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

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

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.

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): 0.17363107204437256 minutes

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

DQN Sharpe Ratio: -0.17689603885740737

======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): 0.5345794677734375 minutes

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

A2C Sharpe Ratio: -0.0058537360642125485

======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): 2.0881836573282877 minutes

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

PPO Sharpe Ratio: -0.2369401445576807

======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): 0.4419329047203064 minutes

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

DDPG Sharpe Ratio: -0.23515604027836165

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

previous\_total\_asset:1000000

end\_total\_asset:998882.2932969894

total\_reward:-1117.7067030105973

total\_cost: 169.53917609018328

total trades: 42

Sharpe: -0.1737410201995004

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

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

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

Training time (DQN): 0.22922256787618 minutes

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

DQN Sharpe Ratio: 0.4385475897440074

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

Training time (A2C): 0.6890350500742595 minutes

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

A2C Sharpe Ratio: 0.3770412592252781

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

Training time (PPO): 2.731283787886302 minutes

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

PPO Sharpe Ratio: 0.1871524628494964

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

Training time (DDPG): 0.4537190079689026 minutes

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

DDPG Sharpe Ratio: 0.18701260026809816

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

previous\_total\_asset:998882.2932969894

end\_total\_asset:996396.7123351819

total\_reward:-2485.5809618075145

total\_cost: 202.0241028971791

total trades: 62

Sharpe: -0.14814779373229167

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

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

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

Training time (DQN): 0.19547422329584757 minutes

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

DQN Sharpe Ratio: 0.5197959472973902

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

Training time (A2C): 0.6113462567329406 minutes

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

A2C Sharpe Ratio: 0.11562184928187041

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

Training time (PPO): 2.6137613534927366 minutes

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

PPO Sharpe Ratio: -0.11962806920148163

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

Training time (DDPG): 0.5210813283920288 minutes

======DDPG 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()

DDPG Sharpe Ratio: nan

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

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()

