1.0 0.7892046 -1.0 0.9911227
0.584356 -0.98003703 1.0 0.83852506
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1.0 -1.0 -1.0 0.88835406
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-1.0 -0.32422143 1.0 -0.98766536
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rewards 1.6902328026668403
turbulence 15.489999771118164
trade: 5525
cost: 5265.210726408012
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-1.0 -0.5525974 -1.0 0.7133441
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0.027170658 0.64585483 -1.0 0.95903206
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-1.0 1.0 1.0 -0.8590081
-1.0 -0.8718427 -1.0 -0.4925909
```

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-1.0 1.0 -1.0 -0.8271421
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1.0 -0.66119933 1.0 0.47893488
1.0 -1.0 1.0 0.9774325
1.0 -0.8142785 1.0 0.86598396
0.1444397 1.0 -1.0 -0.5884794
1.0 -0.8836058 -1.0 -0.8609517
0.1689697 -0.25728554 -1.0 0.9823662
-0.5271154 -1.0 -1.0 0.99593115
-0.54079366 -1.0 -1.0 -0.95411724
1.0 1.0 -1.0 0.9922695
0.06171596 0.1990285 1.0 -0.8397267
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1.0 0.2630662 1.0 0.73186636
0.18738501 0.59192085 1.0 -0.90694124
-1.0 -1.0 1.0 -0.93395084
rewards 0.9702787777725375
turbulence 15.010000228881836
trade: 5543
cost: 5289.268358076101
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-1.0 -1.0 -1.0 0.95030284
-1.0 -0.015106589 1.0 0.0103036165
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0.43532133 -0.10579136 1.0 0.9929054
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1.0 1.0 1.0 0.2097485
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1.0 0.81137645 1.0 0.97842
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0.92038757 0.576397 1.0 0.94697833
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1.0 1.0 -1.0 -0.8630455
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1.0 0.6975136 -1.0 0.9755839
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```

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-1.0 1.0 1.0 -0.98472106
rewards 0.8322353693847545
turbulence 15.43000030517578
trade: 5561
cost: 5302.868742902761
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turbulence 15.239999771118164
trade: 5578
cost: 5306.679301160818
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```

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1.0 0.5343312 1.0 0.9787321
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1.0 -1.0 -1.0 0.9747859
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0.80494636 1.0 1.0 -0.88707256
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rewards -0.4686326084526023
turbulence 15.979999542236328
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cost: 5327.620105077749
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```

