C:\Users\guzma\anaconda3\envs\DeepLearningEnv\python.exe C:/Users/guzma/Desktop/ML/Project/DRL-automated-stock-trading/run\_DRL.py

WARNING:tensorflow:

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

For more information, please see:

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

\* https://github.com/tensorflow/addons

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

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

============Start Ensemble Strategy============

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WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\tf\_util.py:191: The name tf.ConfigProto is deprecated. Please use tf.compat.v1.ConfigProto instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\tf\_util.py:200: The name tf.Session is deprecated. Please use tf.compat.v1.Session instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\policies.py:116: The name tf.variable\_scope is deprecated. Please use tf.compat.v1.variable\_scope instead.

======Model training from: 20090000 to 20151002

======DQN Training========

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\input.py:25: The name tf.placeholder is deprecated. Please use tf.compat.v1.placeholder instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\policies.py:561: flatten (from tensorflow.python.layers.core) is deprecated and will be removed in a future version.

Instructions for updating:

Use keras.layers.flatten instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\tensorflow\_core\python\layers\core.py:332: Layer.apply (from tensorflow.python.keras.engine.base\_layer) is deprecated and will be removed in a future version.

Instructions for updating:

Please use `layer.\_\_call\_\_` method instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\tf\_layers.py:123: The name tf.get\_variable is deprecated. Please use tf.compat.v1.get\_variable instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\distributions.py:418: The name tf.random\_normal is deprecated. Please use tf.random.normal instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\tf\_util.py:449: The name tf.get\_collection is deprecated. Please use tf.compat.v1.get\_collection instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\tf\_util.py:449: The name tf.GraphKeys is deprecated. Please use tf.compat.v1.GraphKeys instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\tf\_util.py:407: The name tf.assign is deprecated. Please use tf.compat.v1.assign instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\trpo\_mpi\trpo\_mpi.py:192: The name tf.summary.scalar is deprecated. Please use tf.compat.v1.summary.scalar instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\tf\_util.py:241: The name tf.global\_variables is deprecated. Please use tf.compat.v1.global\_variables instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\tf\_util.py:242: The name tf.variables\_initializer is deprecated. Please use tf.compat.v1.variables\_initializer instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\trpo\_mpi\trpo\_mpi.py:266: The name tf.summary.merge\_all is deprecated. Please use tf.compat.v1.summary.merge\_all instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\trpo\_mpi\trpo\_mpi.py:364: The name tf.RunOptions is deprecated. Please use tf.compat.v1.RunOptions instead.

Training time (DQN): 0.17843225797017415 minutes

======DQN Validation from: 20151002 to 20160104

DQN Sharpe Ratio: 0.0029678753834548755

======A2C Training========

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\tensorflow\_core\python\ops\clip\_ops.py:301: where (from tensorflow.python.ops.array\_ops) is deprecated and will be removed in a future version.

Instructions for updating:

Use tf.where in 2.0, which has the same broadcast rule as np.where

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\a2c\a2c.py:184: The name tf.train.RMSPropOptimizer is deprecated. Please use tf.compat.v1.train.RMSPropOptimizer instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\tensorflow\_core\python\training\rmsprop.py:119: calling Ones.\_\_init\_\_ (from tensorflow.python.ops.init\_ops) with dtype is deprecated and will be removed in a future version.

Instructions for updating:

Call initializer instance with the dtype argument instead of passing it to the constructor

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\a2c\a2c.py:194: The name tf.global\_variables\_initializer is deprecated. Please use tf.compat.v1.global\_variables\_initializer instead.

Training time (A2C): 0.5929067214330037 minutes

======A2C Validation from: 20151002 to 20160104

A2C Sharpe Ratio: -0.23515604027836165

======PPO Training========

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\ppo2\ppo2.py:198: The name tf.trainable\_variables is deprecated. Please use tf.compat.v1.trainable\_variables instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\ppo2\ppo2.py:206: The name tf.train.AdamOptimizer is deprecated. Please use tf.compat.v1.train.AdamOptimizer instead.