previous\_total\_asset:996396.7123351819

end\_total\_asset:1001364.2757831479

total\_reward:4967.5634479660075

total\_cost: 243.97664775932907

total trades: 62

Sharpe: 0.35999597685029455

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

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

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

Training time (DQN): 0.2240511218706767 minutes

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

DQN Sharpe Ratio: 0.0038027791163294604

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

Training time (A2C): 0.6171083410580953 minutes

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

A2C Sharpe Ratio: -0.05746550841344833

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

Training time (PPO): 2.5773592352867127 minutes

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

PPO Sharpe Ratio: -0.04108376734183562

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

Training time (DDPG): 0.5434705177942912 minutes

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

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: 20161003 to 20170103

previous\_total\_asset:1001364.2757831479

end\_total\_asset:1008054.6953599928

total\_reward:6690.419576844899

total\_cost: 260.5556681328559

total trades: 62

Sharpe: 0.3682862820615055

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

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

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

Training time (DQN): 0.24468193451563516 minutes

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

DQN Sharpe Ratio: 0.21364311581228873

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

Training time (A2C): 0.6635050535202026 minutes

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

A2C Sharpe Ratio: 0.22907836051842728

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

Training time (PPO): 2.5016795357068378 minutes

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

PPO Sharpe Ratio: 0.3932062973580231

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

Training time (DDPG): 0.6231756766637166 minutes

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

DDPG Sharpe Ratio: 0.3798305895349013

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

previous\_total\_asset:1008054.6953599928

end\_total\_asset:1014519.7768631724

total\_reward:6465.081503179623

total\_cost: 446.4119904320526

total trades: 62

Sharpe: 0.08143018677450398

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

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

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

Training time (DQN): 0.21211454073588054 minutes

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

DQN Sharpe Ratio: -0.010035690044905538

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

Training time (A2C): 0.6866229057312012 minutes

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

A2C Sharpe Ratio: 0.189701779037119

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

Training time (PPO): 2.481039543946584 minutes

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

PPO Sharpe Ratio: 0.030832125212626148

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

Training time (DDPG): 0.5063217997550964 minutes

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

DDPG Sharpe Ratio: 0.03094686368240967

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

previous\_total\_asset:1014519.7768631724

end\_total\_asset:1041337.6387060207

total\_reward:26817.861842848244

total\_cost: 396.2933459811496

total trades: 62

Sharpe: 0.19677949920693463

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

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

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

Training time (DQN): 0.3096606254577637 minutes

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

DQN Sharpe Ratio: 0.433992052328436

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

Training time (A2C): 0.7156566023826599 minutes

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

A2C Sharpe Ratio: 0.5762185548260234

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

Training time (PPO): 2.818936840693156 minutes

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

PPO Sharpe Ratio: 0.5780992861121902

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

Training time (DDPG): 0.5268407543500264 minutes

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

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: 20170705 to 20171003

previous\_total\_asset:1041337.6387060207

end\_total\_asset:1060367.3473109493

total\_reward:19029.708604928688

total\_cost: 316.1316313970899

total trades: 62

Sharpe: 0.2736461824473309

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

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

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

Training time (DQN): 0.19783066511154174 minutes

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

DQN Sharpe Ratio: 0.3375791589977289

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

Training time (A2C): 0.641263480981191 minutes

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

A2C Sharpe Ratio: -0.1646692058889585

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

Training time (PPO): 2.3231744607289633 minutes

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

PPO Sharpe Ratio: 0.4045103744679224

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

Training time (DDPG): 0.5038757403691609 minutes

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

DDPG Sharpe Ratio: 0.4101543048457358

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

previous\_total\_asset:1060367.3473109493

end\_total\_asset:1112893.3727414499

total\_reward:52526.02543050051

total\_cost: 590.9447538256835

total trades: 62

Sharpe: 0.34826906869829816

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

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

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

Training time (DQN): 0.22224829196929932 minutes

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

DQN Sharpe Ratio: 0.27120902735931707

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

Training time (A2C): 0.6479194680849711 minutes

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

A2C Sharpe Ratio: 0.2862956004168728

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

Training time (PPO): 2.177888786792755 minutes

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

PPO Sharpe Ratio: 0.28060463277315073

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

Training time (DDPG): 0.4332749565442403 minutes

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

DDPG Sharpe Ratio: 0.2806039481882416

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

previous\_total\_asset:1112893.3727414499

end\_total\_asset:1057375.3552781306

total\_reward:-55518.01746331924

total\_cost: 558.926080815754

total trades: 62

Sharpe: -0.0850567022629698

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

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

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

Training time (DQN): 0.17934609651565553 minutes

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

DQN Sharpe Ratio: -0.0996451722238985

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

Training time (A2C): 0.5508508642514547 minutes

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

A2C Sharpe Ratio: -0.22479733419769254

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

Training time (PPO): 1.9252345244089761 minutes

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

PPO Sharpe Ratio: -0.11071642626243511

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

Training time (DDPG): 0.4186347643534342 minutes

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

DDPG Sharpe Ratio: -0.09950106123375634

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

previous\_total\_asset:1057375.3552781306

end\_total\_asset:1102641.7556819168

total\_reward:45266.40040378622

total\_cost: 133.90122787422177

total trades: 62

Sharpe: 0.11320315592903481

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

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

Training time (DQN): 0.17532656590143839 minutes

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

DQN Sharpe Ratio: 0.012564600903388

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

Training time (A2C): 0.7566286047299703 minutes

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

A2C Sharpe Ratio: -0.056944714314697595