```
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1.0 1.0 -1.0 -0.78755146
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0.008131016 1.0 1.0 -0.991564
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rewards 0.1360400137085002
turbulence 16.979999542236328
trade: 5613
cost: 5338.191304357534
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-1.0 -0.5714201 -1.0 0.9974202
-0.49290183 0.51382476 1.0 0.8771229
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1.0 1.0 1.0 0.6121999
1.0 1.0 1.0 -0.9934512
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1.0 0.7000344 1.0 0.8535955
1.0 -0.8063971 1.0 0.96521854
1.0 1.0 1.0 0.87211394
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-1.0 -1.0 1.0 -0.8604742
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rewards 0.1360400137085002
turbulence 16.979999542236328
trade: 5613
cost: 5338.191304357534
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False
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```

```
[23]:  1484349.2154968667
```

```
[24]:  dates = e_trade_gym.date_memory
```

```
[27]:  ticks_dates = list()
       for i in range(len(dates)):
           if i % 50 == 0:
               ticks_dates.append(dates[i])
```

```
[25]:  ress_a2c = list()
       summ = 0
       for i in rewards_a2c:
           summ += i
           ress_a2c.append(summ)

       ress_ddpg = list()
       summ = 0
       for i in rewards_ddpg:
           summ += i
           ress_ddpg.append(summ)

       ress_ppo = list()
       summ = 0
       for i in rewards_ppo:
           summ += i
           ress_ppo.append(summ)

       ress_sac = list()
       summ = 0
       for i in rewards_sac:
           summ += i
           ress_sac.append(summ)

       ress_vote = list()
       summ = 0
       for i in rewards_vote:
           summ += i
           ress_vote.append(summ)
```
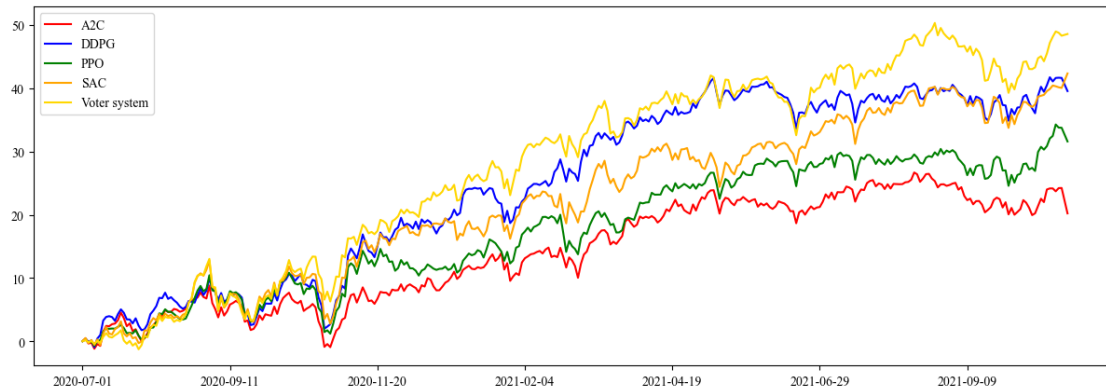
```
[28]:  plt.plot(dates, ress_a2c, c='r', label='A2C')
       plt.plot(dates, ress_ddpg, c='b', label='DDPG')
       plt.plot(dates, ress_ppo, c='g', label='PPO')
       plt.plot(dates, ress_sac, c='orange', label='SAC')
       plt.plot(dates, ress_vote, c='gold', label='Voter system')
       plt.legend()
       plt.xticks(ticks_dates)
       plt.savefig('./results/reward.png')
```

```
plt.show()
```



```
[29]: ddd = zip(dates, cost_a2c, cost_ddpg, cost_ppo, cost_sac, cost_vote)
      df = pd.DataFrame(ddd)
      df.columns = ['date', 'cost_a2c', 'cost_ddpg', 'cost_ppo', 'cost_sac',␣
       ↪'cost_vote']
      df
```
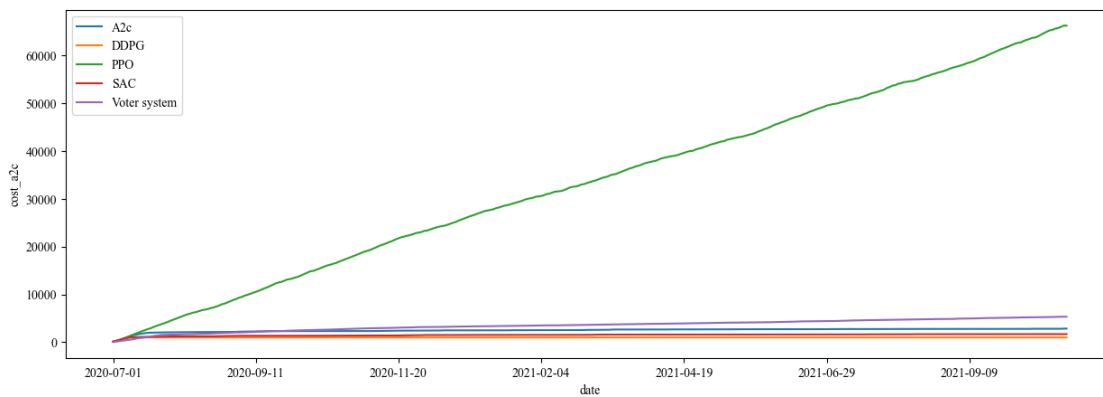
[29]:

	date	cost_a2c	cost_ddpg	cost_ppo	cost_sac	\
0	2020-07-01	125.303276	149.633932	110.743843	145.979616	
1	2020-07-02	284.391413	299.633603	253.411528	288.639505	
2	2020-07-06	459.697164	451.848013	412.563236	455.233081	
3	2020-07-07	667.216069	602.408298	639.639219	607.148710	
4	2020-07-08	854.341601	753.483849	855.054235	767.388385	
..	...	...	...	...	...	
330	2021-10-21	2815.790215	999.000973	65569.849512	1696.200065	
331	2021-10-22	2815.790215	999.000973	65701.990618	1696.200065	
332	2021-10-25	2815.790215	999.000973	65942.991620	1696.200065	
333	2021-10-26	2848.528217	999.000973	66214.483166	1696.200065	
334	2021-10-27	2848.528217	999.000973	66214.483166	1696.200065	

	cost_vote
0	44.251478
1	128.004358
2	227.652016
3	314.493045
4	397.033263
..	...
330	5302.868743
331	5306.679301
332	5327.620105
333	5338.191304
334	5338.191304

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```
[335 rows x 6 columns]
```

```
[30]: sns.lineplot(data=df, x="date", y="cost_a2c", label='A2c')
      sns.lineplot(data=df, x="date", y="cost_ddpg", label='DDPG')
      sns.lineplot(data=df, x="date", y="cost_ppo", label='PPO')
      sns.lineplot(data=df, x="date", y="cost_sac", label='SAC')
      sns.lineplot(data=df, x="date", y="cost_vote", label='Voter system')
      plt.xticks(ticks_dates)
      plt.legend()

      plt.savefig('./results/costs.png')
```



```
[31]: ddd = zip(dates, trade_a2c, trade_ddpg, trade_ppo, trade_sac, trade_vote)
      df = pd.DataFrame(ddd)
      df.columns = ['date', 'trade_a2c', 'trade_ddpg', 'trade_ppo', 'trade_sac',␣
        ↪'trade_vote']
      df
```
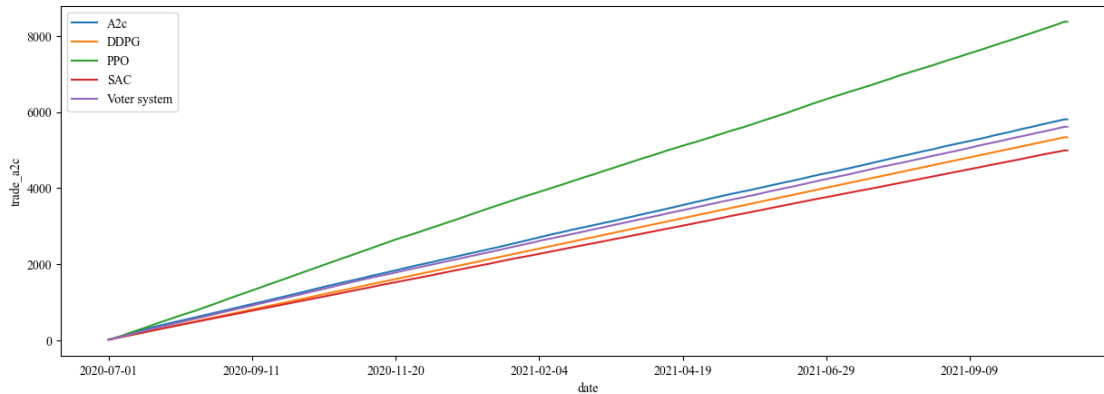
```
[31]:           date  trade_a2c  trade_ddpg  trade_ppo  trade_sac  trade_vote
      0    2020-07-01         13          15         15         16          13
      1    2020-07-02         30          30         34         32          29
      2    2020-07-06         50          45         56         48          47
      3    2020-07-07         73          60         79         64          65
      4    2020-07-08         94          75        102         79          82
      ..          ...        ...         ...        ...        ...         ...
      330  2021-10-21       5757        5289       8294       4947        5561
      331  2021-10-22       5775        5305       8323       4962        5578
      332  2021-10-25       5792        5321       8351       4975        5595
      333  2021-10-26       5809        5337       8377       4990        5613
      334  2021-10-27       5809        5337       8377       4990        5613