Training time (PPO): 1.9866734584172567 minutes

======PPO Validation from: 20151002 to 20160104

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\env\EnvMultipleStock\_validation.py:141: RuntimeWarning: invalid value encountered in double\_scalars

df\_total\_value['daily\_return'].std()

PPO Sharpe Ratio: nan

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\model\models.py:140: RuntimeWarning: invalid value encountered in double\_scalars

df\_total\_value['daily\_return'].std()

======DDPG Training========

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\ddpg\policies.py:136: dense (from tensorflow.python.layers.core) is deprecated and will be removed in a future version.

Instructions for updating:

Use keras.layers.Dense instead.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\common\tf\_util.py:432: The name tf.get\_default\_session is deprecated. Please use tf.compat.v1.get\_default\_session instead.

Training time (DDPG): 0.4702057878176371 minutes

======DDPG Validation from: 20151002 to 20160104

DDPG Sharpe Ratio: -0.23515604027836165

======Trading from: 20160104 to 20160405

previous\_total\_asset:1000000

end\_total\_asset:1002952.4380035641

total\_reward:2952.438003564137

total\_cost: 150.94877765268208

total trades: 56

Sharpe: 0.35806512223704484

============================================

======Model training from: 20090000 to 20160104

======DQN Training========

Training time (DQN): 0.2015701413154602 minutes

======DQN Validation from: 20160104 to 20160405

DQN Sharpe Ratio: 0.35958971188819755

======A2C Training========

Training time (A2C): 0.6216889421145121 minutes

======A2C Validation from: 20160104 to 20160405

A2C Sharpe Ratio: 0.17270986502186206

======PPO Training========

Training time (PPO): 2.1332164486249288 minutes

======PPO Validation from: 20160104 to 20160405

PPO Sharpe Ratio: 0.22075132458167224

======DDPG Training========

Training time (DDPG): 0.4845757762591044 minutes

======DDPG Validation from: 20160104 to 20160405

DDPG Sharpe Ratio: 0.18701264674252227

======Trading from: 20160405 to 20160705

previous\_total\_asset:1002952.4380035641

end\_total\_asset:1004152.6373260812

total\_reward:1200.19932251703

total\_cost: 236.09807168273815

total trades: 62

Sharpe: 0.19120528402888962

============================================

======Model training from: 20090000 to 20160405

======DQN Training========

Training time (DQN): 0.19427676598230997 minutes

======DQN Validation from: 20160405 to 20160705

DQN Sharpe Ratio: -0.1407261214593365

======A2C Training========

Training time (A2C): 0.6529077529907227 minutes

======A2C Validation from: 20160405 to 20160705

A2C Sharpe Ratio: -0.13622437840425075

======PPO Training========

Training time (PPO): 2.226605200767517 minutes

======PPO Validation from: 20160405 to 20160705

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\env\EnvMultipleStock\_validation.py:141: RuntimeWarning: invalid value encountered in double\_scalars

df\_total\_value['daily\_return'].std()

PPO Sharpe Ratio: nan

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\model\models.py:140: RuntimeWarning: invalid value encountered in double\_scalars

======DDPG Training========

df\_total\_value['daily\_return'].std()

Training time (DDPG): 0.5037825385729472 minutes

======DDPG Validation from: 20160405 to 20160705

DDPG Sharpe Ratio: -0.12855255597666665

======Trading from: 20160705 to 20161003

previous\_total\_asset:1004152.6373260812

end\_total\_asset:1003213.9265246162

total\_reward:-938.7108014649712

total\_cost: 233.8086916604698

total trades: 62

Sharpe: -0.050849304636318815

============================================

======Model training from: 20090000 to 20160705

======DQN Training========

Training time (DQN): 0.2012814442316691 minutes

======DQN Validation from: 20160705 to 20161003

DQN Sharpe Ratio: -0.09802068877523257

======A2C Training========

Training time (A2C): 0.6211636900901795 minutes

======A2C Validation from: 20160705 to 20161003

A2C Sharpe Ratio: 0.032839655989803894

======PPO Training========

Training time (PPO): 2.0939403732617694 minutes

======PPO Validation from: 20160705 to 20161003

PPO Sharpe Ratio: -0.29330979769854065

======DDPG Training========

Training time (DDPG): 0.46781205336252846 minutes

======DDPG Validation from: 20160705 to 20161003

DDPG Sharpe Ratio: -0.027224696425768795

======Trading from: 20161003 to 20170103

previous\_total\_asset:1003213.9265246162

end\_total\_asset:1024469.1808799611

total\_reward:21255.25435534492

total\_cost: 379.735547260704

total trades: 62

Sharpe: 0.3370366038532698

============================================

======Model training from: 20090000 to 20161003

======DQN Training========

Training time (DQN): 0.20141283671061197 minutes

======DQN Validation from: 20161003 to 20170103

DQN Sharpe Ratio: 0.38411947539998953

======A2C Training========

Training time (A2C): 0.6244154413541158 minutes

======A2C Validation from: 20161003 to 20170103

A2C Sharpe Ratio: 0.07706597838548704

======PPO Training========

Training time (PPO): 2.1201256116231284 minutes

======PPO Validation from: 20161003 to 20170103

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\env\EnvMultipleStock\_validation.py:141: RuntimeWarning: invalid value encountered in double\_scalars

df\_total\_value['daily\_return'].std()

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\model\models.py:140: RuntimeWarning: invalid value encountered in double\_scalars

df\_total\_value['daily\_return'].std()

PPO Sharpe Ratio: nan

======DDPG Training========

Training time (DDPG): 0.4796595851580302 minutes

======DDPG Validation from: 20161003 to 20170103

DDPG Sharpe Ratio: 0.37983415228097567

======Trading from: 20170103 to 20170404

previous\_total\_asset:1024469.1808799611

end\_total\_asset:1040672.1083385972

total\_reward:16202.927458636113

total\_cost: 325.00767263714795

total trades: 62

Sharpe: 0.20798703088654832

============================================

======Model training from: 20090000 to 20170103

======DQN Training========

Training time (DQN): 0.2018956224123637 minutes

======DQN Validation from: 20170103 to 20170404

DQN Sharpe Ratio: 0.122075877457151

======A2C Training========

Training time (A2C): 0.6355859359105428 minutes

======A2C Validation from: 20170103 to 20170404

A2C Sharpe Ratio: 0.027082457892153283

======PPO Training========

Training time (PPO): 2.1222347617149353 minutes

======PPO Validation from: 20170103 to 20170404

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\env\EnvMultipleStock\_validation.py:141: RuntimeWarning: invalid value encountered in double\_scalars

df\_total\_value['daily\_return'].std()

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\model\models.py:140: RuntimeWarning: invalid value encountered in double\_scalars

df\_total\_value['daily\_return'].std()

PPO Sharpe Ratio: nan

======DDPG Training========

Training time (DDPG): 0.4733699878056844 minutes

======DDPG Validation from: 20170103 to 20170404

DDPG Sharpe Ratio: 0.030945015859846596

======Trading from: 20170404 to 20170705

previous\_total\_asset:1040672.1083385972

end\_total\_asset:1071968.996624643

total\_reward:31296.888286045752

total\_cost: 278.4538276152373

total trades: 62

Sharpe: 0.27721491538721577

============================================

======Model training from: 20090000 to 20170404

======DQN Training========

Training time (DQN): 0.1968531886736552 minutes

======DQN Validation from: 20170404 to 20170705

DQN Sharpe Ratio: 0.49788947160931973

======A2C Training========

Training time (A2C): 0.6234265724817912 minutes

======A2C Validation from: 20170404 to 20170705

A2C Sharpe Ratio: 0.04250132838227926

======PPO Training========

Training time (PPO): 2.0925903717676797 minutes

======PPO Validation from: 20170404 to 20170705

PPO Sharpe Ratio: 0.5953046134135428

======DDPG Training========

Training time (DDPG): 0.4808799068133036 minutes

======DDPG Validation from: 20170404 to 20170705

DDPG Sharpe Ratio: 0.5846121426479529

======Trading from: 20170705 to 20171003

previous\_total\_asset:1071968.996624643

end\_total\_asset:1125065.0282184144

total\_reward:53096.03159377142

total\_cost: 505.75259108467094

total trades: 62

Sharpe: 0.3467282037957876

============================================

======Model training from: 20090000 to 20170705

======DQN Training========

Training time (DQN): 0.1963471253712972 minutes

======DQN Validation from: 20170705 to 20171003

DQN Sharpe Ratio: 0.42672450871016643

======A2C Training========

Training time (A2C): 0.6718150496482849 minutes

======A2C Validation from: 20170705 to 20171003

A2C Sharpe Ratio: 0.4101543005230706

======PPO Training========

Training time (PPO): 2.093967405954997 minutes

======PPO Validation from: 20170705 to 20171003

PPO Sharpe Ratio: 0.39213612857059876

======DDPG Training========

Training time (DDPG): 0.44520445267359415 minutes

======DDPG Validation from: 20170705 to 20171003

DDPG Sharpe Ratio: 0.41015499284982365

======Trading from: 20171003 to 20180103

previous\_total\_asset:1125065.0282184144

end\_total\_asset:1218150.275069845

total\_reward:93085.24685143051

total\_cost: 369.8649343724538

total trades: 62

Sharpe: 0.3935752473240866

============================================

======Model training from: 20090000 to 20171003

======DQN Training========

Training time (DQN): 0.18117148876190187 minutes

======DQN Validation from: 20171003 to 20180103

DQN Sharpe Ratio: 0.2527231080079946

======A2C Training========

Training time (A2C): 0.5708369612693787 minutes

======A2C Validation from: 20171003 to 20180103

A2C Sharpe Ratio: -0.12237404988050687

======PPO Training========

Training time (PPO): 1.9585201144218445 minutes

======PPO Validation from: 20171003 to 20180103

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\env\EnvMultipleStock\_validation.py:141: RuntimeWarning: invalid value encountered in double\_scalars

df\_total\_value['daily\_return'].std()

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\model\models.py:140: RuntimeWarning: invalid value encountered in double\_scalars

PPO Sharpe Ratio: nan

df\_total\_value['daily\_return'].std()

======DDPG Training========

Training time (DDPG): 0.4394277056058248 minutes

======DDPG Validation from: 20171003 to 20180103

DDPG Sharpe Ratio: 0.2806046321644876

======Trading from: 20180103 to 20180405

previous\_total\_asset:1218150.275069845

end\_total\_asset:1154572.588972612

total\_reward:-63577.68609723286

total\_cost: 378.8354424553858

total trades: 62

Sharpe: -0.08251583750277125

============================================

======Model training from: 20090000 to 20180103

======DQN Training========

Training time (DQN): 0.178536057472229 minutes

======DQN Validation from: 20180103 to 20180405

DQN Sharpe Ratio: -0.12614813790969123

======A2C Training========

Training time (A2C): 0.5794614473978679 minutes

======A2C Validation from: 20180103 to 20180405

A2C Sharpe Ratio: -0.17842596511406683

======PPO Training========

Training time (PPO): 1.976155706246694 minutes

======PPO Validation from: 20180103 to 20180405

PPO Sharpe Ratio: -0.09951113968697514

======DDPG Training========

Training time (DDPG): 0.44091949462890623 minutes

======DDPG Validation from: 20180103 to 20180405

DDPG Sharpe Ratio: -0.09950105568815296

======Trading from: 20180405 to 20180705

previous\_total\_asset:1154572.588972612

end\_total\_asset:1207561.7039992823

total\_reward:52989.115026670275

total\_cost: 44.0866

total trades: 62

Sharpe: 0.11771583967719601

============================================

======Model training from: 20090000 to 20180405

======DQN Training========

Training time (DQN): 0.17991891304651897 minutes

======DQN Validation from: 20180405 to 20180705

DQN Sharpe Ratio: 0.011646269249017136

======A2C Training========

Training time (A2C): 0.6034270405769349 minutes

======A2C Validation from: 20180405 to 20180705

A2C Sharpe Ratio: -0.04169069614043609

======PPO Training========

Training time (PPO): 2.081926492849986 minutes

======PPO Validation from: 20180405 to 20180705

PPO Sharpe Ratio: -0.04042782859397424

======DDPG Training========

Training time (DDPG): 0.49730751117070515 minutes

======DDPG Validation from: 20180405 to 20180705

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\env\EnvMultipleStock\_validation.py:141: RuntimeWarning: invalid value encountered in double\_scalars

df\_total\_value['daily\_return'].std()

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\model\models.py:140: RuntimeWarning: invalid value encountered in double\_scalars

df\_total\_value['daily\_return'].std()

DDPG Sharpe Ratio: nan

======Trading from: 20180705 to 20181003

previous\_total\_asset:1207561.7039992823

end\_total\_asset:1337086.5519826848

total\_reward:129524.84798340243

total\_cost: 248.99970417504287

total trades: 62

Sharpe: 0.3604617492601892

============================================

======Model training from: 20090000 to 20180705

======DQN Training========

Training time (DQN): 0.2060546080271403 minutes

======DQN Validation from: 20180705 to 20181003

DQN Sharpe Ratio: 0.2689076906581037

======A2C Training========

Training time (A2C): 0.628182037671407 minutes

======A2C Validation from: 20180705 to 20181003

A2C Sharpe Ratio: 0.2512961453116029

======PPO Training========

Training time (PPO): 2.0117109219233194 minutes

======PPO Validation from: 20180705 to 20181003

PPO Sharpe Ratio: 0.24985120277369546

======DDPG Training========

Training time (DDPG): 0.4481420874595642 minutes

======DDPG Validation from: 20180705 to 20181003

DDPG Sharpe Ratio: 0.2468424218872872

======Trading from: 20181003 to 20190104

previous\_total\_asset:1337086.5519826848

end\_total\_asset:1152232.7099535882

total\_reward:-184853.84202909656

total\_cost: 280.22559536767363

total trades: 62

Sharpe: -0.24401912682422233

============================================

======Model training from: 20090000 to 20181003

======DQN Training========

Training time (DQN): 0.19146792888641356 minutes

======DQN Validation from: 20181003 to 20190104

DQN Sharpe Ratio: -0.30740886402569906

======A2C Training========

Training time (A2C): 0.5836580038070679 minutes

======A2C Validation from: 20181003 to 20190104

A2C Sharpe Ratio: -0.12492595983898928

======PPO Training========

Training time (PPO): 2.0108359853426614 minutes

======PPO Validation from: 20181003 to 20190104

PPO Sharpe Ratio: -0.2823115717096348

======DDPG Training========

Training time (DDPG): 0.44871447086334226 minutes

======DDPG Validation from: 20181003 to 20190104

DDPG Sharpe Ratio: -0.27454199624068476

======Trading from: 20190104 to 20190405

previous\_total\_asset:1152232.7099535882

end\_total\_asset:1343762.0338326339

total\_reward:191529.32387904567

total\_cost: 561.4493902672577

total trades: 62

Sharpe: 0.5361733486585606

============================================

======Model training from: 20090000 to 20190104

======DQN Training========

Training time (DQN): 0.18643352190653484 minutes

======DQN Validation from: 20190104 to 20190405

DQN Sharpe Ratio: 0.26797705735745214

======A2C Training========

Training time (A2C): 0.5925276160240174 minutes

======A2C Validation from: 20190104 to 20190405

A2C Sharpe Ratio: 0.2700454191811065

======PPO Training========

Training time (PPO): 2.0187294085820517 minutes

======PPO Validation from: 20190104 to 20190405

PPO Sharpe Ratio: 0.24154526388178613

======DDPG Training========

Training time (DDPG): 0.467587947845459 minutes

======DDPG Validation from: 20190104 to 20190405

DDPG Sharpe Ratio: 0.2407026577509669

======Trading from: 20190405 to 20190708

previous\_total\_asset:1343762.0338326339

end\_total\_asset:1501227.1804516301

total\_reward:157465.14661899628

total\_cost: 693.4861425880812

total trades: 62

Sharpe: 0.45572891578964847

============================================

======Model training from: 20090000 to 20190405

======DQN Training========

Training time (DQN): 0.18641111850738526 minutes

======DQN Validation from: 20190405 to 20190708

DQN Sharpe Ratio: 0.15191206437444704

======A2C Training========

Training time (A2C): 0.5846233487129211 minutes

======A2C Validation from: 20190405 to 20190708

A2C Sharpe Ratio: 0.34919487929261916

======PPO Training========

Training time (PPO): 2.0168021996816 minutes

======PPO Validation from: 20190405 to 20190708

PPO Sharpe Ratio: 0.37357586265730985

======DDPG Training========

Training time (DDPG): 0.47899829943974814 minutes

======DDPG Validation from: 20190405 to 20190708

DDPG Sharpe Ratio: 0.37602076894992514

======Trading from: 20190708 to 20191004

previous\_total\_asset:1501227.1804516301

end\_total\_asset:1345716.64422561

total\_reward:-155510.5362260202

total\_cost: 283.1162882732392

total trades: 62

Sharpe: -0.2557914042569877

============================================

======Model training from: 20090000 to 20190708

======DQN Training========

Training time (DQN): 0.1871240774790446 minutes

======DQN Validation from: 20190708 to 20191004

DQN Sharpe Ratio: -0.1826705061457387

======A2C Training========

Training time (A2C): 0.6109095613161722 minutes

======A2C Validation from: 20190708 to 20191004

A2C Sharpe Ratio: -0.33976674884415786

======PPO Training========

Training time (PPO): 2.2097762982050577 minutes

======PPO Validation from: 20190708 to 20191004

PPO Sharpe Ratio: -0.36039185329635093

======DDPG Training========

Training time (DDPG): 0.504293684164683 minutes

======DDPG Validation from: 20190708 to 20191004

DDPG Sharpe Ratio: -0.33884752570083015

======Trading from: 20191004 to 20200106

previous\_total\_asset:1345716.64422561

end\_total\_asset:1488847.7497607444

total\_reward:143131.10553513444

total\_cost: 211.3283934607077

total trades: 62

Sharpe: 0.3498572510307635

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======Model training from: 20090000 to 20191004

======DQN Training========

Training time (DQN): 0.19523208538691203 minutes

======DQN Validation from: 20191004 to 20200106

DQN Sharpe Ratio: 0.23627139958041876

======A2C Training========

Training time (A2C): 0.6092158476511638 minutes

======A2C Validation from: 20191004 to 20200106

A2C Sharpe Ratio: 0.2357046410637114

======PPO Training========

Training time (PPO): 2.1155189434687296 minutes

======PPO Validation from: 20191004 to 20200106

PPO Sharpe Ratio: 0.22705775892142974

======DDPG Training========

Training time (DDPG): 0.4834764122962952 minutes

======DDPG Validation from: 20191004 to 20200106

DDPG Sharpe Ratio: 0.23378450989840935

======Trading from: 20200106 to 20200406

previous\_total\_asset:1488847.7497607444

end\_total\_asset:910320.2373710168

total\_reward:-578527.5123897276

total\_cost: 437.56237124596475

total trades: 62

Sharpe: -0.23626215913355056

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======Model training from: 20090000 to 20200106

======DQN Training========

Training time (DQN): 0.19864355325698851 minutes

======DQN Validation from: 20200106 to 20200406

DQN Sharpe Ratio: -0.3391203953659328

======A2C Training========

Training time (A2C): 0.6266255815823872 minutes

======A2C Validation from: 20200106 to 20200406

A2C Sharpe Ratio: -0.05698235161499128

======PPO Training========

Training time (PPO): 2.1245684146881105 minutes

======PPO Validation from: 20200106 to 20200406

PPO Sharpe Ratio: -0.30963206293565215

======DDPG Training========

Training time (DDPG): 0.523381769657135 minutes

======DDPG Validation from: 20200106 to 20200406

DDPG Sharpe Ratio: -0.2870093144222682

======Trading from: 20200406 to 20200707

previous\_total\_asset:910320.2373710168

end\_total\_asset:1157780.7483688446

total\_reward:247460.51099782786

total\_cost: 536.8871492971421

total trades: 62

Sharpe: 0.24072189948387163

Ensemble Strategy took: 60.66591486533483 minutes

Process finished with exit code 0