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

Training time (PPO): 1.9416993260383606 minutes

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

PPO Sharpe Ratio: -0.04202316055189566

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

Training time (DDPG): 0.4352449735005697 minutes

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

DDPG Sharpe Ratio: -0.042401515541481874

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

previous\_total\_asset:1102641.7556819168

end\_total\_asset:1220538.6249402002

total\_reward:117896.8692582834

total\_cost: 376.7196802555991

total trades: 62

Sharpe: 0.36066343451398847

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

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

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

Training time (DQN): 0.17783524990081787 minutes

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

DQN Sharpe Ratio: 0.008273827360121227

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

Training time (A2C): 0.547260061899821 minutes

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

A2C Sharpe Ratio: 0.27490568080777705

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

Training time (PPO): 1.9156265576680502 minutes

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

PPO Sharpe Ratio: 0.2546162874877419

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

Training time (DDPG): 0.4331798354784648 minutes

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

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: 20181003 to 20190104

previous\_total\_asset:1220538.6249402002

end\_total\_asset:1077963.0676221647

total\_reward:-142575.5573180355

total\_cost: 532.2179894699765

total trades: 62

Sharpe: -0.24591683539581424

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

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

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

Training time (DQN): 0.17776127258936564 minutes

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

DQN Sharpe Ratio: -0.30672212424195255

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

Training time (A2C): 0.5433452447255452 minutes

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

A2C Sharpe Ratio: -0.27706344799717425

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

Training time (PPO): 1.9163431207338968 minutes

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

PPO Sharpe Ratio: -0.2913713939637733

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

Training time (DDPG): 0.4233565251032511 minutes

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

DDPG Sharpe Ratio: -0.27454201207318485

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

previous\_total\_asset:1077963.0676221647

end\_total\_asset:1241279.8416147623

total\_reward:163316.7739925976

total\_cost: 302.83145857383727

total trades: 62

Sharpe: 0.5251665957381231

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

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

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

Training time (DQN): 0.17733668088912963 minutes

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

DQN Sharpe Ratio: 0.22389969913052907

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

Training time (A2C): 0.5618355631828308 minutes

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

A2C Sharpe Ratio: 0.2443156262530223

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

Training time (PPO): 1.9136118094126384 minutes

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

PPO Sharpe Ratio: 0.24170166947980729

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

Training time (DDPG): 0.42723026672999065 minutes

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

DDPG Sharpe Ratio: 0.2407026577509669

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

previous\_total\_asset:1241279.8416147623

end\_total\_asset:1411195.708931587

total\_reward:169915.86731682462

total\_cost: 538.9121818956326

total trades: 62

Sharpe: 0.4515063001790577

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

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

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

Training time (DQN): 0.17537029584248862 minutes

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

DQN Sharpe Ratio: 0.5565819597487183

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

Training time (A2C): 0.5431513071060181 minutes

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

A2C Sharpe Ratio: 0.3868922317916582

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

Training time (PPO): 1.8959503213564555 minutes

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

PPO Sharpe Ratio: 0.3904655145981978

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

Training time (DDPG): 0.4242876410484314 minutes

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

DDPG Sharpe Ratio: 0.37602078099913255

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

previous\_total\_asset:1411195.708931587

end\_total\_asset:1267531.16834272

total\_reward:-143664.54058886692

total\_cost: 351.81315552268626

total trades: 62

Sharpe: -0.24822947954989635

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

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

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

Training time (DQN): 0.17662384510040283 minutes

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

DQN Sharpe Ratio: -0.287564302168722

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

Training time (A2C): 0.5588348627090454 minutes

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

A2C Sharpe Ratio: -0.3046463985670612

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

Training time (PPO): 1.8722222844759624 minutes

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

PPO Sharpe Ratio: -0.1538919012107181

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

Training time (DDPG): 0.4275987346967061 minutes

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

DDPG Sharpe Ratio: -0.33884549395874036

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

previous\_total\_asset:1267531.16834272

end\_total\_asset:1385749.8567664833

total\_reward:118218.68842376326

total\_cost: 561.2653087055968

total trades: 62

Sharpe: 0.3561244520042774

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

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

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

Training time (DQN): 0.17657771507898967 minutes

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

DQN Sharpe Ratio: -0.09371816472821466

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

Training time (A2C): 0.545757015546163 minutes

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

A2C Sharpe Ratio: 0.23094213862262164

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

Training time (PPO): 1.9225865046183268 minutes

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

PPO Sharpe Ratio: 0.24339047087116392

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

Training time (DDPG): 0.4375200867652893 minutes

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

DDPG Sharpe Ratio: 0.235601628051179

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

previous\_total\_asset:1385749.8567664833

end\_total\_asset:935659.8558022329

total\_reward:-450090.0009642504

total\_cost: 525.4259362457656

total trades: 62

Sharpe: -0.24980764312792395

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

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

Training time (DQN): 0.1758492112159729 minutes

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

DQN Sharpe Ratio: -0.3466286292778728

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

Training time (A2C): 0.5501811822255452 minutes

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

A2C Sharpe Ratio: -0.30104815050626565

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

Training time (PPO): 1.9233888824780783 minutes

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

PPO Sharpe Ratio: -0.28735007806211754

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

Training time (DDPG): 0.4353259841601054 minutes

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

DDPG Sharpe Ratio: -0.331523436293983

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

previous\_total\_asset:935659.8558022329

end\_total\_asset:1177419.116073247

total\_reward:241759.26027101418

total\_cost: 509.957436281204

total trades: 62

Sharpe: 0.2249789786983006

Ensemble Strategy took: 62.78476209640503 minutes

Process finished with exit code 0