      [335 rows x 6 columns]
```
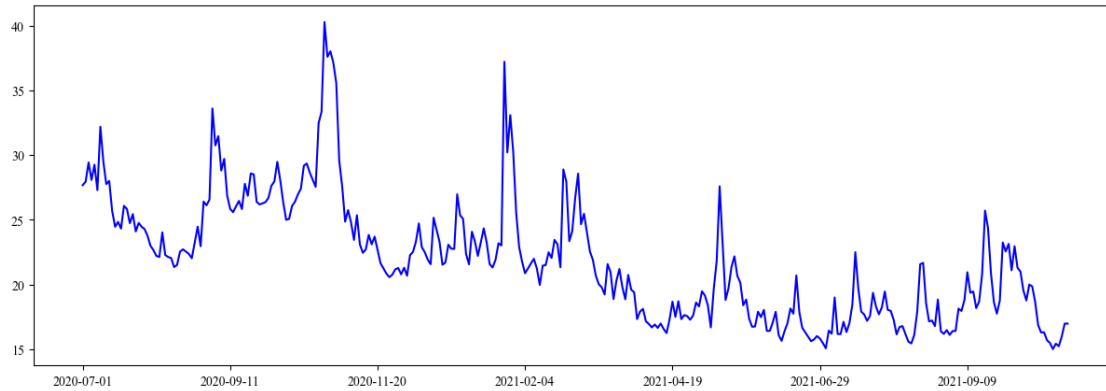
```
[32]:  sns.lineplot(data=df, x="date", y="trade_a2c", label='A2c')
       sns.lineplot(data=df, x="date", y="trade_ddpg", label='DDPG')
       sns.lineplot(data=df, x="date", y="trade_ppo", label='PPO')
       sns.lineplot(data=df, x="date", y="trade_sac", label='SAC')
       sns.lineplot(data=df, x="date", y="trade_vote", label='Voter system')
       plt.xticks(ticks_dates)
       plt.legend()

       plt.savefig('./results/trade.png')
```



```
[33]:  #plt.plot(dates, turbulence_a2c, c='r')
       #plt.plot(dates, turbulence_ddpg, c='b')
       #plt.plot(dates, turbulence_ppo, c='g')
       #plt.plot(dates, turbulence_sac, c='orange')
       plt.plot(dates, turbulence_vote, c='b')
       ticks_dates = list()
       for i in range(len(dates)):
           if i % 50 == 0:
               ticks_dates.append(dates[i])

       plt.xticks(ticks_dates)
       plt.savefig('./results/turbulence.png')
       plt.show()
```

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```
[34]: ddd = zip(cost_a2c, cost_ddpg, cost_ppo, cost_sac, cost_vote, trade_a2c,␣
      ↪trade_ddpg, trade_ppo, trade_sac, trade_vote)
      df = pd.DataFrame(ddd)
      df.columns = ['cost_a2c', 'cost_ddpg', 'cost_ppo', 'cost_sac', 'cost_vote',␣
      ↪'trade_a2c', 'trade_ddpg', 'trade_ppo', 'trade_sac', 'trade_vote']
      df
```
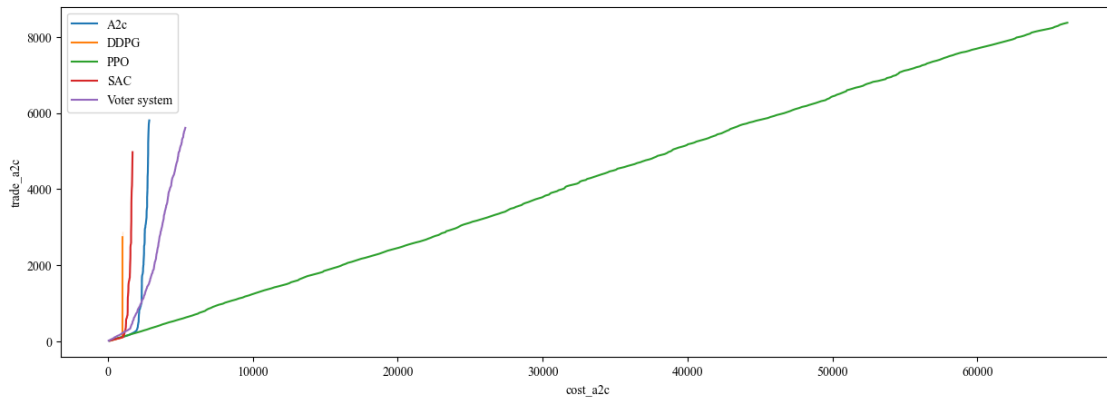
[34]:

	cost_a2c	cost_ddpg	cost_ppo	cost_sac	cost_vote
0	125.303276	149.633932	110.743843	145.979616	44.251478
1	284.391413	299.633603	253.411528	288.639505	128.004358
2	459.697164	451.848013	412.563236	455.233081	227.652016
3	667.216069	602.408298	639.639219	607.148710	314.493045
4	854.341601	753.483849	855.054235	767.388385	397.033263
..	…	…	…	…	…
330	2815.790215	999.000973	65569.849512	1696.200065	5302.868743
331	2815.790215	999.000973	65701.990618	1696.200065	5306.679301
332	2815.790215	999.000973	65942.991620	1696.200065	5327.620105
333	2848.528217	999.000973	66214.483166	1696.200065	5338.191304
334	2848.528217	999.000973	66214.483166	1696.200065	5338.191304

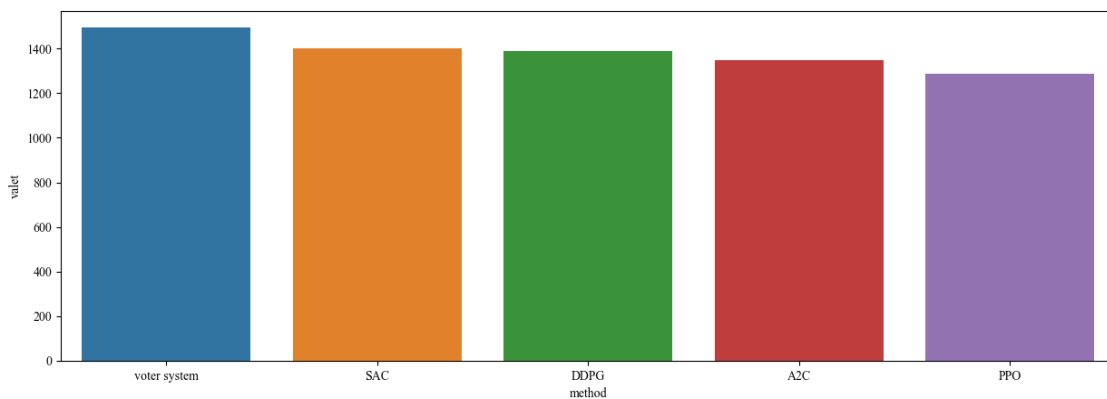|	trade_a2c	trade_ddpg	trade_ppo	trade_sac	trade_vote
0	13	15	15	16	13
1	30	30	34	32	29
2	50	45	56	48	47
3	73	60	79	64	65
4	94	75	102	79	82
..	…	…	…	…	…
330	5757	5289	8294	4947	5561
331	5775	5305	8323	4962	5578
332	5792	5321	8351	4975	5595
333	5809	5337	8377	4990	5613
334	5809	5337	8377	4990	5613

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```
[35]: sns.lineplot(data=df, x="cost_a2c", y="trade_a2c", label='A2c')
      sns.lineplot(data=df, x="cost_ddpg", y="trade_ddpg", label='DDPG')
      sns.lineplot(data=df, x="cost_ppo", y="trade_ppo", label='PPO')
      sns.lineplot(data=df, x="cost_sac", y="trade_sac", label='SAC')
      sns.lineplot(data=df, x="cost_vote", y="trade_vote", label='Voter system')
      plt.legend()

      plt.savefig('./results/cost_trade.png')
```



```
[36]: dd = zip([1495, 1403, 1389, 1347, 1286], ['voter system', 'SAC', 'DDPG', 'A2C',
       ↪'PPO'])
      df = pd.DataFrame(dd)
      df.columns = ['valet', 'method']
      sns.barplot(data=df, x="method", y="valet")
      plt.savefig('./results/barchart.png')
```

[ ]: