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

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

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.

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

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

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\a2c\a2c.py:160: 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: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\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.

WARNING:tensorflow:From C:\Users\guzma\anaconda3\envs\DeepLearningEnv\lib\site-packages\stable\_baselines\a2c\a2c.py:196: The name tf.summary.merge\_all is deprecated. Please use tf.compat.v1.summary.merge\_all instead.

Training time (A2C): 0.7178145368893941 minutes

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

A2C Sharpe Ratio: -0.2457813344097501

======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): 2.345377178986867 minutes

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

PPO Sharpe Ratio: -0.23142090891531458

======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\ddpg\ddpg.py:94: 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\ddpg\ddpg.py:444: 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:432: The name tf.get\_default\_session is deprecated. Please use tf.compat.v1.get\_default\_session instead.

Training time (DDPG): 0.45946808258692423 minutes

======DDPG 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()

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

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\model\models.py:126: RuntimeWarning: invalid value encountered in double\_scalars

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

previous\_total\_asset:1000000

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\env\EnvMultipleStock\_trade.py:143: RuntimeWarning: invalid value encountered in double\_scalars

end\_total\_asset:1000000.0

total\_reward:0.0

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

total\_cost: 0

total trades: 0

Sharpe: nan

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

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

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

Training time (A2C): 0.6567226489384969 minutes

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

A2C Sharpe Ratio: 0.1540763834715858

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

Training time (PPO): 2.4333816448847454 minutes

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

PPO Sharpe Ratio: 0.18984742729040915

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

Training time (DDPG): 0.4779849727948507 minutes

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

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

previous\_total\_asset:1000000.0

end\_total\_asset:984592.6327052179

total\_reward:-15407.367294782074

total\_cost: 361.37034300173764

total trades: 62

Sharpe: -0.12604120821870463

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

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

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

Training time (A2C): 1.3456812540690104 minutes

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

A2C Sharpe Ratio: -0.12934288240013914

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

Training time (PPO): 2.61725382010142 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

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

C:\Users\guzma\Desktop\ML\Project\DRL-automated-stock-trading\model\models.py:126: RuntimeWarning: invalid value encountered in double\_scalars

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

Training time (DDPG): 0.6547475457191467 minutes

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

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

previous\_total\_asset:984592.6327052179

end\_total\_asset:1001516.9858464362

total\_reward:16924.353141218307

total\_cost: 398.6701372856141

total trades: 62

Sharpe: 0.10603518414364083

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

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

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

Training time (A2C): 0.8477052489916483 minutes

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

A2C Sharpe Ratio: 0.04991173527741105

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

Training time (PPO): 2.6776603937149046 minutes

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

PPO Sharpe Ratio: -0.048517401411219366

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

Training time (DDPG): 0.5523236393928528 minutes

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

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

previous\_total\_asset:1001516.9858464362

end\_total\_asset:1122015.4983464347

total\_reward:120498.51249999844

total\_cost: 366.58651809840205

total trades: 62

Sharpe: 0.31328377672012137

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

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

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

Training time (A2C): 1.0061424414316813 minutes

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

A2C Sharpe Ratio: 0.39082132095572036

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

Training time (PPO): 3.0177155335744223 minutes

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

PPO Sharpe Ratio: 0.3614323485980864

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

Training time (DDPG): 0.6107404152552287 minutes

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

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

previous\_total\_asset:1122015.4983464347

end\_total\_asset:1182864.903352257

total\_reward:60849.405005822424

total\_cost: 195.01674695465087

total trades: 62

Sharpe: 0.2138897068839361

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

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

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

Training time (A2C): 0.7532211899757385 minutes

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

A2C Sharpe Ratio: 0.03058485473387861

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

Training time (PPO): 2.563594059149424 minutes

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

PPO Sharpe Ratio: 0.03094686368240967

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

Training time (DDPG): 0.46192291180292766 minutes

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

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

previous\_total\_asset:1182864.903352257

end\_total\_asset:1280845.8551395189

total\_reward:97980.95178726176

total\_cost: 0.0

total trades: 62

Sharpe: 0.2597111659303674

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

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

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

Training time (A2C): 0.6328709642092387 minutes

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

A2C Sharpe Ratio: 0.3325752090004281

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

Training time (PPO): 2.2115741928418475 minutes

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

PPO Sharpe Ratio: 0.5738336411694777

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

Training time (DDPG): 0.44243969917297366 minutes

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

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

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:126: RuntimeWarning: invalid value encountered in double\_scalars

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

previous\_total\_asset:1280845.8551395189

end\_total\_asset:1333785.5077263077

total\_reward:52939.65258678887

total\_cost: 532.9238489873503

total trades: 62

Sharpe: 0.23000653007984836

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

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

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

Training time (A2C): 0.6251665234565735 minutes

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

A2C Sharpe Ratio: 0.40421167599964025

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

Training time (PPO): 2.0711651762326557 minutes

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

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:126: RuntimeWarning: invalid value encountered in double\_scalars

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

PPO Sharpe Ratio: nan

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

Training time (DDPG): 0.4596319238344828 minutes

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

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

previous\_total\_asset:1333785.5077263077

end\_total\_asset:1430114.6789980377

total\_reward:96329.17127172998

total\_cost: 531.8435118241118

total trades: 62

Sharpe: 0.3731073007417675

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

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

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

Training time (A2C): 0.6306800087292989 minutes

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

A2C Sharpe Ratio: 0.28170032118026406

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

Training time (PPO): 2.0821688890457155 minutes

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

PPO Sharpe Ratio: 0.28060463277315073

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

Training time (DDPG): 0.45194074312845867 minutes

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

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

previous\_total\_asset:1430114.6789980377

end\_total\_asset:1350454.3216031138

total\_reward:-79660.35739492392

total\_cost: 395.975832710042

total trades: 62

Sharpe: -0.0883669901335886

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

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

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

Training time (A2C): 0.6209092775980631 minutes

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

A2C Sharpe Ratio: -0.23595938131947466

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

Training time (PPO): 2.0786542097727456 minutes

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

PPO Sharpe Ratio: -0.0994299208590654

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

Training time (DDPG): 0.4447421232859294 minutes

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

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

previous\_total\_asset:1350454.3216031138

end\_total\_asset:1411650.0057063901

total\_reward:61195.68410327635

total\_cost: 338.9462411195659

total trades: 62

Sharpe: 0.11662737154309875

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

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

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

Training time (A2C): 0.6237426320711772 minutes

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

A2C Sharpe Ratio: -0.036211242553030085

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

Training time (PPO): 2.078665784994761 minutes

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

PPO Sharpe Ratio: -0.042883948013454944

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

Training time (DDPG): 0.45098878145217897 minutes

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

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

previous\_total\_asset:1411650.0057063901

end\_total\_asset:1563805.0905466396

total\_reward:152155.0848402495

total\_cost: 6.70004

total trades: 62

Sharpe: 0.360942054562919

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

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

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

Training time (A2C): 0.6221370259920757 minutes

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

A2C Sharpe Ratio: 0.24294756502783138

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

Training time (PPO): 2.069154318173726 minutes

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

PPO Sharpe Ratio: 0.25436120815402974

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

Training time (DDPG): 0.44081111749013263 minutes

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

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

previous\_total\_asset:1563805.0905466396

end\_total\_asset:1351961.5624224686

total\_reward:-211843.52812417108

total\_cost: 413.72459545451403

total trades: 62

Sharpe: -0.23769048489272254

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

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

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

Training time (A2C): 0.6190873543421428 minutes

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

A2C Sharpe Ratio: -0.29010577229753376

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

Training time (PPO): 2.0713061968485516 minutes

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

PPO Sharpe Ratio: -0.27386679506297

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

Training time (DDPG): 0.453578786055247 minutes

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

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

previous\_total\_asset:1351961.5624224686

end\_total\_asset:1592589.7682298473

total\_reward:240628.20580737875

total\_cost: 44.15573598812103

total trades: 62

Sharpe: 0.5375687311617147

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

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

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

Training time (A2C): 0.6182939052581787 minutes

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

A2C Sharpe Ratio: -0.14812419286115056

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

Training time (PPO): 2.050375457604726 minutes

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

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:126: RuntimeWarning: invalid value encountered in double\_scalars

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

PPO Sharpe Ratio: nan

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

Training time (DDPG): 0.4551533699035645 minutes

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

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

previous\_total\_asset:1592589.7682298473

end\_total\_asset:1813497.9954686146

total\_reward:220908.22723876731

total\_cost: 7.2124

total trades: 62

Sharpe: 0.4509024667751953

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

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

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

Training time (A2C): 0.6253710190455118 minutes

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

A2C Sharpe Ratio: 0.3730358665555832

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

Training time (PPO): 2.073533058166504 minutes

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

PPO Sharpe Ratio: 0.3766998042845107

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

Training time (DDPG): 0.45690323909123737 minutes

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

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:126: RuntimeWarning: invalid value encountered in double\_scalars

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

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

previous\_total\_asset:1813497.9954686146

end\_total\_asset:1686693.1275819184

total\_reward:-126804.86788669624

total\_cost: 756.8426735141753

total trades: 62

Sharpe: -0.21373454210597015

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

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

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

Training time (A2C): 0.6214805642763773 minutes

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

A2C Sharpe Ratio: -0.3046538577166101

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

Training time (PPO): 2.081452016035716 minutes

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

PPO Sharpe Ratio: -0.3500495319621751

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

Training time (DDPG): 0.4523819963137309 minutes

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

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

previous\_total\_asset:1686693.1275819184

end\_total\_asset:1796905.422042408

total\_reward:110212.29446048965

total\_cost: 613.1216531539749

total trades: 62

Sharpe: 0.33647645576110796

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

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

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

Training time (A2C): 0.6220918456713359 minutes

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

A2C Sharpe Ratio: 0.23059815739143982

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

Training time (PPO): 2.0574505647023518 minutes

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

PPO Sharpe Ratio: 0.21933566061704987

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

Training time (DDPG): 0.4438872774442037 minutes

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

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

previous\_total\_asset:1796905.422042408

end\_total\_asset:1048069.0028998131

total\_reward:-748836.4191425949

total\_cost: 428.359695935669

total trades: 62

Sharpe: -0.23892568807832082

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

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

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

Training time (A2C): 0.6224227150281271 minutes

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

A2C Sharpe Ratio: -0.2928571844175666

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

Training time (PPO): 2.0767006635665894 minutes

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

PPO Sharpe Ratio: -0.30377033243380636

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

Training time (DDPG): 0.4534664750099182 minutes

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

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

previous\_total\_asset:1048069.0028998131

end\_total\_asset:1375304.880601792

total\_reward:327235.8777019788

total\_cost: 0.0

total trades: 62

Sharpe: 0.23871710744514688

Ensemble Strategy took: 62.303128532568614 minutes

Process finished with exit code 0